

**AGENCY FOR
INTERNATIONAL
DEVELOPMENT**



**DEVELOPMENT ASSISTANCE PROGRAM
FY 1975**

TUNISIA

BEST AVAILABLE

**DEPARTMENT
OF
STATE**

JANUARY 1975



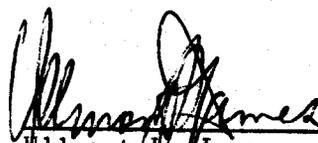
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UNITED STATES ECONOMIC
AND TECHNICAL ASSISTANCE
TO TUNISIA THROUGH
THE
AGENCY FOR INTERNATIONAL
DEVELOPMENT

DAF, PART I

December 1974



Wilmont L. James
Mission Director

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AMBASSADOR'S FOREWARD

Since Independence, the Government of Tunisia has demonstrated a remarkable perception of its development problems and a firm commitment to engage itself fully in their resolution. Although Tunisia's much larger neighbors to its East and West have posed, from time to time, a threat to its security, Tunisia has consistently deemphasized large expenditures on military hardware and concentrated its relatively scarce investment resources on economic development. Tunisia's financial position is much improved, but it is now at a stage where there is probably an even greater need than in the past for external technical assistance and technology transfer, precisely in those areas where the United States enjoys a lead. The United States and the Government of Tunisia are encouraging the U.S. private sector to increase its investment role in Tunisia. Nevertheless, AID programs in agriculture, health, and education will be important if the United States technology Tunisia so badly needs in those sectors is to be effectively applied.

Moreover, our continuing technical assistance role in Tunisia supports important U.S. political objectives as well. Tunisia has been a moderate, friendly voice in the Middle East and North Africa and has supported U.S. political objectives in this part of the world. To a successful degree, Tunisia has been able to balance its Western and European orientation vis-a-vis its role in the Arab world, and more limited role on the African Continent. Tunisia is also important to U.S. security interests in the Mediterranean region, serving as an important port of call for the United States Sixth Fleet on the southern littoral of the Mediterranean Sea. With respect to domestic policies, the United States has encouraged Tunisia's evolution toward a moderate, liberal and relatively open society, as well as the development of democratic institutions and processes. Our U.S. economic assistance programs have served the same objective with respect to Tunisia's economic institutions and policies.

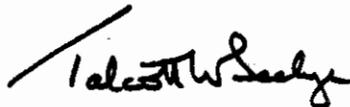
The United States bilateral assistance program is at its lowest level today since the inception of economic assistance following Independence. As this paper points out, however, a reduction of financial aid is justifiable in the context of Tunisia's favorable growth in recent years. As long as the current favorable conjuncture of economic circumstances obtains, Tunisia needs less financial assistance, but the technical assistance which A.I.D. can provide to help overcome its critical development constraints in certain key sectors will make an important contribution to Tunisia's attainment of sustained growth in the future. Phaseout of our assistance role is not a recommended course at this time, for a mix of economic and political reasons highlighted in this paper. Some steps in the direction

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of less concessional aid, and less direct USAID management of assistance inputs, however, are appropriate and timely, and will be explored with the Government of Tunisia as we proceed to implement our aid strategy.

For the above reasons, and because the presence of a U.S. economic assistance program in Tunisia is, in our view, a political imperative, I urge the continuation of this program at approximately current modest levels, but with a gradual reduction of concessional terms.



Talcott W. Seelye
Ambassador

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I. INTRODUCTION

This paper presents, in summary form, a statement on (1) current Tunisian economic growth and future prospects, (2) sectoral development and principal constraints in agriculture, health and education, and (3) USAID's recommended AID assistance strategy in Tunisia over the next three to five years. The paper is not a complete analysis of the sectors chosen for examination. Within the time available for the review, the USAID has attempted to draw upon existing data and formulate, in general terms, an AID strategy in conformance with our best current assessment of Tunisia's present stage of economic development and prospects for the future.

Part II reviews overall economic growth in Tunisia, GOT development priorities and the financing of Tunisia's development programs. The assessment concludes that barring an unusual succession of bad crop years, or unexpectedly abrupt fall in price of major exports, Tunisia appears able to meet its financial resource needs, over the short to medium term, through its own production and exports, through already programmed and anticipated commitments of concessional foreign assistance, and through non-concessional financing (loans and investment). In terms of external needs, Tunisia's future economic growth depends on the extent to which the recent favorable turn in the terms of trade continues and, most importantly, on the magnitude of future petroleum exports.

Part III contains brief summary statements with respect to agriculture, health, and education, backed up by more detailed assessments attached as annexes to the paper. In all three cases, it can generally be concluded that while Tunisia may have adequate resources and programmed concessional aid to finance sectoral development activities, effective mobilization of these resources for optimal use requires, to a large extent, application of improved technology, changed management practices, policy and institutional changes and manpower training. These are areas in which the U.S. has a unique role to play.

Part IV outlines a recommended U.S. bilateral assistance strategy applicable for the balance of Tunisia's second development decade (1972-1981). U.S. financial assistance no longer appears required to meet Tunisia's external resource requirements or finance its investment budget. The USAID recommends, however, limited technical grants and project lending in areas which help Tunisia adapt existing technology and make other critical institutional reforms, particularly as they relate to the distribution of the benefits of growth, among different income groups and among different regions of the country.

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The USAID recommends technical assistance grants and loans averaging \$3 to \$5 million annually, limited PL 480 Title II commodity assistance, and occasional PL 480 Title I sales (primarily soybean oil). A continuation of this limited program over a three to five year period is recommended, while gradually phasing over on a selective basis to less concessional assistance modes through technical assistance loans, and less U.S. direct management of assistance inputs by experimenting with bloc grants. These steps should set the stage for a significant reduction in AID financial and manpower inputs to Tunisia by FY 1980, while permitting a continued U.S. bilateral technical assistance role in the interim.

This paper confines its analysis to the agricultural, health, and manpower sectors. The Tunisian Government is also attaching great importance to the transfer of technology and management skills in the industrial sector, and to encouraging private foreign investment in this area. The USG is, therefore, encouraging alternatives to U.S. bilateral aid to support Tunisia's industrial investment, such as assistance through OPIC, the Export-Import Bank, and investment promotion programs with U.S. businessmen interested in Tunisia.

Finally, the sectoral reviews leading up to this DAP were carried out in collaboration with the Government of Tunisia and a few non-governmental Tunisian organizations. During November and December, 1974, the GOT Ministries of Foreign Affairs, Plan, the technical ministries concerned, and organizations such as the Tunisian National Women's Union (UNFT) provided relevant data and granted interviews to USAID and TDY specialists who assisted in the preparation of the document. Sectoral discussions were held with GOT and USAID representation, under the chairmanship of the Ministry of Foreign Affairs, to discuss major constraints and problems in these economic sectors. The GOT has indicated to the USAID a desire to supplement the sectoral statements contained herein with statements of the Tunisian Government's own perception of its development problems and priorities. Hopefully, this material will be available early in CY 1975.

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II. Development Overview

A. Development Progress

1. Economic Growth

Real GDP has grown at an average annual rate of more than 6% over the last 12 years. Hidden in this average are wide swings, with annual growth rates ranging from 17.7% to a negative 0.7% and only three instances of growth rates for consecutive years being within 2 percentage points of each other. Hence, the experience of the past 3 years, when the growth rate went from 17.7% in 1972 to 1.2% in 1973 to an estimated 10.9% in 1974, is, while extreme, consistent with the general pattern of Tunisian development.

GOT policies have been a factor in the uneven economic performance, contributing to both successes and failures. The experience of the cooperative movement in agriculture in the late 1960's and that following its dissolution are well-known examples.

However, the primary factors producing a saw-tooth growth pattern have been structural. A number of major components of economic output are very sensitive to influences outside the control of either the Tunisian Government or the domestic private sector.

That ideal weather conditions played a key role in high growth rates in 1971 and 1972 is clear from a comparison of agricultural output in those years and in 1973. Agricultural output increased by 24.1% in 1971 and 29.8% in 1972 but, without major changes in policy influences on the sector, fell by some 17% in 1973 as a result of floods in the spring and drought in early summer of that year. Although even in a good year like 1972 agriculture only contributes one-fifth of GDP, fluctuations of such an order of magnitude * create sizable waves in the pattern of overall economic output, even without taking into account their secondary and subsequent effects.

Some of these secondary effects can be seen in the manufacturing sector, for example, where between one-third and two-fifths of the sector's contribution to GDP comes from agriculture and food industries. Hence, supplied by bumper crops in 1971 and 1972, the value added by these industries spurted by 42.3% and 37.3% respectively those years but contracted by 23% in 1973 in response almost exclusively to the bad crop year for olives. (The shortfall in domestic cereals production was made up by imports and had no effect on the milling industry).

* They have appeared as well in periods of generally bad performance; e.g., -14.4% in 1967; +29.9% in 1968; -18.7% in 1969.

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Similar structural dependency on external factors exists in non-agricultural sectors as well, particularly in tourism, which accounts for 3-4% of GDP. Among the outside influences on the health of this sector are general economic conditions in countries from which tourists come; exchange rate shifts in these countries or those which compete with Tunisia; the political situation in neighboring and/or competing countries; changes in international transportation costs; and even weather conditions and outbreaks of disease in Tunisia.

In spite of the variations in growth and the continuing dependence of the economy on uncertain climatic conditions, the general progress of the Tunisian economy since 1971 has been truly impressive and exceeds the performance of most developing countries. Not only has real domestic product for this period increased at an annual rate of close to ten per cent, but the level of national production going into investment has remained high, foreign exchange reserves have increased substantially while the relative importance of foreign indebtedness has decreased, thereby substantially improving Tunisia's ability to attract foreign private investment and obtain additional foreign loans and commercial credits. The remarkable increase in the price of Tunisia's crude oil and phosphate exports, which coincides with this improved economic performance, will help assure a continuing flow of resources to help further general economic growth. In addition, production of both petroleum and phosphates are expected to increase substantially in the next few years while Tunisia will also increase the return to its economy from these two resources by increasing the amount processed locally into higher value exports. Expanded manufacturing, particularly through foreign investment, will help offset a stagnant tourism sector and problems in increasing agricultural production.

2. External Sector

Tunisia's net reserves at the end of 1969 represented only two weeks worth of imports. Two years later they represented over four months of imports. The ratio continued to improve, reaching 6 months at the end of 1973. Moreover, this improvement took place at the same time that imports were growing at an average annual rate of over 18%. Although reserves continued to increase during 1974, the cost of imports grew faster, so that the ratio is estimated to have declined to about 5 1/2 months by the end of 1974.

Net capital inflows were fairly constant, averaging about \$100 million over the past 5 years. (In fact, in 1970 and 1972 there were drops in the level of such flows.) The improvement in the foreign reserve position was due, therefore, to rapid growth of exports of goods and of services, each of which more than doubled between 1969 and 1973.

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a. Goods Exports

For goods exports, however, the overall picture of steady growth is the result of a sufficiently diversified export sector which can mask dramatic fluctuations for particular items. Over the past three years, only the textile industry showed steady growth both in the quantity and value of its exports, increasing as a consequence its share in total goods exports from 2.0% in 1970 to 6.2% in 1973. Significant changes in other export categories have been largely a function of climatic conditions and movements in world commodity prices. The exploitation of new oil fields thus far has served to avoid the decline in volume of crude exports that otherwise would have occurred. A substantial increase in the volume of net crude exports will, however, begin in 1975. Expanded phosphate production is also expected by 1976.

In 1971, it was recovery of the olive crop from a disastrous prior year (260% greater than 1970) and a 30% hike in crude oil prices that produced the overall 18% increase in export receipts. In 1972, olive production experienced a phenomenal doubling from the already high 1971 level. This factor alone accounted for over half of the 35% increase in exports that year. The majority of the remainder represented a one-time increase in petroleum exports (offset by an increase in imports) resulting from changeover to supply of the local refinery from imported rather than domestic crude. In 1973, the October jump in crude oil prices was the principal factor enabling overall exports to show a 12% increase (in Dinars) despite a sharp drop in olive oil exports.

The present estimate of an 87% increase in exports during 1974, is, except for recovery of olive production, predicated almost entirely upon price increases -- 42% in the case of olive oil; 287% for phosphate rock; 85% for super triple phosphate; 100% for phosphoric acid; and 164% for petroleum. Petroleum exports alone are projected to amount to more than the sum of all exports in 1971 despite the fact that the volume of petroleum exports is not significantly greater than it was in that year.

b. Services Exports

In recent years, receipts from exports of services (including worker remittances) have been nearly as large as exports of goods, and, indeed, in 1971 exports of services exceeded those of goods. This ratio is projected to drop sharply in 1974 and in subsequent years, however, as a result of a spectacular jump in the value of goods exports and relative stagnation in earnings from tourism and workers remittances, the two principal components of the services account.

In 1973, the increase in tourism receipts slowed to only 7% as compared to an average annual increase of 38% during the previous three years. This slowdown was attributable in part to the worldwide realignment of currencies, which had the effect of making Tunisia more

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expensive relative to some of its competitors. A second important factor during the last quarter of the year was the large increase in transportation costs brought about by the increase in petroleum prices. For the same reasons, 1974 is not expected to show any increase in tourism receipts despite the diversion of large numbers of tourists from the eastern Mediterranean to Tunisia after the outbreak of fighting in Cyprus.

From 1969 to 1973, remittances from Tunisian workers overseas grew at an even more rapid rate than did tourism receipts. Increasing at an average annual rate of 42%, workers became the third most valuable "export" in 1973, trailing only tourism and petroleum as a source of exchange earnings. The economic slow-down in Europe, which has caused several countries to put a freeze on the entry of additional foreign workers, will have an uncertain impact on remittances. For 1974, it is expected only to reduce the rate of growth of remittances. However, should the economic situation in Europe persist and deteriorate to the point where large numbers of workers return to Tunisia, there could be a large one-time increase in remittances as the workers repatriate with them the savings they have held in Europe.

c. Imports

Many of the same price factors that are contributing to the expected 87% growth in the value of goods exports in 1974 are inflating Tunisia's import costs and significantly reduce the "real" level of the estimated 53% increase in imports. More than 43% of the entire import increase is attributable to only six commodities. Wheat imports are expected to be 73% -- 15% in volume plus a 50% price increase. Vegetable oil imports are slated to rise 75% -- 35% in volume and 30% in price. Sugar imports are to increase 167% -- 30% in volume and 120 - 185% in price. Due to a quadrupling of the price, imports of crude petroleum for the Bizerte refinery are to grow more than 150%, despite a projected 36% drop in volume.* Fertilizer imports are expected to be up more than 140%, reflecting an increase of 40% in volume and 72% in price. Hydraulic cement imports will be up 270% as a result of increases of 164% in Volume and 40% in price.

As can be seen from the above listing, a significant part of the benefits Tunisia is reaping on the export side of the ledger is being taken away on the import side. The price advantage for olive oil exports becomes an additional cost for imports of soya oil that is a replacement of olive oil for domestic consumption. A part of the price gain on petroleum exports becomes a loss on imports, albeit a much smaller quantity, of a different type of crude used in the domestic refinery. The price increase for fertilizer is a plus for exports of phosphates but a minus for imports, again of a decidedly lesser amount, of nitrogenous fertilizers.

*This decrease implies a return to use of some domestic crude for the refinery and a lower export level than would have occurred if the past practice of feeding the refinery almost exclusively with imported crude were continued. If allowance is made for this shift, the amount of the increase in imports attributable to the 6 listed commodities is further increased.

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Consequently, Tunisia, which had virtually eliminated its current account deficit in 1971 and 1972 only to see it return almost to past levels in 1973, will again experience such a deficit in 1974, despite the large increase in exports. If the government can restrain imports of consumer goods, concentrate on investment goods, and continue to attract foreign capital on reasonable terms, this current account deficit should not be viewed with alarm.

d. Capital Account

As noted earlier, net capital inflows have not grown rapidly over the past five years. They amounted to TD 55 million * in 1973 and are expected to have maintained the same level in 1974. This is below the peak levels of the mid-1960's, and represents a markedly reduced relationship to imports of goods and services -- 14% in 1973 and 10% in 1974 as compared to 34% in 1965.

Disbursements on loans from official sources jumped from TD 31 million in 1970 to TD 45 million in 1971, but there has been little increase since then. The amount is estimated to have been TD 49 million in 1974, the same as in 1973. Disbursements on loans from private sources remained steady at about TD 20 million annually from 1969-1972 but dropped to TD 15 million in 1973 and 1974.

Repayments on the external debt amounted to about TD 25 million annually 1969-1971. They then jumped to TD 35 million in 1972, largely as a result of an increase in private debt repayments, which amounted to two-thirds of the total in that year. However, despite a steady increase in principal repayments on official loans, total repayments dropped back to TD 31 million in 1973 and an estimated TD 33 million in 1974.

Foreign investment has grown rapidly from TD 10 million annually in 1969 and 1970 to TD 25 million in 1973 and about the same amount in 1974. Consequently, it now accounts for nearly half of net capital inflows. Virtually all of the new investment recorded in the balance of payments has been attributed by the Ministry of Plan to the petroleum sector, despite the evident success of GOT efforts to attract foreign investment in manufacturing.

e. Projections 1975-76

GOT projections incorporated in the annual plan ("Budget Economique") for 1975 indicate current account deficits of TD 48.8 million for 1975 and TD 56.6 million for 1976.

*Official Tunisian balance of payments series are available only denominated in dinars. The "trade conversion factor" utilized in the IMF's "International Financial Statistics" is .525 dinars per U.S. dollar through 1970; .484 for 1972; .439 for 1973; .435 through July 1974.

.521 for 1971

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(1) Exports

For goods exports, the GOT projections represent an increase of 7.5% in 1975 and 11.1% in 1976. The 1975 increase is largely a function of the full-year effect of price increases for phosphates that occurred during 1974 and of expectations of rapid growth in textile exports. On the other hand, decreases in both volume and price are indicated for olive oil. The 1976 increase is to come chiefly from recovery in the volume of olive oil exports, massive further growth in textile exports, and the beginning of exports in large quantity of metal extrusions.

However, the key to the export picture (and one about which there is some uncertainty) is the outlook for production of petroleum, which now represents one-third of the value of goods exports. The Ministry of Plan has estimated an increase in petroleum exports from 3.265 million M.T. in 1974 to 3.800 million M.T. in 1975 but no further increase in 1976. In the light of the GOT's projections for domestic crude production, such a pattern for exports implies continuation in 1975 of the decrease in crude imports that took place in 1974 and elimination of all such imports in 1976. Such a premise is not, however, explicitly given.

Moreover, the Ministry's estimates of future crude production are significantly lower than those prepared by the U.S. Embassy on the basis of information received from the petroleum companies. The difference between the two estimates amounts to about 500,000 M.T. for 1975 and 1.25 million M.T. for 1976.* At the TD 32.8 per M.T. price utilized in the GOT projections, this amount of additional production, if achieved, would increase the value of exports (and decrease the current account deficit) by TD 16.4 million in 1975 and TD 41 million in 1976.

For services exports, the GOT projections show modest growth of TD 12 million (6.5%) for 1975 and TD 10 million (5.1%) for 1976. The increases are spread over all the major categories - tourism, worker remittances, transportation, etc.

(2) Imports

Projected imports of goods represent an increase of 15% in 1975 and 10% (or 12%, depending on which of two differing GOT figures is utilized) for 1976. For 1975, the price assumptions are an increase of 10% for capital goods, an increase of 5% for semi-finished goods and no increases for other categories; i.e., raw materials and consumer goods.

*Statements by some GOT officials, however, have indicated a higher figure for 1976, which would reduce the difference to about 800,000 M.T.

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The increases of TD 8 million (7%) for 1975 and TD 7 million (5.7%) for 1976 relating to expenditures on non-goods-related services reflect increases in interest and dividend payments.

(3) Capital Account

GOT projections show a slight decline in net capital flows in 1975 (to TD 53.8 million) followed by a small increase to TD 57.6 million in 1976. Loan repayments are scheduled to grow gradually, as payments on private loans remain at about TD 18 million while those on official loans grow steadily and come to account for more than half of the total.

Disbursements on official loans are projected to increase only slightly (to TD 51.5 million) in 1975 but jump to TD 65 million in 1976. Inasmuch as the estimated undisbursed balance on already contracted loans amounts to only about TD 100 million, disbursements amounting to at least TD 15 million from loans yet to be contracted are implied.

Disbursements on private loans have been projected to continue in 1975 and 1976 at about the TD 15 million level of the past two years. A substantial part of these loans represent the private component of "mixed" loans provided by France.

Net foreign investment is projected to begin to decline - to TD 23 million in 1975 and TD 18 million in 1976. Such a development, however, appears inconsistent with Ministry of Plan projections for increased investment in petroleum (which has absorbed most of foreign investment up to now) and in manufacturing, both of which can be expected to involve substantial private foreign investment.

f. Debt Burden

Tunisia's outstanding foreign debt has grown steadily, reaching an estimated TD 455.4 million in 1974 and projected to increase to TD 488.2 million in 1975 and TD 529.8 million in 1976. However, the ratio of such debt to GDI has declined from 44% in 1969 to 34% in 1974 and is expected to fall somewhat more over the next two years.

The share of the debt owed to private lenders has declined steadily from over half in the early 1960's to less than 20% in 1974, and it is expected to continue to fall.

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Debt service payments-principal and interest - have remained fairly level over the past three years. As a result, therefore, of the rapid growth of exports, the debt service ratio has dropped off sharply. As a percentage of exports of goods and services, it went from 15.6% in 1972 to 12.6% in 1973 and 9.2% in 1974. GOT projections indicate no further declines.

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3. Employment

The last census was taken in 1966, making it difficult to establish the present employment situation with any degree of precision. As a base for preparation of the Fourth Plan, the GOT estimated that in 1972 the number of people employed was about 1.4 million and that the number unemployed was about 130,000.

However, of the 1,047,000 men counted as employed, only 713,000 has permanent jobs, and the remaining 334,000 (one-third of the total) were seasonal workers. Although not specifically identified as such, nearly all of the 250,000 women working in agriculture must also be counted as seasonal workers. Consequently the 713,000 men (300,000 of them in agriculture) and 92,000 women (34,000 working in textile handicrafts, 15,000 domestics, and 43,000 in industry and other services) who were considered to have permanent employment constituted less than half of the labor force.

The situation appears somewhat better if seasonal female agricultural workers are excluded from the labor force on the assumption that they enter it only because of a shortage of family labor at times of peak demand in the crop cycle. In this case, the proportion of permanently employed workers to the labor force rises to about two-thirds. However, this assumption is not entirely valid, nor is the assumption (utilized in the Plan calculations) that there are no women in the labor force without any employment; i.e. the female labor force is arbitrarily defined as made up of these women who have jobs.

Apart from seasonal employment, there is a considerable amount of underemployment even among those who are considered to have permanent jobs. This is particularly true in the agricultural sector, where, for example, it has been estimated* that there is underemployment of nearly 50% in the livestock sub-sector simply by virtue of the fact that those engaged in caring for animals could care for 2-3 times as many without devoting any more time to the task. It is also true in commerce and several other service activities, including government.

The Fourth Plan projected an increase in the labor force of 198,000 over the Four-Year period 1973-76. Of this total, 45,000 are expected to be women, on the basis of the assumption that 20% of working age females not in school will seek jobs as compared to only 10% in the past.

In spite of the major emphasis given to job-creation in the Plan, it was estimated that only 118,700 new jobs would be available in

* L'Emploi Agricole en Tunisie, Analyse Régionale", published by the Ministry of Plan as document PNUD/BIT/TUN 71/545 under the UNDP/ILO Employment Planning project.

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1976 to meet the demand for 198,000, leaving a gap of 79,000. Despite projected emigration of about 60,000, the level of unemployment would actually be greater by 19,000 at the end of the Plan period than at its beginning.

Of the 118,700 jobs to be created, 29,000 were to be for women, 19,000 in manufacturing and 10,000 in services. Thus, the additional demand would be satisfied somewhat more in the case of women (65%) than in that of men (55%). It must be remembered, however, that the demand for jobs by women in present circumstances in Tunisia is determined to a large degree by the availability of jobs.

None of the increase in the number of jobs available was to occur in the agricultural sector despite a projected 11% increase in the demand for labor. This increased demand was to be reflected instead in a reduction in the level of underemployment, as some 10,000 seasonal workers were converted into permanent workers. This transformation, of course, would have a positive impact on incomes without appearing directly in overall employment data.

A third of the new jobs to be created during the Plan period were to be in the manufacturing sector. Nearly half of these were to be for women, particularly in the textile industry, which was to account for 65% of job creation in manufacturing.

Construction was expected to provide 19,000 new jobs, all for men. Services were to account for the remaining half (60,000), one-fifth of them for women.

The Tunisian Government attaches priority importance to increased employment both as a means of increasing total output and assuring a better distribution of income to deprived elements of the population. To achieve this, the government plans to expand the industrial sector of the economy with great emphasis on attracting private capital, both domestic and foreign, for industries producing only for export under the very advantageous conditions created by the Investment Promotion Law of April 1972, as well as for industries serving the domestic market under fiscal advantages in the new Investment Code of August 1974.

At the end of 1974, half-way through the Plan period, the GOT estimated that employment targets are being surpassed. About 31,500 jobs were created in 1973 and 40,000 in 1974, as compared to targets of 26,000 and 32,000. This total excess of 13,500 was achieved despite practically no growth in the tourism industry, which had been counted on for 4,000 new jobs annually. On the other hand, targets for export industries were exceeded, especially benefiting women.

Particularly offsetting the extra jobs created, however, is a

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shortfall of some 5,000 in the number of young people in secondary and higher education, who are presumed to have joined that labor force.

The net result is that the total number of people added to the labor force during the two years exceeded the number of new jobs created by 33,500. Emigration absorbed 28,000 of these -- 19,000 in 1973 and 9,000 in 1974 -- leaving 5,500 to join the ranks of the unemployed.

4. Development Outlook

Except for a pause in 1973, Tunisia has experienced rapid economic growth over the past 5 years and, with reasonable weather, this growth should continue for at least the next 2 years. Remarkable improvement in the balance of payments situation has been both cause and effect of that growth; but a very favorable shift in the terms of trade over the past 18 months has been an even more important factor in the improved balance of payments picture and short-term outlook. As a result, for the first time since Independence the inadequacy of foreign exchange and local currency has been removed as a constraint to investment.

As have other countries, Tunisia has recognized that growth will not solve the underlying human problems of development - unemployment and poverty. One must look at the nature of the growth and put it actively to work on the solution of those problems.

Agriculture, which has provided much of the impetus for recent growth, has already achieved most of the "easy" gains open to it - record crops derived from ideal weather conditions; restoration of private confidence and initiative damaged during the cooperativization period; and record world prices for its major agricultural export commodity. Future gains will be hard-won, requiring that difficult and complex structural and human resource problems be overcome and perhaps serving only to offset setbacks derived from poorer weather conditions and falling world prices.

Agriculture which already occupies nearly half the labor force to produce less than one-fifth of the nation's output, cannot be and is not - expected to make a positive contribution to solution of the employment problem. Some improved cultural practices and greater utilization of available water and existing irrigation facilities will require greater labor input, but this increase will serve mainly to reduce the degree of underemployment of those now employed. And some changes, such as mechanization of plowing and cereals harvesting, which may be necessary to improve productivity and the incomes even of small farmers, involve dramatic reduction in labor input.

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The services sector is largely a passive element in the economy. The performance of its major components, such as commerce and transport, depends upon that of the other sectors. Services, including government, have provided a major share of the additional jobs created during the past decade, but the nature of these jobs is such as to conceal a high degree of underemployment.

Tourism is one element of the services sector that is largely autonomous of the rest of the economy. Until last year it had made, and was counted upon increasingly to make, a significant contribution to job creation and foreign exchange earnings. However, the oil crisis and economic recession in Europe have put the short-medium term future of the tourism industry in doubt. Nevertheless, over the longer run, tourism must be considered one of the positive elements in Tunisia's future.

Manufacturing has been, and is intended to be, an increasingly dynamic and positive element in both economic growth and employment creation. However, leaving aside the food-processing subsector, which is dependent upon results in agriculture, the remainder of the manufacturing sector is starting from a small base, and even strikingly large percentage jumps translate into a quite small percentage of national production and employment. Nevertheless, manufacturing should attract increasing amounts of private capital, domestic and foreign, and contribute significantly to new employment. The combination of Tunisia's small population, per capita income of \$450 and the fact that a fairly large portion of the population are not active participants in the market economy, results in a small - and for many industries a limiting - domestic market. Like others in a similar situation, Tunisia is seeking to overcome this limitation by promoting export industries. However, the tax and foreign exchange benefits accorded in an effort to compete with other countries means that the economic benefits to Tunisia, other than jobs, are quite limited. In 1973 and through the first half of 1974, the newly formed Investment Promotion Agency registered TD 225 million of planned new industrial investment, of which TD 89 million is to go into export industries. The implementation of many of these projects over the next few years should add considerably to manufacturing production.

The extractive industries, essentially phosphates and petroleum, currently constitute the boom sector of the Tunisian economy. However, the phosphate industry, which only a couple of years ago required a government subsidy, is now operating at a profit only because of the surge in the world price. Although the price can be expected to begin to recede within the next 2-3 years, phosphates will remain important, and production is to be expanded from 4 million MT in 1974 to 5 3/4 million MT in 1978 by opening new mines and improved production methods. Furthermore, the development of phosphoric acid and new fertilizer plants, now underway, promises significant long term benefits, in terms of greater value added, higher export earnings, and greater employment, from phosphates.

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Petroleum remains the one major factor that offers the possibility of providing at least the financial means for solving Tunisia's long-term development problems. While directly providing few jobs, petroleum production at the level that appears possible within a few years should, if the price remains at or near present levels, provide foreign exchange and budget revenue needed for job creation. For instance, construction, which is highly labor intensive, could be expanded greatly, particularly once completion of new cement plants eliminates a bottleneck in that area. However, the magnitude of Tunisia's petroleum resources and the timing of their availability after the next couple of years is uncertain. Offshore oil discoveries which must still be developed as well as reserves still to be explored remain beyond the reach of present planning.

B. GOT Development Priorities

After having examined critically the results of its First Development Decade (1962-71), the GOT defined a development strategy and global objectives for a Second Development Decade covering the period 1972-81. This strategy is to be implemented in the course of the current Fourth Development Plan (1973-76) and a subsequent Fifth Plan, for which preparations are already about to begin.

The economic growth target for the decade is an average annual growth rate of real GDP of 7.6 percent, or nearly double the 4 percent rate achieved during the previous decade. It is to be achieved progressively so that the rate for the Fourth Plan would be 6.6% and that for the Fifth Plan would be 8.5%. This rapid growth rate was considered essential to be able to adequately address the country's central development challenge -- the inter-related problems of employment creation and a fairer redistribution of revenue at the level of individuals and of regions.

In order to achieve the targeted growth rate, an investment rate at least equal to the already high 23% of GDP achieved during the First Development Decade was set. At the same time, the share of investment financed from abroad is to be reduced from the 40% experienced during the First Decade to 25% for the Fourth Plan and 20% for the Second Decade as a whole.

In addition, two investment policy changes, already initiated in 1969 and 1970, were incorporated into the strategy with the intent of increasing the productivity of investment. The first of these is the greater emphasis to be given to directly productive investment as compared to infrastructure. The relative shares of the two are to be reversed, with that of directly productive investment increasing from one-third during the First Decade to two-thirds during the Second. The second policy change relates to the increased role assigned to the private sector, whose share in total investment is to grow from 28% to 40%. (The change is particularly marked in the

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agricultural sector, where the private sector share is to increase from 15% to 40%).

The employment problem, which is assigned the highest priority in Tunisia's development strategy, is to be attacked in three ways:

- acceleration of economic growth;
- reduction of population growth; and
- adaptation of the educational system to respond to the needs of the economic system.

Even with allowance made for some success in reducing population growth, it is estimated that there will be a demand for 500,000 new jobs during the decade or 50,000 per year, as compared to the number of 15,000 per year created during the First Decade. It is expected that employment creation in the agricultural sector will serve only to reduce underemployment. Therefore, achievement of the target of 350,000 additional jobs outside agriculture would still result in substantial continued emigration and/or increased unemployment.

The objective of increasing incomes of the 40% of Tunisians whose incomes were judged still to be below the poverty threshold * at the end of the First Development Decade (compared to 75% at the beginning of the Decade), is being addressed through special development programs for the less favored regions, as well as through national policies relating to salaries, social security, employment, taxation, and pricing of basic necessities. Rural development programs, for which 40 million dinars are allocated under the Fourth Plan, are to be decentralized and put in the hands of regional authorities.

Finally, while not established as a specific objective in either the strategy for the Second Development Decade or in the Fourth Plan, the goal of self-sufficiency in food production has been receiving increasing emphasis from government officials, particularly since the on-set of the world food crisis of the past year or so. It seems likely that such a goal will be incorporated in the Fifth Plan. In the cereals sub-sector, in fact, GOT officials anticipate reestablishing Tunisia as a hard wheat exporter during the coming decade.

* defined as per capita annual income of TD 70, including social benefits received from the State valued at TD 20.

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C. Financing of Development Programs

1. Savings and Investment

a. Savings

All of the increase in gross domestic product in 1969 and 1970 was absorbed by consumption, so that gross domestic savings stagnated and their ratio to GDP declined from 19.1% in 1968 to 15.7% in 1970. Rapid growth of GDP resulted in increases in savings of 41% in 1971 and 26% in 1972, despite an 18.5% jump in consumption in the latter year. As a consequence, the ratio of savings to GDP increased to 19% in 1971 and then 20.7% in 1972. Economic stagnation in 1973 brought a small decline in savings and in the savings ratio (to 19.1%). However, the sharp rebound of the economy in 1974 is estimated to have permitted sharp increases both for consumption (15%) and savings (46%), bringing the savings ratio up to 22.7%. The ratio is projected to remain at about the same level in 1975, but the GOT forecasts for 1976 an inexplicably high increase in private consumption with a consequent decline in savings.

As a result of the generally rapid increase of savings in recent years, the portion of Tunisia's gross capital formation (gross fixed investment plus variations in inventories) that is covered by gross national savings rose from about two-thirds in the 1968-1970 period to about 90% in the years 1971-1974 (except for a dip to 84% in 1973). This ratio, however, is projected by the GOT to decline to about 80% for the next two years, as investment grows more rapidly than savings.

b. Investment

Throughout the past decade, Tunisia has consistently had a high investment rate. Since 1963, the ratio of gross fixed investment to gross domestic product dropped below 20% only in 1970 (19.6%) and 1972 (18.8%). The ratio is estimated to have been 24.1% in 1974 and is projected by the GOT to reach 26.7% in 1975 and 24.8% in 1976. High as those rates appear, they are no higher than those attained in the mid-1960's but are now based less on foreign financing. It should be kept in mind, nevertheless that the prices of investment goods with their high import component are rising faster than those for the economy as a whole, and this is an important factor in the growth of the investment share of expenditures.

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(1) Sectoral Distribution

The share of the agricultural sector in total investment, which amounted to 18.8% for the decade 1962-71 as a whole, had fallen to about 12% in the last year of that period. It has remained between 12% and 13% since then and is projected to continue at about 12% in 1975. Agricultural investment is lagging behind levels projected in the Four-year Plan, however, due to short-falls in public sector investment in the hydraulic and livestock areas.

Investment in manufacturing industries amounted to about 12% of total investment from 1962-71. Following a decline to 10.4% in 1972, there has been a steady increase in the percentage to 13.4% in 1973, 16.7% in 1974 and a projected 18.6% in 1975.

Investment in transportation and communications has followed an irregular pattern. It constituted 12% of total investment for the decade 1962-1971 but jumped to 20% in its last year. Following a drop to 14.5% in 1974, the share rose to about 18% in 1973 and 1974, and is expected to decline to 16% in 1975.

The share of housing in total investment has followed a generally downward trend in recent years, falling from 15.6% in 1970 to 11.5% in 1974. For 1975, it is projected to maintain about the same percentage, which is slightly below the average for the period 1962-1971.

Petroleum investment represented 9% of total investment during the period 1962-1971 (6-7% in the last 3 years of the period) but jumped to 11-12% during the past 3 years and is expected to increase slightly its share in 1975. Investment in oil and gas exploration and development and related activities, such as construction of the Tunisian portion of the Algerian-Italian gas pipeline should insure future growth.

Tourism, which absorbed 8% of investment from 1962-1971 and increased that share to 12% in 1972 and 11% in 1973, received only an estimated 4.9% in 1974 and is projected to receive but 2.4% in 1975.

(2) Public Investment

The share of the public sector has decreased markedly over the past decade. In 1965, 82% of all investment was carried out by the public sector. By 1970, this share had fallen to 65%, as public sector investment declined even in absolute terms (by 12%) and private sector investment, which had stagnated throughout the first half of the 1960's,

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doubled during the last 4 years of the decade. Public sector investment grew in absolute terms in 1971 and 1972 but fell again in 1973, when its share of total investment was barely over half. In 1974, a 50% increase in public sector investment brought its share in total investment up to 56.5%, and the share is projected to increase slightly in 1975.

Public enterprises increased their share in public investment from 43-44% in 1968-1969 to 64% in 1971-1972. This share declined in 1973, however, and is estimated to have fallen further to the neighborhood of 60% in 1974, as a result of a 60% increase in investment by the non-enterprise government sector ("administration") whose investment had generally stagnated during the previous 4 years at a level (TD 43-47 million) well below its peak of TD 55 million in 1969.

The largest share of public investment expenditures is devoted to transportation and communications - 35% in 1973, an estimated 32% in 1974, and a projected 27% in 1975. Other public utilities (water and power) absorb the next largest share - 16% in 1973, 14% in 1974, and 14% in 1975. Manufacturing enterprises account for 11-12% of public investment in each of the 3 years.

Investment in mining and petroleum is growing rapidly with the result that their share in public investment jumped from 4.8% in 1973 to 8.1% in 1974 and is expected to increase to 10.9% in 1975.

Agriculture is accorded about 10% of public sector investments in each of the 3 years 1973-1975. If public enterprises are excluded from the picture, however, the agricultural share of public "administration" investment is about 20%. An additional 10% of administration investment (3 1/2 - 4% of total public investment) goes to "rural development".

The share of education in administration investment is estimated to have dropped from 16.7% in 1973 to 11.7% in 1974 (and from 6.4% of total public investment to 4.7%), but it is projected to rise to 13.6% in 1975. Administration investment in the health sector more than doubled from 1973 to 1974, increasing the sector's share from 5.2% to 6.9%, and a further increase to 9% is projected for 1975.

(3) Private Investment

The most striking elements of recent private sector investment have been the rapid increase in the manufacturing sector and the even more rapid decrease in the tourism sector. Manufacturing investment is estimated to have doubled in 1974 and is expected to increase by a third again in 1975. It would then overtake housing as the principal recipient of private investment and would account for more than a quarter of the total.

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On the other hand, private investment in tourism facilities, which in the face of stagnating demand are overbuilt, dropped by half in 1974 and in 1975 is expected to be reduced to less than one-seventh of its 1973 level, constituting only 3.2% of total private investment, as compared to 24% in 1973.

Private (foreign) investment in petroleum is growing rapidly and is projected to increase its share in total private investment from one-fifth in 1973 to more than one-fourth in 1975. Investment in housing and in agriculture are expected to grow at about the same rate as total private investment, maintaining their share at about 26% and 16% respectively.

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2. Public Finance

a. Current Account

The budgetary situation continued to improve during the past 3 years, and current account savings jumped from TD 44 million in 1972 and TD 49 million in 1973 to an estimated TD 96 million in 1974, when they amounted to almost one quarter of total revenue.

The growth occurred despite increases in current expenditures of 17% in 1973 and 24% in 1974. About half the expenditure increase in each of these years was due to higher salary payments, and much of the remainder was due to growing subsidy payments to public enterprises and the private sector.

Current receipts grew by 15.6% in 1973 and 36% in 1974, with more than half of the increase in the latter year attributed to profits from petroleum operations. (Adding in taxes on the petroleum companies, income from the petroleum industry constituted about 20% of all current government receipts in 1974.) The ratio of tax revenue per se to GDP actually declined slightly to 16%, after having increased from 15.6% in 1972 to 16.8% in 1973.

b. Capital Account

Capital expenditures grew by TD 10 million (12%) in 1973 and TD 55 million (almost 60%) in 1974, increasing their share in total expenditures from 28-29% to 33%. Direct ^{budgeted} investment expenditures did not increase at all in 1973, but then jumped 60% in 1974. Subsidies and loans to public enterprises increased 73% in 1973 and 78% in 1974, bringing their share in total capital expenditures up from one quarter to nearly half.

Current account savings increased their share in capital account resources from about 52% in 1972 and 1973 to 64% in 1974. There was an offsetting decline in the share of external resources (net borrowing plus grants) from about 35% in 1972 and 1973 to 21% in 1974, so that the share of other domestic resources remained at about 14% throughout the period.

Because the increase in revenues outpaced expenditures, particularly lagging public investments, a budgetary surplus resulted in large Central Bank deposits of TD 70 million at the end of November, 1974.

c. Projections 1975-1976

Current expenditures are projected to increase 18.5% in 1975 and only 8.8% in 1976. This is much faster than growth of money GDP in 1975 (10.3%), but only slightly more than the projected 8.3% growth of GDP in 1976. Over half of the 1975 current expenditure increase and slightly less than half that in 1976 is due to higher personnel costs. Nearly all of the remainder of the 1975 increase is caused by subsidy payments, especially those carried out through the Caisse de Compensation. The

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budgetary contribution to this fund, which is intended to "stabilize" the prices of basic food commodities and some agricultural inputs, is expected to reach TD 25 million in 1975 as compared to TD 6 million in 1974 and only TD 500,000 in 1973. (The amount of the subsidy provided is actually much higher--TD 53 million in 1974-- , since the fund has other sources of revenue). Increased subsidies are expected to play less of a role in expenditure growth in 1976.

Current receipts are projected to grow by 11.7% in 1975 and 12.2% in 1976. This is much less than the rate of increase for current expenditures in 1975 but substantially exceeds that for 1976. As a result, current account savings are projected to drop by nearly TD 10 million (9.3%) in 1975 and then grow again by TD 22.4 million (25.8%) in 1976.

It should be noted, however, that although these projections take into consideration new receipts from phosphates amounting to TD 26 million in 1975 and TD 37 million in 1976, they also incorporate a projected decline in 1975 of nearly TD 9 million in profits from petroleum exploitation and a return in 1976 to somewhat less than the 1974 level. These projections appear to ignore the probable expansion of petroleum production. (see Section A.1.e above).

Capital expenditures are projected to increase by only TD 18 million (12%) in 1975 and TD 12 million (8%) in 1976. However, direct investment is expected to grow at a much faster rate (21% in 1975 and 20% in 1976) as subsidies and loans to public enterprises, which grew so rapidly in the past two years, level off in 1975 and decline in 1976.

The share of current account savings in capital account resources is projected to return in 1975 to the 52% level of 1972-73 and increase somewhat to 56% in 1976. The share of external resources is to decline further to below 20% in 1975 and 1976.

3. External Assistance

During the ten year period 1961-1970, Tunisia received, according to Ministry of Plan computations, TD 415 million in foreign public assistance. This annual average of somewhat over TD 40 million per year, was the result of an irregular but generally rising pattern of receipts during the period. Foreign assistance receipts jumped to TD 62 million in 1971, remained at the same level in 1972, and have risen by about TD 3 million in each of the past two years. This rate of growth is projected to continue in 1975, but the GOT projects a large jump (not easily explained) in 1976.

a. Grants

The share of grants in total assistance (excluding the grant element in concessional loans) fell to 20% in 1967. It then grew, as grants increased and loan disbursements declined, until it reached nearly 42% in 1970. Grants fell to about TD 17 million in 1971 and remained at that level for the next 2 years, while loan disbursements grew. Consequently,

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by 1973, the share of grants in total assistance had fallen to about one-fourth. Small increases in grants are indicated in estimates for 1974 and projections for 1975-76.

According to Ministry of Plan data, in recent years (1972-74) about TD 12 million of the TD 17-19 million received as grants took the form of technical assistance. This figure is well below the incomplete total of \$42.3 million (TD 18.4 million) for 1973 expenditures arrived at by the UN Resident Representative on the basis of information received from donors. A substantial part of the difference may be accounted for by the inclusion by the UN, but apparently not (at least in some cases) by the Ministry of Plan, of assistance provided through private organizations. This includes, for example, the Title II feeding programs of CARE and Catholic Relief Services amounting to over \$2 million, technical assistance provided by the Ford Foundation for development of cereals production, education and management training, as well as that provided by Project Hope for training of doctors, nurses and other medical personnel. Probably not in either compilation is the roughly \$3 million a year in U.S.-owned surplus dinars the U.S. has been expending for research projects many of which make a direct contribution to improvement of medical treatment, education, agricultural development, and other sectors of the economy.

Insufficient information is available to make a meaningful comparison among donor countries on the basis of the value of technical assistance provided. On the basis of the number of personnel provided in 1973, however, the principal donors, roughly in order of importance, were France (including 2,000 teaching "cooperants"), Bulgaria, the U.S. (including the Peace Corps), Belgium, the UNDP, the USSR, the Federal Republic of Germany, Canada, Czechoslovakia, Sweden, Poland, and the Netherlands.

With inclusion of "cooperants", education is clearly the sector receiving the greatest emphasis - 2,337 out of a total of 3,414 foreign technicians. "Cooperants" in the field of health and population (some 375 physicians, mainly from Bulgaria, France, the USSR, and Czechoslovakia, plus about 20 from the People's Republic of China who have arrived this year) bring that sector to second place behind education in terms of emphasis. If one were to exclude the category of "cooperant", however, agriculture would easily occupy first place, with more than a quarter of the total.

Besides technical assistance, a sizeable portion of grant assistance to Tunisia has taken the form of food aid received from the U.S., France, Italy, Canada, the EEC and the World Food Program. Food assistance amounted to nearly TD 10 million in 1970 but dropped to about half that amount in each of the years 1971-72, and a little over TD 3 million a year in 1973-74, due chiefly to declines in assistance from the U.S. (PL 480 Title I) and that from the WFP. The GOT projects food assistance to continue at about TD 3 million in each of the next two years.

During the years 1970-1973, cash grants were relatively insignificant in amount and came mainly from Sweden. In 1974, however,

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agreements were signed with Saudi Arabia and with the United Arab Emirates for grants amounting to TD 8.2 million and TD 6.6 million respectively. An estimated TD 2.2 million of the U.A.E. grant was disbursed in 1974, with the remainder to be disbursed evenly over the next two years. The funds are to be used for construction, including a new faculty of medicine in the Sahel region, a number of secondary schools, and housing. Only a small part of the Saudi grant was disbursed in 1974, but all of the remainder is expected to be used over the next two years. The funds are intended mainly for construction of secondary schools and regional hospitals.

b. Loans

Disbursements on loans from official sources followed an irregular pattern in the last half of the 1960's, ranging from TD 26-42 million and averaging about TD 33 million annually. Beginning in 1971, the pattern has been much smoother, following a generally upward trend. Disbursements amounted to TD 45 million annually in 1971 and 1972, TD 49 million in 1973 and 1974, and are projected at TD 51.5 million in 1975.

The U.S. was in first place among public lenders through 1972, with its share moving downward from nearly half of bilateral and two-fifths of all official assistance in 1970 to one-third of bilateral and one-fourth of all official assistance in 1972. However, with the phase-down of Title I programs and the signature of only one development assistance loan since 1970, the U.S. dropped to sixth place in 1973 and fourth in 1974.

The most rapid growth in loan assistance has been in that from the IBRD/IDA, which moved from third place in 1970 to second in 1971 and 1972 and first in the past two years. Disbursements on IBRD/IDA loans grew from one-sixth of total official loans in 1970 to over one-fourth in 1974, when they are estimated to have amounted to TD 14 million.

Among other lenders, France, with a fluctuating level of loan disbursements, has occupied second, third, or fourth place in the past 5 years. The role of the Federal Republic of Germany has been growing steadily bringing it up from fourth place in 1970 to second in 1974, as has (at a significantly lower level) that of Canada and Sweden. Italy has been the source each year of from TD 1-6 million of loan funds, and there was a one-time disbursement of TD 4.2 from Abu Dhabi in 1974. A number of loan agreements have been signed with other oil-producing countries and with the Arab Development Fund during 1974, so that these new sources of lending are likely to assume a position of considerable importance in the next few years. Expenditures against a loan equivalent to TD 18 million from the People's Republic of China will probably begin on a sizeable scale in 1975.

During the years 1970-1972 about 40% of loan disbursements related to non-project loans. In 1973 and 1974, however, the proportion dropped to one-fourth (TD 12.5 million out of a total of TD 50 million) largely because of the decline in disbursements on U.S. loans, including those under PL 480, Title I.

Only a very rough categorization of lending by sector is possible, but it is clear that infrastructure has received the greatest

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emphasis. Of those project loans active during 1974 (totaling about TD 225 million) which could be categorized, about 30% were for transportation. The addition of other infrastructure (water, electricity, and communications) brings the total up over half, even without including the category of tourism, some of which is for infrastructure investment. Agriculture and industry each received about 20% of loans, much of it in both cases through intermediate credit institutions. Health and education each received only relatively small shares.

The picture would probably be somewhat different, particularly with regard to agriculture, if one were able to allocate sectorally non-project assistance. Much of the local currency generations from PL 480 Title I Loans, for example, were devoted to agriculture. Moreover, the picture seems to be changing, if one examines the pattern of recent and planned lending. The IBRD, especially, is moving away from the infrastructure area (to which it devoted over 40% of its loans in the 1969-73 period) toward agriculture and rural development. This shift is doubly important given the growing role the IBRD is playing in the lending picture. Likewise, the increasing relative contribution of Germany, which has devoted over two-thirds of its lending to agriculture, will also serve to increase the share of the agricultural sector in total receipts from official loans.

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III. SUMMARY OF SECTORAL DISCUSSIONS

U.S. bilateral assistance projects are now being carried out in the areas of food production, nutrition, family planning and higher education. In order to place these activities in the context of overall Tunisian development prospects and sectoral strategies, and to determine whether some revision in our current program is required, the USAID chose to incorporate sector statements in agriculture, health and education into the DAP. These are attached as Annexes A, B and C.

In this section of the paper the USAID presents a brief discussion of each of these sectors, drawing upon the annexes, and highlighting historical trends, government policies, sectoral strengths and weaknesses, and current other donor and A.I.D. programs addressing these constraints. The assessment presented here, in summary form, sets the stage for the revised U.S. bilateral assistance strategy proposed in Part IV.

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A. Agriculture Sector Discussion

1. Historical Trends

During the entire decade of the 1960's Tunisian agriculture was stagnant or retrogressed. The experiment in collective or cooperative farming proved to be disastrous for production, as well as unpopular with the farmers, and the policy was abandoned in 1969. Early in the decade production slumped because of the departure of many of the European farm managerial personnel. At about the same time the Government instituted a stern policy designed eventually to place all agricultural lands into Government supervised production cooperatives.

The agriculture sector thus far in the 1970's has made good progress. During the four-year period 1971-74, production increased at an average annual rate of about 15%. Production of cereals, olives, and vegetables reached record levels, although fluctuating from year to year because of climatic influences. These new levels of production were achieved not only because of increasing use of improved production technology (fertilizer, improved seed, herbicides and pesticides, and better tillage machinery) but also because the weather has been unusually favorable in terms of the amount and distribution of rainfall. An extended drought with disastrous consequences could occur in any crop year. As a matter of record, during the past several decades the frequency of good crop years is about 2 years in 5; fair crops 2 years in 5; and crop disasters one year in 5. Fortunately the use of improved technology can help to modify the effects of unfavorable weather by making more efficient use of moisture which is available.

2. Past, Present and Likely Future Government Policies, Priorities and Programs

The experience of the 1960's with a stagnant to negative agricultural growth caused the GOT to reexamine its goals, priorities and potentials.

In 1969 the GOT reversed the very unpopular policy of systematically organizing all farms into production cooperatives, and established a policy of coexistence of state, cooperative, and private farm ownership. Since that time there has been increased emphasis on developing and setting in motion programs to help the private farmers.

An attempt has been to analyze resources and resource potentials and identify production alternatives.

The fundamental objective assigned to the agriculture sector in the Four-Year Plan is acceleration of the growth of production. Greater

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production is considered essential in order to:

- 1) satisfy domestic demand which is increasing through population growth and improvement of incomes;
- 2) assure raw materials for the food processing industry; and
- 3) provide foreign exchange through exports.

The production objective is to be attained while at the same time making it possible for the majority of the rural population to participate in development, an objective that is considered as important as production increase.

Concerning employment creation, which is assigned the highest overall priority in the Plan, agriculture's contribution is expected to be a reduction in underemployment through an increase of 10-12 percent in the number of days of work while the number of people employed in the sector remains the same. In order to accomplish this, a high priority is to be given to livestock and forage production and to putting into production areas already equipped for irrigation. These and other relatively labor-intensive sub-sectors will thus more than compensate for the reduction in labor inputs expected from further mechanization of cereals production.

With regard to investment, 60 percent is to be directed toward productive uses (as compared to only 24 percent during the previous Plan period.) The total amount of investment for the sector is to be 70 percent greater than under the Third Plan. The public sector is to account for 56 percent of the total as compared to 84 percent previously.

The Plan forecasts an annual growth rate of 6.2% for agriculture compared to 7.6% for the economy as a whole. Cereal production was expected to grow at an annual rate of 6.1% as a result of new varieties of high yield potential and wider use of fertilizers and herbicides. The annual production increase of meat, milk and eggs was targeted at 7.8, 11.5, and 9.5 percent respectively.

Irrigation facilities were to be expanded and perimeters which were equipped, but not under irrigation, would be completed.

The Government's price and subsidy policies are intended to benefit both the farmer and consumer. Prices of all agricultural products except fruit and vegetables are fixed by the Government in an effort to keep food prices at reasonable levels. On the other hand production inputs (fertilizer, herbicides and certified seed) and farm machinery are heavily subsidized to keep production costs down and enable the farmer to make a profit at the fixed price for his production. For example, nitrogen fertilizer is sold to Tunisian farmers at about one-third current actual cost.

Whether Tunisia can continue to subsidize production and consumption at present levels in the face of mounting costs of fuel, machinery, fertilizer, and herbicides seems questionable.

3. Economic Factors

a. Food Consumption and Employment

Consumption of staple foods (cereals) in recent years has increased only slightly, corresponding to the estimated rate of population growth of 2.8-3.0 percent per year. However, reflecting higher income levels, there has been a greater rate of increase in the consumption of livestock and poultry meats, eggs and milk supplied by increases in domestic production and greater imports of these commodities. Increases in consumption of meat, poultry, milk and milk products are believed to be concentrated in the salaried worker groups.

Cereals consumption for food in 1974 was estimated at 1,221,600 MT., while animals consumed 197,000 MT. Imports total 364,000 MT. The annual increase in the cereals requirement for all purposes is on the order of 200,000 MT.

Agriculture provides employment for about half of the labor force. This figure is expected to decline during the next few years. Much of the employment is seasonal corresponding to the harvest period for grapes, olives, cereals, fruits and vegetables. Large numbers of women are employed in harvesting these crops.

b. Land Tenure

The present land tenure situation and problems are products of the French protectorate and the colon system together with continuation of traditional communal systems of land holdings. As a result of the nationalization of all foreign owned land, much of the best agricultural land is now under state ownership. During the protectorate these lands produced most of the commodities entering commercial channels. Some of the nationalized land has been transferred to private ownership but in 1974 some 816,000 hectares were still held by the state in cooperative farms, agro-combinates, pilot and educational farms, and land to be sold to young farmers. A total of some 300,000 hectares of these lands are earmarked for distribution and sale to private farmers during the current Four-Year Plan (1973-76).

Since 1971 some 111,400 hectares have been distributed to 21,292 individuals.

Regularizing the land tenure system and the establishment of private ownership with a recorded title remains a large task for the Government, and a constraint to agricultural development.

Parcellation of land by successive division among family members has resulted in a very large number of small unviable farms. Some 131,600 farms, or 41% of all privately owned farms, range in size from 1-5 hectares. The Government plans eventually to regroup small unviable parcels into larger units.

c. Irrigation Development

Tunisia's limited supply of water, the need for irrigation to maximize use of the limited cultivable land, and the expanding need for domestic water, requires carefully balanced and coordinated planning. The main objectives in irrigation are to allow a wider choice of crops during the long dry summer months, and to replenish the water resources of Cap Bon and the Sahel for expanded production of citrus and vegetables. These objectives are to be achieved by expansion of the number of wells for small irrigation systems, the construction of additional dams and more effective operation of irrigation perimeters.

d. Distribution and Marketing Systems

The prices of all agricultural products except fruit and vegetables are controlled. Marketing and distribution of all controlled products move through the semi-government offices, cooperatives and grower's associations. Agricultural supplies move through the same channels. There is, however, a parallel channel of distribution of supplies through private trade channels. These handle a smaller percentage of products than the government agencies, mainly because they do not supply credit-in-kind.

Prices of cereals are controlled. The present prices are TD 61 per MT for durum wheat, TD 55 per MT for bread wheat and TD 40 per MT for barley. These figures are about 50% below the corresponding prices in Europe. Production inputs receive heavy subsidies, amounting, in the case of nitrogen fertilizer, to about two-thirds actual cost. On the other end of the market, a current consumer subsidy of some TD 15 per MT for durum wheat, TD 14 per MT for bread wheat and TD 23 per MT for barley is paid to millers.

e. Processing Industries

Agricultural and food processing industries are by far the most important component of the manufacturing sector. They contribute 33-40% of the value added by the manufacturing sector and account for 3.5-4.0% of the domestic product.

Milling and baking traditionally have been the largest component of the food processing industry accounting for one-fourth to one-third of the value produced. Other segments in the order of their importance are: meat slaughtering and packing; olive processing; sugar refining; and the fruit and vegetable canning industry.

The food industry is not a major source of employment. In 1971 it employed about 9,000 workers on a full-time basis and an additional 9,000 on a seasonal basis.

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The food processing industries are concentrated largely in the Tunis area accounting for some 65% of the permanent employment in that sector. Only bakeries and bottling works are located throughout the country.

The Government decided in 1972 to decentralize the milling industry now concentrated in the Tunis area and has approved the installation of five new mills in other regions.

4. Institutional Strengths and Weaknesses

a. Organizations and Cooperatives

The Government has sought to improve its services by increasing the staff of trained technicians, by developing semi-governmental agencies, offices, and so-called "professional groups", and by programs of decentralization of planning and administration. It is seeking to reach greater numbers of the rural population through decentralized, integrated, rural development projects. Regional offices of "Agricultural Commissariats" in the office of each Governorate are the principal administrative units in the field. Their roles and staffs are being increased.

A number of commodity-oriented organizations have been established by the Government and given specific agricultural development roles. They include the Offices of Cereals, Oils, Livestock, and Wine. They provide agricultural extension services and credit, procure supplies and assist in marketing the final product for farmers. Several Irrigation Offices have a similar function in the area served by irrigation systems.

Professional groups have been created to provide technical assistance to farmers, to assist in obtaining needed supplies and marketing the final product. These groups serve the citrus, vegetable and date growers.

Seven Central Service Cooperatives, including two responsible for certified seed processing, storage and distribution, and a few hundred local service cooperatives provide direct supply and marketing facilities to farmers.

b. Research

Three institutes, each with several outlying stations, are responsible for Agricultural Research. These are: The National Institute for Agricultural Research (INRAT), The Centre for Agricultural Engineering Research, and The National Forestry Institute (INRF). A fourth institute, The National Institute of Science and Technology for Oceanography and Fisheries (INSTOP) is responsible for fisheries research.

Laboratory facilities for work in support of agronomic

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research are available and reasonably adequate. The soils, cereal technology and entomology facilities are good but a full staff, especially at the Ph.D. level, is not yet on board. The genetics and plant pathology units each have one or more U.S. trained technicians who are capable of doing excellent work and have started on good research projects.

The staff of INRAT is too small to carry out all the research needed to determine the production requirements of the more important crops. There are, however, a limited number of technicians both locally and foreign trained who are capable of designing projects, conducting research, interpreting the data and formulating recommendations suitable for improving agricultural production. The number of Tunisian scientists who have been trained to the Ph.D. level is limited to three or four, and according to the Director of INRAT, only two Tunisians trained to the Ph.D. level have entered the research service in the last two years. Both were trained under the AID- assisted Cereals Project.

Some of the foreign experts working at the station feel that with the exception of genetics and plant pathology which have three highly trained personnel, research will deteriorate on most projects when the foreign experts leave unless more Tunisians are trained to a higher level.

The Four-Year Plan projects the need for 30 professional staff members and 60 technicians. The professional staff would be composed of researchers (M.S. or Ph.D.'s) and "Ingenieurs" (B.S.). The technicians would be at the level of "Ingenieurs Adjoints". These technicians are graduates of agricultural high schools and have completed two years of special training at an agricultural institute.

Among the personnel problems reported in the Four-Year Plan is the lower status in the civil service of employees of the research institutes than personnel of similar training in other services. Corrective measures need to be (and reportedly are about to be) taken to attract highly qualified personnel into research careers.

c. Education

The policy of the Government toward Agricultural education is to increase the number of graduates, integrate programs where possible and increase the number of specialists trained. The intent is to train people who have "saleable" skills needed in Tunisia or abroad.

The National Agricultural School (INAT) has added an additional two years to permit specialization at the "Ingenieur Agronome" level (MS. equivalent). The goal is to double the present capacity of 50-60 graduates (of the 4-year curriculum, B.S. level) to around 120 per year.

In addition to INAT, the college level institute, Tunisia has three specialized institutes offering training in agricultural engineering,

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irrigation agronomy and forestry and range management at Medjez el Bab, Chott Maria, and Tabarka respectively.

Eight agricultural high schools, one of which is for girls, have an enrollment capacity for 1,680 students. The curriculum requires 4 years of course work followed by one year of practical training.

Seventeen 2-year vocational agricultural training centers (14 for boys and 3 for girls) can train 2,830 students per year.

These programs indicate that within a few years, the country will meet its needs in middle and lower level personnel, but there will remain a shortage of personnel trained to the equivalent of the M.S. and Ph.D. degrees.

d. Extension

A Central Extension Division, headed by a Director, is located in Tunis and maintains a number of extension agents in the various Governorates. In addition there are four semi-autonomous commodity offices, described above, working in specialized areas of agricultural production, which have their own extension programs and staffs. In addition, the irrigation perimeter offices also have extension staffs. The responsibilities of these offices have been assigned to them by the Minister of Agriculture along with some latitude in employment and operational policies.

The net results of this scattering of responsibilities for extension are (1) lack of coordination of a national program of extension, (2) fragmentation of extension activities, and (3) overlapping and duplication of activities in numerous locations.

However, some of the commodity extension programs as such are well planned and executed. The Office of Cereals, through the Technical Division Unit, conducts, each year, an effective extension program. This program includes well designed demonstration programs on wheat varieties, fertilizer application, weed control and crop rotation. The demonstrations are publicized and, at appropriate times, are explained to large audiences of farmers. Livestock and other offices have similar programs and all are directed toward the goal of increasing agricultural production and improving farmers' incomes. Both of these activities have been developed with considerable technical assistance by USAID and other donors.

The problems which still need to be solved include:

- (1) Insufficient staff at the B.S. level;
- (2) Insufficient numbers and inadequate training at the "adjoint technique" level;
- (3) Lack of an extension subject matter specialist cadre at the national level;
- (4) Lack of logistics support for all the staff, i.e. vehicles, gasoline, demonstration equipment and supplies;

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- (5) Insufficient travel allowances to cover actual expenses of staff when on official duty away from post;
- (6) Poor coordination between national, local, and office staff;
- (7) Limited opportunity for advancement of personnel and little or no recognition for notable accomplishments; and
- (8) Production inputs not always available to the farmer.

e. Planning

There has been some progress made in agricultural planning. The staff of the planning bureau (DPEA) in the Ministry of Agriculture now has 10 agricultural economists trained to the M.S. level through the University of Minnesota contract. While the organization of the bureau has gone through several reorganizations, an adequate framework exists for effective work of the returned participants. They are actively participating in economic analysis and planning, working in harmony with their American counterparts provided by the University of Minnesota.

A number of economic analysis papers have been produced and analytical and planning data prepared which are useful to planning. The "Budget Economique" for 1975 had a major input by the DPEA including demand projections by region for fertilizer and seed for next year by crop and by month. This data if used by the procurement organizations should improve the availability of fertilizer to farmers.

5. Other Donor Programs

In 1974, Tunisia was receiving assistance in the field of agriculture from more than a dozen countries plus the UN family of organizations and private groups. Nearly 50 separate projects were involved. However, the term "project" is used here in a broad sense to include discrete activities ranging from a single short-term scholarship to multi-annual programs involving a combination of numerous technicians, scholarships, and commodities. Nearly one-fourth of all technical assistance projects in Tunisia were in the field of agriculture, making this the most favored sector. The approximately 250 experts working in this field represented a much smaller proportion of the total in all fields, however, because of the large number of French teachers and doctors working as "coopérants" in lieu of military service.

Because of the highly specialized nature of some projects and the multi-purpose nature of others, categorization is difficult. In general, however, one can say that livestock production was the area receiving assistance from by far the largest number of sources. Germany, Austria,

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Holland, Canada, Belgium, Sweden (through the FAO) and the U.S., all had at least one project in this area and some countries had more than one. The nature of the assistance included provision of breeding animals (Germany, Austria), some 20 experts (mainly from Germany, Belgium and the U.S.), study abroad (U.S.) and small amounts of equipment. Research was being addressed in one fashion or another by at least five different projects: the UNDP/FAO in forestry; UNDP/FAO/UNESCO in arid zone agricultural development; Germany and France in a variety of fields at both INRAT and at experiment stations; and Belgium in horticulture. Work in extension (in addition to that carried out in connection with other specialized projects) was being done by Germany, Belgium, Canada, and the Peace Corps. "Integrated" agricultural development projects of one kind or another are being undertaken by Holland, Sweden, and Canada, in addition to the U.S.

Assistance in other fields included: irrigation (FAO/Sweden, Canada); education (France); seed production (Germany); plant disease (Germany); horticulture (Belgium, Bulgaria); machinery maintenance (Canada); poultry (Ecumenical Council of Churches, Canada); cereals (AID, Ford Foundation/CIMMYT); credit (Italy); olives (Sweden/FAO); farm management (Ecumenical Council of Churches); agricultural economics and planning (AID).

Although cost data is not available for most countries, it is apparent that the most important donors are Germany, Canada, Belgium, and the U.S., not necessarily in that order.

6. Role of Women

Women participate at all levels in Tunisian agriculture. Their importance and valuable contribution is officially recognized by the Government. Women compete on an equal basis with men for places in the National College of Agriculture and for foreign scholarships to study agriculture. Two women participants in the USAID project earned M.S. degrees in agricultural economics in the U.S. and are now employed in the Ministry of Agriculture. An additional woman is in the U.S. working toward a M.S. degree.

One of the 8 agricultural high schools, each of which has a capacity for about 200 students, is for girls. At a somewhat lower level, two of 17 vocational agriculture training centers are for girls.

Women make up at least half of the seasonal labor force required for harvesting olives, citrus, vegetables, grapes and the hand weeding of crops. Most of the permanent laborers in agriculture, however, are men.

Women may operate farms, secure agricultural credit and purchase farm inputs on an equal basis with men, but the number participating in these activities is still relatively small.

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7. Summary of Sectoral Constraints

1. Much of the land area of the country is unusable for agricultural purposes, and even in the cultivable zone only about 2 years out of 5 can be expected to have adequate rainfall for good production. At the same time, the supply of water and competition for its use severely limits the potential for irrigation.

2. Extension and research activities are directly benefiting only a small percentage of the farm population, and the nature of these activities is not well-suited to the needs of small farmers.

3. Timely mobilization of agricultural inputs - seed, fertilizer, machinery, etc. - is often inadequate. In addition to its negative impact on production, this tends to diminish the effectiveness of extension activities.

4. Pricing and subsidy policies appear to be oriented more toward benefiting consumers than providing incentives to farmers.

5. Lack of availability of credit for small farmers and deficiencies in the marketing system, while perhaps not presently major constraints on production, will become increasingly important as other constraints are relaxed.

6. Many farmers' uncertainty of tenure due to the lack of proof of land ownership discourages investment in permanent improvements, such as irrigation facilities. Elimination of this uncertainty also probably will be a necessary step in reducing the problem of credit availability.

7. There is an insufficient number of people with appropriate training at every level in the system, from research to producer.

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B. HEALTH SECTOR DISCUSSION

The health of the Tunisian population, although well behind levels achieved in the developed countries, has improved markedly since World War II. Estimated figures suggest that mortality has fallen from 27 to 16 per thousand, infant mortality from 220 to 100, and life expectancy at birth has increased from 30 to 51 years. Much of this has been accomplished through control of the major communicable diseases such as smallpox, typhus, typhoid, malaria, poliomyelitis, and diphtheria. Despite this progress, environmental health problems remain as the major cause of mortality and morbidity. Nearly one-half the reported deaths are of children under five; some 30% of the population suffer significant nutritional deficiencies; and tuberculosis, respiratory infections, gastro-intestinal and parasitic infections, eye, skin and venereal diseases are the most significant problems.

To face these needs, the Ministry of Health has an extensive network of general, regional and rural hospitals and some specialized institutes which together provided 12,571 beds in 1971, or about 2.4 beds per thousand population (U.S. - 5.3, Sweden - 10.3). There are about 90 maternal and child health (MCH) centers and nearly 400 local dispensaries. Three general hospitals are being expanded; four new regional hospitals, 29 MCH centers, and 100 dispensaries are now being constructed under the 1973-76 Plan. In addition to programs to reach the broad mass of the Tunisian population, the Government is also concerned about the inadequacy of modern medical facilities including additional facilities for medical training and research. Consequently the GOT hopes to establish a high level American-type hospital in Monastir, to include training and modern research facilities, and is currently discussing such a proposal with Project Hope.

In 1973, there were 846 physicians in Tunisia, of whom 405 were Tunisians and 441 foreigners. Most of the latter served full-time in the public service; most of the former were in private practice, although many also worked part time in the public service. Overall, there was a ratio of 1 doctor to 6,335 inhabitants (U.S. - 1/650), but the distribution varied from 1/2,529 in Tunis to 1/23,090 in Kasserine. A medical school was founded in Tunis in 1964, and new ones were opened in Sfax and Sousse in 1974. Through these schools, the GOT expects to graduate about 150 new physicians a year in order to reach a physician/population ratio of 1/4,000 in 1981 and 1/2,000 in 1990.

In 1972, there were 1,303 nurses, 150 mid-wives, 509 public health hygienists, and 3,472 nurses aides in the public service. The number of these personnel assigned to hospital care represented about .24 per bed. Current planning calls for an increase to between .45 and .57 per bed. There are 9 schools training various categories of non-physician health personnel. Some 400 nurses and nurses aides are graduated annually and should meet job demands in a few years. Nurses aide training is gradually

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being replaced by nurses training. Conversely, only 53 mid-wives were graduated in 1974, far from meeting a demand estimated at 600. In general, non-physician personnel have little professional status, are trained to assume very limited responsibilities, and are poorly supervised.

In addition to its hospital and other curative programs, the GOT provides preventive care through several means:

a. A Preventive and Social Medicine Division in the Ministry of Health with about 1,000 employees who direct vaccinations, and conduct campaigns against malaria, trachoma and other diseases, and encourage environmental health activities.

b. A Nutrition Institute, developed to provide research and education in nutrition; the application of improved processing, fortification and standards in the food industry; and the planning and coordination of a national nutritional strategy. With substantial A.I.D. and other assistance, this Institute is now operational and beginning to undertake the broad tasks planned for it.

c. A National Office of Family Planning and Population which coordinates and supports a nationwide family planning program carried out in the various facilities of the Ministry of Health. Since 1972, the program has improved its management and results, and its 1974-1977 program recently issued provides a more professional basis for attacking the many problems that remain. The 1974 goals are 17,000 new IUD insertions, 11,000 new pill acceptors, 8,500 tubal ligations, and 10,000 social abortions. These objectives will be met for the most part, and will represent nearly twice as many births averted as was achieved in 1972. This program has received substantial A.I.D. and IBRD/IDA assistance, as well as lesser support from a variety of other donors.

d. The 90 MCH centers, nominally under the guidance of the National Institute of Child Health (Children's Hospital) provide some preventive care, although most attention is devoted to curative work.

The 1973-1976 National Plan calls for a capital investment of 26 million dinars in health facilities, compared to some 10 million dinars spent in the entire period from 1962 to 1971. Operational funds will rise from 16.2 million dinars in 1972 to 24 million in 1976. They now represent about 8.8 percent of the total national budget. The Plan calls for an improved program of preventive health including disease control, sanitation, and expanded education. Excluding family planning, however, preventive health currently receives only about 8 percent of the Health budget, plus some activities carried out as part of curative functions. Outside the Ministry of Health, the funds made available for rural water supplies and sanitation have been a small fraction of those devoted to urban needs.

Analysis of the Tunisian health status and plans thus shows that considerable progress has been achieved, and a substantial and expanding effort is being made to improve health. It is likely, however, that health programs will have less effect in lowering mortality and morbidity than could otherwise be achieved due to (a) an underemphasis on environmental

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health and sanitation, and (b) an overemphasis on hospitals and physician-delivered curative care. With regard to the first of these concerns, some important aspects, such as family planning and nutrition, are being dealt with in an increasingly effective way. Others, such as better use of MCH centers, improvement of rural water supplies and sanitation, and adequate numbers and education of preventive health personnel, have not been recognized.

The hospital-physician emphasis in the Plan will have the unintended effect of maintaining the existing inequality between rural and urban health services. Better paid and supervised nurses and mid-wives, trained and authorized to provide a range of care and screening, would represent a much surer way of reaching the rural population.

Both of the above problem areas, as well as the frequently poor organization, planning and quality of public health, are a reflection of the lack of personnel with professional public health training in the Ministry of Health. Policy has come from the interaction of political forces and clinically trained and oriented physicians.

The bulk of foreign assistance received by Tunisia in the health field has been in the form of doctors for operational positions, or for constructing and equipping facilities. These doctors remain essential, and facilities have generally been justified. On the other hand, WHO, UNICEF and SIDA have regularly encouraged greater attention to preventive health. Many other donors, such as Project Hope, would have provided such an emphasis in their programs had it been understood and desired by the GOT. Some progress has been made, and further opportunities should be sought. A.I.D. assistance in nutrition and family planning is clearly directed at the most important health need, and should be continued. Both provide important possibilities for expanding training and understanding of public health and preventive care.

Similarly, A.I.D. should explore means of expending the limited assistance it has previously undertaken with CARE/MEDICO to improve rural health and sanitation through protected wells and other water supplies. Some Tunisian officials have indicated an interest in expanding the role of non-physician personnel in health services. A pilot program to demonstrate the possibilities of such an approach would be of high priority if encouraged by senior Ministry officials. Lastly, limited assistance could be considered, in conjunction with WHO, in helping establish a school of public health in one of the new medical facilities.

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C. Education and Manpower Sector Discussion

From the time of independence in 1956, the Tunisian Government has both viewed and supported education as its major instrument for achieving the twin goals of social reform and economic development. As a consequence, nearly a third of the national budget has gone annually to implement a policy of universal primary education and the massive expansion of secondary and higher education. The results have been impressive with an increase in enrollment, between 1958 and 1971, from 320,000 to 934,000 in primary school, from 33,000 to 184,000 in secondary schools and from about 2,000 to 11,000 at the post secondary level. By 1971, 73 percent of the 6-14 age group were attending school, as were 42 percent of the 15-19 age group and 3 percent of the 20-24 group. Very few developing countries have achieved such a record.

In 1973, an IBRD Appraisal Team made a comprehensive review of Tunisian education. The report of this team is attached as Annex C and constitutes the basic sector assessment for this DAP. The principal findings of that report, as supplemented by USAID experience in certain areas, are set out below.

1. Primary Education

The initial goal of universal primary education by 1972 overestimated the employability of young school leavers and underestimated the increase in school age population. Nevertheless, it remains a stated policy of the Fourth Plan (1973-76) that primary education be made available for all school age children who wish to enroll. In practice, despite great overall progress towards this goal, there remain significant urban/rural and male/female disparities in its achievement.

The primary school curriculum is heavily burdened with its language component. Besides classical Arabic, which is more complex than the Arabic spoken in the home, French is used as the language of instruction beginning in the second grade. In general, the curriculum is geared more to the preparation of children to pass the entrance examination into the secondary schools than to the skills and knowledge needed for active participation in the economic and social life of the rural areas.

Further, due to a heavy repeater rate, a large percentage of students take more than six years to complete primary school. Another indicator of wastage is that 30% do not complete the primary grades and 23% of those who do, fail to qualify on exams for the secondary level.

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2. Secondary Education

Science, technology, and vocational education at the secondary and higher levels have not received adequate attention. The Fourth Plan assigns priority to correcting this imbalance. Also of particular concern in secondary education are the rising costs, growing demand, and the increase in unemployed school leavers, particularly among those with general rather than technical education. Two important causes of high costs are the school-
arships provided for all students, and payments for foreign teachers who make up nearly a third of the teaching staff. There is a high wastage rate at the secondary level with 75% of the students who enter in the freshman year dropping out before completion. Finally, now that the jobs vacated by the foreigners after Independence have been filled, graduates are finding it increasingly difficult to find jobs (75% of the new jobs created are for experienced workers, not apprentices).

In order to cope with this serious situation, the GOT in 1971 reduced admissions to secondary schools from 40% of primary school leavers to 25%. This, however, caused further social inequity since admission is based on an even higher standard of French than before and places students from poorer homes and rural areas at a great disadvantage.

3. Higher Education

The nine faculties, institutes or schools of higher education enroll about 11,000 students. As at the secondary level, there is a serious imbalance between the large enrollment in literature and arts, and the employment market demand for scientific and technical graduates. With unemployment of graduates beginning to occur in 1971, the minister of Education has taken increasing steps to shift enrollment toward the technical fields. Again, as in secondary education, there is a heavy dependence on foreign teachers in these fields.

4. Agricultural Education

Agricultural training is the responsibility of the Ministry of Agriculture. The programs now provided range from the training of specialized workers to preparation for university degrees. In 1972 there were 460 graduates from junior and senior secondary agricultural schools whose programs are designed to prepare extension agents. That same year 5,700 persons completed two year practical farm training programs at 31 agricultural vocational training centers.

5. Non-formal Education

Non-formal education in Tunisia is generally conceived of as complementary to the regular school program; that is, specialized training of short duration with specific and limited objectives, and which builds

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upon a base of general knowledge acquired through the formal education process. Vocational training centers were organized after Independence to fill the jobs of departing non-Tunisian workers. In 1966 the Office of Vocational Training and Employment (OFPE) * was created in the Ministry of Social Affairs to coordinate and manage training. There are currently 27 centers for adult training. Each year 7,200 persons are trained for six months to two years in various specialized fields. OFPE also supervises other vocational training, which includes a new pilot program in the primary schools, in-plant apprentice training, and other courses given by correspondence or in the evenings. The total number of students receiving some vocational education outside the Ministry of Education, either through the OFPE or one of fifteen other organizations or ministries, is estimated at 27,400 per year.

A national program to reduce illiteracy was undertaken in 1965. An evaluation in 1972 of the better program centers showed that four years' attendance was necessary to achieve the proficiency of a sixth-grade primary student in Arabic reading comprehension. The program was costly, with only 50% of each grade advancing to the next. The size and budget of the program have diminished since 1970. The 1966 census indicated a literacy rate of 55% of the population.

There are a variety of other non-formal education programs, including centers for young rural girls under the Ministry of Social Affairs, social education centers under the National Union of Tunisian Women, and handicraft training centers under the Artisanat. These programs range in content from training for income-producing skills to more general social and homemaking education. While all of these programs have been operating for some time, there has been no attempt to evaluate their success, as measured by changes in practices and improvement in the lives of the target groups.

6. Educational Policies and Plans

In furtherance of the policy of universal primary education, the 1973-76 Plan is designed to provide primary school classrooms and teachers for 1,000,000 children in 1976/77. Qualitatively, the Plan anticipates improved efficiency through better primary teacher training, a revision of promotion policies and some changes in the curriculum, particularly the introduction of pre-vocational training in the last two years.

As previously noted, the major policy objective of the 1973-76 Plan with regard to secondary education is to achieve a greater emphasis on science, mathematics, technical and vocational training. Numbers of

* Now the Office of Tunisian Workers Abroad, Vocational Training and Employment.

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students are expected to increase to 200,000 in 1976/77, with most of this increase in the above tracks. To meet this increase in enrollment, Tunisian teachers in all fields will rise from 5,560 in 1973/74 to 6,280 in 1976/77, thus permitting a drop in foreign teachers from 1,810 to 890. The latter will still be needed to fill the gap in teaching mathematics, chemistry, physics and French. Tuition will remain free for all students.

Higher education enrollment under the Plan is expected to increase to 22,700 in 1976/77, with a major effort to concentrate this growth in scientific and technical disciplines. While tuition will remain free in all fields, scholarships to cover living costs will be increasingly redirected toward priority studies. Through this and other measures, a 226 percent increase is proposed in students at the Faculty of Science and in the scientific sections of the Higher Normal School, a 125 percent increase in medical students (from 1,000 to 2,250) and over a 600 percent increase in engineering students (from 340 to 2,120).

Capital costs of the education system will amount to about 40,000,000 dinars under the 1973-76 Plan, or 14 percent of the planned total investment. This excludes capital expenditures of 5,000,000 dinars for agricultural and vocational schools. Operational costs will rise by 8.4 percent to 72,000,000 dinars in 1976. As a percentage of the total national budget, both capital and operational costs will drop slightly from the prior Plan period.

7. Foreign Assistance

Tunisia has received a wide variety of non-U.S. assistance in support of its educational programs. France is supplying more than 2,000 teachers, and the Belgians and the USSR are also helping to meet this need. UN agencies have provided advisors and teaching equipment for development of programs at almost all levels, from literacy training to medical education. Capital assistance has come mainly from the IBRD/IDA, several Arab countries and Sweden.

U.S. public and private agencies have also been active. The Ford Foundation has assisted in public administration and English teaching programs, and the Peace Corps has provided many teachers. The National Science Foundation has granted US-owned surplus dinars to the University of Minnesota to develop a research capability at the Tunisian National School of Engineering and further grants of local currency in this area as well as a possible small A.I.D. research grant are a distinct possibility. A.I.D. has programmed PL 480 local currency for school construction, as well as other loans for both school construction and equipment.

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Current A.I.D assistance is concentrated in two technical assistance projects directed toward specific manpower needs. The first, under a contract with the University of Illinois, is developing a Graduate School of Business Administration at the University of Tunis. The second, through a contract with the University of Minnesota, is helping establish a modern department of economics in the University. Both have provided advisors, extensive participant training of faculty and some equipment and books. Implementation of both will be completed by June, 1978, with funding ceasing in FY 1977.

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IV. PROPOSED U.S. ASSISTANCE STRATEGY FOR TUNISIA'S SECOND DEVELOPMENT DECADE (1972-1981)

A. Historical Framework

The United States has maintained a bilateral assistance program in Tunisia since Independence in 1956. The overall goal of this program has been to assist Tunisia in achieving self-sustained economic growth. As indicated in Part II of this paper, Tunisia has made important strides in approaching this goal - particularly as a result of the increases in the prices of its major exports in 1973 and 1974.

Since the inception of bilateral aid to Tunisia, the United States has lent or granted to Tunisia AID-appropriated funds and PL 480 resources totaling somewhat over \$700 million. This substantial U.S. assistance program has been broken down as follows: PL 480 \$380 million, AID development loans \$197 million, AID grants \$137 million. The existence of a Special Economic and Technical Mission in Tunisia has underscored the importance the United States has attached to Tunisia's development since Independence. Furthermore, the Government of Tunisia has generally adopted effective development strategies and policies which permitted absorption of official aid in keeping with U.S. economic assistance criteria.

There were essentially two purposes to U.S. assistance programs in Tunisia during Tunisia's first development decade, i.e., 1962 to 1971. First of all, the United States was filling a resource gap during a period when Tunisia was largely dependent on substantial levels of external aid to finance investment. In fact, U.S. assistance during the 1960's was one of the principal external resources supporting Tunisia's investment program. The second purpose of our assistance since Tunisia's Independence has been to demonstrate that development objectives (increased incomes, increased production, more equitable distribution of development) in any sector of the economy can be better achieved through adaptation of improved technology and changed management practices. In general, U.S. technical assistance, training, and PL 480 grants had been related to the second purpose while PL 480 sales and development loans have been related to Tunisia's need for external financial aid.

USAID's technical assistance programs have been chosen with respect to U.S. capabilities and assistance priorities as well as Tunisia's development needs. In agriculture, for example, USAID has devoted a significant portion of our technical assistance to increasing production of bread wheat varieties, improvement in cereals and livestock

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production management practices, and training of extension agents. In public health, USAID has emphasized technical assistance and budgetary support to Tunisia's nationwide family planning program and new nutrition institute. In education, development of an indigenous capacity to train Tunisians in specific technical fields such as economics and business management has been an important objective of U.S. bilateral aid. This orientation has reflected in the past a judgment by both the GOT and USAID that these problem areas, among others, deserved high priority attention in allocation of U.S. bilateral assistance.

B. Revised U.S. Assistance Objectives

As a result of Tunisia's improved economic performance, a decline in AID resource availabilities, and the changing emphasis in AID world-wide strategy, overall U.S. assistance to Tunisia has been reduced rather markedly in the last several years. Tunisia no longer has a substantial resource gap either in terms of need for external financial assistance on the levels which obtained in previous years, nor in terms of its capacity to mobilize domestic savings to finance investment. Secondly, to the extent that Tunisia does rely upon outside capital assistance, as discussed in previous portions of this paper, these needs are being fulfilled by several other donors, most notably the World Bank group, France, the Federal Republic of Germany, and in the near future, based on recent agreements, by other oil producing states and the Arab Development Fund.

One can consider the current period of U.S. assistance in Tunisia starting in FY 72 as a new phase in which the purposes of U.S. assistance to this country have begun to change. The U.S. can now be less concerned with filling a resource gap to finance Tunisian investment and concentrate more appropriately on the changes required in technical assistance and project aid to adapt the AID program to Tunisia's second development decade. More specifically, the current need in Tunisia in the areas of agriculture, health, and education is for technical assistance programs and limited project grants and loans which help Tunisia adapt existing technology and make other critical institutional and management reforms, particularly as they relate to programs in the more remote underdeveloped regions of the country. While the possibility of a future need for U.S. financial assistance cannot be ruled out, given the fragile nature of Tunisia's economy, the USAID does not anticipate such a requirement over the short term.

C. Sectoral Strategies

Part III above covered summary discussions of three sectors of AID project activity and set forth USAID's perception of what some of the

principal development constraints are in each of these sectors. A fuller treatment of historical trends in each of the sectors, GOT policies and priorities, institutional strengths and weaknesses, and major development constraints are treated in the attached annexes. In this section, USAID will attempt to spell out some possible new approaches to AID assistance activities in each of the sectors concerned which would serve to adapt U.S. bilateral aid to the current state of Tunisian development.

1. Agriculture

In Part III.A. above, the USAID concluded that Tunisia's principal development problems in the agriculture sector related to environmental issues, institutional problems, and policy problems which must be overcome if Tunisia is to attain sustained growth in that sector. Tunisia has some of the environmental problems associated with arid zone agriculture, i.e., a large percentage of its land is unusable for agricultural purposes without uneconomic levels of investment. Tunisia is subject to regular periodic droughts even in the non-arid zones in the North, and has an insufficient supply and an inadequate distribution of water for irrigation purposes.

Extension and research activities are directly benefiting only a small percentage of the farm population, and mobilization of agricultural inputs - seed, fertilizer, machinery, etc. - is inadequate. Pricing and subsidization policies appear to be oriented more toward benefiting urban consumers than increasing farmer incomes. Lack of availability of credit for small farmers and deficiencies in the marketing system are becoming increasingly important as other constraints are relaxed. The slow pace at which land tenure problems are being resolved, dating back to Independence, has resulted in some uncertainty, particularly among the small farmers whom the Government is trying to reach through a variety of programs. Overlaying all of these problems, the Tunisian educational system is turning out an insufficient number of people with appropriate training at various levels to fill the demand for highly-trained personnel in the agricultural sector.

The USAID proposes the following approach to agricultural assistance programs over the next three to five years:

a. The indirect approach to resolving planning and policy constraints, i.e., building up the planning and applied research capability of the Ministry of Agriculture through a contract with the University of Minnesota, continues to be a practical course to follow. It is having a very high payoff now that trained agricultural economists are returning from the United States to fill critical planning and research positions in the Ministry. The activity is scheduled to terminate in FY 1978.

b. The USAID recommends continuing current emphasis on livestock production in Tunisia; however, a FROP revision to be submitted in December 1974 calls for the project to be revised to focus exclusively on livestock extension problems and development of an indigenous capacity at the regional level to carry out extension programs. USAID may be able to adapt this project to smaller farm units, particularly in the context of sheep production, as the project enters its last phase (FY 1976 through 1981).

c. The Integrated Agriculture Development project in Jendouba is now being reexamined to assure GOT/USAID agreement on the purposes and design of this activity. The project purpose is to increase small farmer incomes through a series of simultaneous related actions addressing the full range of constraints the producer in the Jendouba-Ghardimaou upper valley faces in attaining access to production inputs, extension, credit, and markets for his goods.

d. The GOT places the highest priority on seeking improved ways to stimulate economic growth in the remote rural gouvernorats (regions) of Tunisia. Recognizing agriculture must be a central theme, the Government is asking donor countries to assist in developing integrated multi-sector programs for rural development. The USAID is examining various possibilities for responding to this urgent need in remote areas of either the Center or South. A PRP will be submitted by the end of January 1975.

e. USAID's review indicates that a greater effort is required to apply existing technology and research to the needs of all producers, but especially the small farmer. Tunisia has only achieved modest advances, for example, in cereals production on its small and medium sized farms. Application of technology and other incentives to increase cereals and introduce high protein legume production on these units is of critical importance. If an AID-assisted rural development activity is launched, including an agricultural component, application of technology and improved extension programs reaching small farmers will be an important theme. Secondly, USAID will explore with AID/TAB the possibility of expanding Tunisian research in grain legumes through linkage to other worldwide research programs.

f. In agriculture education, the GOT and the University of Minnesota have held preliminary discussions on establishing a master's degree program at the National Agricultural School, through exchange of professors, consultant visits, and participant training. USAID is reviewing this proposal and may recommend partial AID financing of such a program in the near future.

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2. Public Health

USAID's sector discussion in Section III.B. above and the fuller treatment contained in Annex B establishes that the principal problems in Tunisia's health sector are associated with environmental health (including sanitation, nutrition, and preventive health programs) and long-term planning and manpower development. Experts in the international health field generally agree that the developing countries cannot achieve substantial improvement in the status of public health in their countries, comparable to European or North American standards, unless significant improvements occur in the areas of improved nutrition and environmental sanitation coupled with acceptance of programs to reduce population growth. USAID proposes that U.S. development assistance programs in Tunisia be confined to demonstrating new approaches to overcoming this set of environmental constraints. More specifically:

a. Tunisia will require assistance in improving nutrition planning and to adapt nutrition education programs and agriculture production policies to its needs. A PRP for a Nutrition Planning project will be submitted in January 1975.

b. In support of (a) above, PL 480 Title II programs will concentrate on reaching young children and pregnant and nursing mothers through the existing municipal and rural health infrastructure. Some technical assistance, perhaps through the Volags CARE and CRS, to improve and expand this infrastructure may be required. Primary school feeding under PL 480 Title II will be phased out over the next few years.

c. Family planning assistance should continue; however, given the number of donors active in this field, our assistance should become increasingly more selective - concentrating on specific problems of program implementation - rather than overall budgetary support.

d. USAID should explore possible new assistance interventions in environmental sanitation, in coordination with the new Tunisian National Office of Environmental Sanitation. One FVO, CARE/MEDICO, is already active in this field supported in the past by PL 480 Section 204 funding; and, it is proposed to expand CARE/MEDICO's role through FVO dollar grants.

e. The adaptation of (a) through (d) above and improved use of non-physician personnel in health care delivery is under consideration in the Mission as part of an integrated rural development program. Program management and policy changes promoted by USAID in the past at the national level should now be adapted to selective regional areas on a pilot demonstration basis.

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f. The new Sousse and Sfax regional medical schools would be excellent candidates for innovative public health education programs. USAID may recommend in the near future that a joint WHO/USAID activity be explored to improve public health education in one of these new medical facilities through establishment of a department of public health.

3. Education and Manpower Development

USAID does not foresee a likely role for new U.S. assistance programs in the formal education structure at the primary and secondary levels. It appears, however, that a new approach might be desirable and fitting with respect to non-formal training programs. Secondly, our current activities in higher education will be terminating over the next few years and, given the magnitude of manpower constraints particularly in the scientific and technical fields, our future role at that level requires reexamination.

USAID proposes the following approach in the educational sector:

a. USAID should move ahead with its exploration of non-formal education as a possible ingredient in a new project for integrated rural development. Given the active role of the National Womens Union in Tunisia and clear evidence that the current formal educational structure has not reached sufficient numbers of rural women, particular emphasis will be given to programs which emphasize womens' training in this context.

b. The USAID plans to phase out its current Economics Education and Management Education projects over the next two years. Nevertheless, given the importance of Management Education to the economy and the GOT's decision to move a substantial portion of its educational infrastructure to regional areas outside of Tunis, the USAID proposes to review with the GOT adaptation of our Management Education activity to a regional school. The Minister of Education has requested USAID to consider assistance in the development of a new management school as part of the university being set up in Sfax.

c. In agricultural education, it was noted in Part IV.C.2. above that a master's degree program at the National Agricultural School is under consideration. Given the critical shortage of trained agricultural personnel in Tunisia, USAID believes this proposal warrants our careful review.

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D. U.S. Assistance Options

1. Levels of Assistance

In conformity with reduced AID availabilities, improved Tunisian economic performance, and our changing assistance objectives, U.S. concessional aid to Tunisia has declined rapidly in recent years. From a level in FY 72 of \$40 million in AID-appropriated and PL 480 grants and loans, U.S. assistance declined to \$17 million in FY 73 and \$8 million in FY 74. In FY 75, U.S. bilateral assistance will approach between \$6 to \$8 million, consisting primarily of AID and PL 480 Title II dollar and commodity grants, and very modest local currency grants under PL 480 Section 104(h).

USAID is now at a point where it must examine where this trend is to lead. In terms of external resource needs, Tunisia's future depends on the extent to which the recent favorable turn in the terms of trade continues and, most importantly, the magnitude of future petroleum exports. These questions will not have answers for two or three more years. In the meantime, however, it appears that, barring an unusual succession of bad crop years or an unexpectedly abrupt fall in price of major exports, Tunisia's financial resource needs should be met through its own production and exports, already programmed concessional foreign assistance, non-concessional financing (loans and investment) increasingly available to the country, and, if necessary, some drawdown of exchange reserves.

Tunisia's current development problem - and the one that concerns AID - is the mobilization of these financial resources to bring them to bear on the key issues of employment creation and improvement of the distribution of the benefits of economic growth both among different income groups and among different regions of the country. This mobilization for optimal use of resources involves, to a large extent, the use of improved technology, changed management practices, policy and institutional changes, and training. These are areas in which the U.S. has a unique role to play. Furthermore, the GOT, by and large, agrees that these are the principal problem areas, and is aware of the unevenness of its development process, particularly with respect to the remote regions of the West and South.

Given Tunisia's serious desire to confront this set of development constraints, it appears contrary to U.S. interests for AID to disengage completely from Tunisia's development process. We have long been associated with Tunisia's development programs and this country is now at a stage when there is probably an even greater need

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than in the past for external technical assistance and technology transfer precisely in those areas where the United States has the technological lead. Encouraging U.S. private investors to become more active in Tunisia can assist in this effort with respect to the economy as a whole, but continued access to AID assistance, together with other donors, will be required if Tunisia is to come up with a viable approach to the development constraints identified in this paper in agriculture, health, and education. To assist in this effort, the USAID Mission can foresee for the next three to five years a continuing U.S. bilateral assistance role where permitted by AID worldwide strategy at approximately the following levels:

a. Technical assistance (grants and loans) and project loans averaging between \$3 to \$5 million annually.

b. PL 480 Title II commodity assistance on a reduced scale coordinated with nutrition education programs targeted essentially on young children, pregnant and nursing mothers. As the primary school feeding program is phased out over the next few years, this revised approach would reduce Title II assistance from around \$4 million annually to approximately \$2 million.

c. Occasional PL 480 Title I sales agreements, particularly for soybean oil, may be justifiable. Tunisia has a steadily climbing import demand for soybean oil and Title I sales on concessional terms are recommended when this commodity is in adequate supply.

d. Non-project lending under AID auspices is unlikely over this time period. Program loans cannot be justified barring an unforeseen worsening of Tunisia's balance of payments position. The GOT's favorable budgetary situation would appear to exclude sector loans.

2. Modes of U.S. Assistance

The United States can and should begin to reexamine the modes for delivering U.S. assistance to Tunisia. The USAID would recommend a gradual transition over the next few years from grant aid managed through a traditional Mission structure to less concessional forms of assistance, such as loans to finance technical assistance as well as capital inputs, and perhaps eventually reimbursable technical assistance if the Tunisian economy rapidly improves. In addition to moving toward less concessional aid, the USAID would recommend, where possible, that the block grant approach to delivering technical assistance be explored with the Tunisians.

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The USAID can foresee three approaches to delivering our technical assistance in the future which, taken together, would have the effect of both partially reducing the concessionality of U.S. aid as well as withdrawing gradually our direct involvement in the management of assistance inputs. These approaches are discussed below.

a. Project Lending

Several of the proposals indicated in the sector strategy section (Part IV.C. above) refer to new activities to be carried out with existing Tunisian institutions or on-going GOT programs. In those instances, the USAID should explore with the GOT the possibility of adopting project loans for technical assistance rather than Mission-managed technical assistance grants. For example, the GOT has created with USAID assistance an indigenous structure for business education within the University of Tunis, and an extension of business management education to a regional area would be a good candidate for a technical assistance loan. The USAID recommended the possibility of exploring with WHO limited technical assistance for establishing a department of public health in one of the new regional medical facilities. Here again, our role might best be confined to supplementing a WHO or other donor activity through loan financing of technical assistance, equipment, and training inputs.

b. Reducing Mission Management over Project Grants

Different measures need to be explored over the next few years to reduce the need for extensive Mission management over grant program inputs. One possibility would be phasing over to the bloc grant approach with respect to our current assistance to the Office of Family Planning. This approach would relieve the USAID Mission of direct involvement in the difficult institutional/managerial problems Tunisia faces in carrying out its family planning program; however, admittedly there is the risk that this step would lead to less effective aid. The bloc grant approach, in reducing U.S. leverage, might make our involvement easier, but also less meaningful. USAID needs to explore this approach carefully to see how one might phase over from Mission-managed technical assistance to GOT-managed assistance, and the family planning program is one suggested area for initial examination. A full exploration of AID experience and problems with this mode of assistance would be required before finally deciding whether family planning is the right area in which to start.

As another means of reducing direct Mission management of technical assistance, USAID proposes maximum use of PVO grants. The Mission has already recommended one grant to CARE/MEDICO for continuation

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of its wells construction and renovation projects in Tunisia, and it is proposed to utilize PVO grants as a means to provide continued limited assistance in this general area of environmental sanitation. Any further assistance in agricultural education would also be considered either as a direct bloc grant to the Tunisian agricultural institution involved, or under a university contract.

c. Mission-Managed Technical Assistance

As current AID technical assistance projects are terminated in Tunisia, the USAID would propose that direct Mission management of new technical assistance grants be considered primarily where GOT institutional structures for managing development programs are weak or non-existent - i.e., in the cases of integrated rural development and nutrition planning. In the former case, a purpose of the project would be to assist the GOT in creating effective regional institutional structures and management approaches to integrated rural development. Since there is no single GOT counterpart with responsibility for planning and implementing regional rural development, it would be premature for the Mission to consider either a bloc grant or technical assistance loan approach. Similarly, in the case of nutrition planning, this project would involve a coordination and integration of agricultural production policies and public health nutrition programs. Since it is an inter-sectoral problem, the project should begin as a direct Mission-managed or contract technical assistance activity, with the possibility of phasing this activity over to a loan or bloc grant managed by the GOT as a Tunisian institutional capacity for managing the project is achieved.

3. Options

Although U.S. bilateral assistance has declined fairly rapidly in Tunisia, the GOT has demonstrated a remarkable acceptance and understanding of this reduction and, at the same time, a desire to maintain AID involvement in its development process. The USAID believes that the case is strong for maintaining this involvement over the next three to five years, although there should be some fundamental changes in our program during that period.

Essentially, there are three important elements - level, mode, and concessionality - that must be examined in determining U.S. options for the future of the economic assistance program in Tunisia. Considering that each of these elements is somewhat independent, they must be considered separately in the context of improved Tunisian economic status and self-management capability, current U.S. resource

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availabilities, and U.S. Congressional program policy guidelines. Subsequently, this process would be followed by commensurate adjustments in the level, mode, and concessionality of the USAID program. In sections D.(1) and (2) above, various ideas have been suggested for modifying the program according to USAID's interpretation and analysis of the factors just mentioned. Accordingly, there has been an attempt to identify the more probable paths which the program might follow.

The variables mentioned above must be considered with respect to what appear to the USAID as three possible options, any one of which could govern U.S. bilateral assistance strategy over the next three to five years, assuming economic growth projections are realized. Essentially, the USG should now adopt an assistance strategy for the coming three to five years designed either to:

- (1) Phase out U.S. assistance to Tunisia;
- (2) Continue the current program of technical grants, loans and PL 480 with no major change in aid levels or in our assistance methodology; or
- (3) Continue assistance, but, where possible, reduce our direct management of aid inputs and gradually reduce the concessional nature of aid.

A phaseout over the short to medium term of the rest of AID's limited technical assistance and PL 480 programs in Tunisia could possibly be accomplished without posing major problems with respect to implementation of Tunisia's development plans, although it would raise political and economic problems of a larger nature. Tunisia would be less likely to choose U.S. technology and expertise without some concessional aid as a stimulant to developing and expanding our economic relations. Furthermore, given our substantial long-term involvement in and partial responsibility for the direction of development in Tunisia, it would not appear desirable to foreclose new assistance activities when the evidence clearly demonstrates the need for and GOT interest in continued external technical aid of a type the United States is uniquely qualified to provide.

If the USG were, nevertheless, to elect a phaseout program for Tunisia now, it could be undertaken in various ways, including various mixes of the elements - level, mode, and concessionality. One alternative would be more rapid phasedown of PL 480 Title II (particularly the primary school program). Another approach would be

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to limit our program interests to one sectoral area - e.g., consider no new assistance activities in health and education, and terminate current activities in those sectors as scheduled. Bloc grants and technical assistance loans could be considered methods of completing on-going projects while adopting a phaseout plan. None of these approaches, however, would permit sufficient time and flexibility to respond with U.S. assistance in a limited fashion to the set of institutional, managerial and manpower constraints which Tunisia now faces in all three sectors which we have reviewed. A more rapid phaseout of PL 430 Title II, in addition, would impose serious short-term budgetary constraints in the education sector, and problems of adjustment for the two PVO program managers - CARE and CRS. Considering Tunisia's current economic situation, phaseout now might also lead to an adverse political reaction with the GOT questioning the meaning of our phaseout and the constancy and value of Tunisia's close relations with the United States.

Secondly, the USG could elect to continue the current minimal level of assistance without major change in our assistance methodology. This approach would certainly be the easiest since it would involve introduction of a few select activities as current projects terminate, without a major change in the way USAID manages its program, and without the problems of increased cost to the GOT of U.S. assistance relative to other donor programs which would arise as less concessional aid is introduced. Maintaining the current program mix over a three to five year period would also be less disruptive to GOT development planning. On the other hand, such a course would not recognize Tunisia's improved financial position and probable capacity to manage a greater portion of U.S. assistance programs.

Thirdly, adopting a course which emphasizes new approaches to delivering assistance, and particularly less reliance on direct grants, would not be an easy course to negotiate with the GOT, considering the substantial U.S. assistance reductions recently undertaken. Although less serious than an aid phaseout, it would probably raise some political considerations and also, to a lesser degree than with phaseout, would raise the question of relative cost of USG vs. other donor technical assistance in Tunisia's view. It would pose problems of assistance management, as well as cost, requiring Tunisia's bureaucratic machinery to assume additional aid management responsibilities previously handled by our economic mission. (Tunisia's recent agreement to continue Trust Fund support to the Mission is evidence of their desire to maintain reliance on the current structure for management of assistance inputs.) Admittedly, reducing our management role has risks, and could result in less effective programs.

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Particularly if USAID maintains its current level of assistance, however, gradually revising assistance modes and moving toward occasional technical assistance loans does have the distinct advantage of being a more flexible and pragmatic course. It recognizes not only our reduced ability to deliver grant aid at levels which obtained in the past but also Tunisia's improving capacity to manage its own affairs. Applied selectively, it would permit introduction of assistance modes adapted to GOT needs and would recognize that the development process is uneven. Together with deferral of a firm phase-out date, subject of course to no major change in Tunisia's economic prospects, such a course would permit continued but limited GOT access to U.S. technology and expertise in implementing its coming Five-Year Plan (1977-1981). It is this latter course which USAID recommends.

Continued assessment over the next two years will be required to determine if USAID is on the appropriate course. If a marked upswing in Tunisia's economy occurs, serious consideration should be given to a phaseout target date. If, on the other hand, a substantial increase in Tunisia's petroleum exports does not occur, or other unforeseen factors arise, our present judgment with respect to program and sector lending may have to be revised, and the speed with which we convert the grant program to other forms of assistance reconsidered. Based on the present promising, but fragile, state of the economy and Tunisia's evident need for continued assistance, however, USAID concludes that the desirable course is to pursue our program at approximately current levels, while selectively reducing direct management of aid inputs and gradually reducing the concessional nature of the program.

E. Program and Manpower Implications

In Part IV.D.1, USAID recommended continuation of a limited technical assistance grant and loan program at the \$3-\$5 million level annually, reduced PL 480 Title II programs, and occasional Title I sales as can, from time to time, be justified. No further non-project lending of either a program or sectoral nature is recommended during the three to five year period ahead of us, barring unforeseen circumstances. In addition, USAID plans to reduce selectively the concessionality and direct Mission management of U.S. assistance, on a gradual basis. This strategy calls for some revision in the financial and manpower projections contained in the FY 1976 FBS.

In Food Production and Nutrition, the grant program projected for FY 1976 will remain essentially as planned. The cereals project will terminate in FY 1976, but the Mission will examine with the GOT the problem of applying technology in cereals and legume production

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to the small farmer, perhaps within an integrated rural development activity. By FY 1978, current AID projects associated with the Nutrition Institute and lysine research will have been terminated and the current University of Minnesota contract for agricultural research and planning will be terminally funded in that fiscal year. PL 480 Title II programs will be phased down and coordinated with nutrition education programs targeted on young children, pregnant and nursing mothers. By FY 1980, it is likely that only the livestock extension project and reduced PL 480 Title II programs among on-going USAID activities in the food and nutrition category will be active. With respect to new starts, a nutrition planning activity may be launched in FY 1975 subject to PRP and PROP approval later this fiscal year. The integrated rural development project is scheduled to begin in FY 1976, and a new contract or bloc grant in agricultural education may be recommended in the near future.

Concerning new loans, the USAID has recommended against a grain storage loan in FY 1975, as was originally conceived, based upon the Kansas State University Report completed in September 1974.* The Mission no longer anticipates a \$10 million sector loan for FY 1976; however, as agreed upon in the FBS Reviews this year, the Mission may recommend a small project loan to finance a portion of the rural development activity.

The Family Planning project is scheduled to phase out by FY 1977. The Mission will explore the possibility of phasing over management of this program to the GOT in either FY 1976 or FY 1977, perhaps through a bloc grant. For any new activities launched in the areas of environmental sanitation or public health education, preference would be given to the PVO grant formula or perhaps project lending (including technical assistance). Similarly, technical assistance and training under the current economics education and business management programs will terminate in FY 1976 and 1977, respectively. A project loan for technical assistance may be considered with respect to the new business education program at the University at Sfax. Any new program in the area of non-formal education will be linked to on-going activities or, most probably, the new integrated rural development project. In this latter context, non-formal skills training and related activities which promote the role of rural women will be emphasized.

*Although the KSU report indicated no requirement for on-the-farm storage, consideration may be given by the GOT to improvement of storage facilities in the major cereals producing areas.

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The USAID anticipates that, if properly phased, the above grant and limited project lending projections can be accomplished within an average annual level of \$3-5 million over the next five years. FY 1976-78 will constitute a transition from ongoing to new activities, and total annual obligations will probably run higher during that period than toward the end of the decade.

The USAID's manpower requirements will continue to change reflecting the above revisions to the program, and particularly the phase-over to less concessional aid. USAID would not recommend further major reductions in direct hire staff during the coming period of program transition (FY 1976-78). Subsequently, however, the Mission staff could be substantially reduced in total numbers of direct hire personnel, with technical expertise obtained essentially through PASA, contract and PVO arrangements. If the bloc grant and/or technical assistance loan approach proves viable, some of the required implementing contracts would be with the GOT, permitting a lower level of USAID Mission control and involvement.

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ANNEX A

A SURVEY OF THE TUNISIAN
AGRICULTURAL SITUATION

This report was prepared by
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I. INTRODUCTION

A. Objectives and Procedures

The objectives for this statement on the agricultural sector are to: assess its performance; identify areas of strengths and weaknesses; and summarize development constraints as a framework for future U.S. strategy.

B. Geography and Climate

Tunisia is the smallest of the North African countries, covering 163,170 square kilometers of which some 5,000,000 hectares are in farms. Its coastline extends a distance of 1,199 kilometers in a general south-easterly direction.

The climate of Tunisia has a critical influence on the country's agriculture. The climate is influenced by the Mediterranean Sea to the North, the Sahara desert to the South, and the Atlas mountains to the West and Southwest. Tunisia can be divided into three major regions: The Northern Region which lies between the Mediterranean and the southern dorsal of the Atlas mountains which extends from Algeria; the Central Region, which is a plateau between the North and South; and the Southern Region which unites with the Sahara desert.

The Northern Region comprises about 25 percent of the country and contains Tunisia's principal and only perennial river, the Medjerdah. The average rainfall is 400 - 600 mm per year (16-24 inches), reaching 1000 mm (40 inches) in the mountains near the Algerian border. The rainfall and its distribution from September to about May make the region ideally suitable for production of winter cereals which are harvested in the dry summer months. This is Tunisia's most important agricultural region.

About 80% of the country's wheat is grown in the Northern region, as are much of the vegetables, forage crops, and deciduous fruits. This region contains most of the water resources of the country, has most of the developed irrigation, and offers the best possibilities for expanding irrigation. Winter frost limits the potential of much of the region for winter vegetables and fruits. However, these crops can be grown in the late fall and early spring.

The Central Region is an area of high plateaux and hills separated from the North by a range of hills up to 500 meters in height. Annual rainfall here averages about 400 mm. Irrigation possibilities are limited. This area is devoted to the grazing of livestock.

A relatively small sub-region, called the Sahel, includes Cap Bon and the coastal plain south to Sfax and beyond. This sub-region has little rainfall, and most crops other than olives and almonds require irrigation. The region's soils, warm winters, and coastal moisture make it ideal

for olives. A major portion of Tunisia's olives are produced in this region. Other fruits and vegetables do well where irrigation is possible, although these possibilities are limited.

Cap Bon in the Sahel produces most of Tunisia's citrus fruits, using pump irrigation from wells.

The Southern Region is a pre-desert zone with less than 100 mm of rainfall a year. Some dry land barley and wheat are grown during years of rainfall, but production is marginal. Most of the agriculture of the region is around oases where irrigated dates, wheat, and vegetables are grown.

The Southern Region is important for phosphate rock, which is mined and processed for phosphate fertilizer, and for oil and other minerals.

In general, Tunisia's climate is irregular, causing wide fluctuations of agricultural production. The pattern of rainfall since 1900 has shown a trend of two good years for crops, two poor years, and one year of drought, causing crop failures. Floods are also a hazard to agriculture. The devastating flood of 1969 destroyed crops and a large number of livestock.

II. PERFORMANCE OF THE AGRICULTURAL SECTOR

A. Role in the Economy

1. Contribution to GDP

In the early 1960's, agriculture contributed 23-24% of Tunisia's Gross Domestic Product (see Table 1). During the disastrous years 1966-1967, this contribution fell off sharply, reaching a low of 14.7% in the latter year. Over the next 5 years the agricultural share of GDP averaged 17.9% within a range of 16.1% to 20.6%. It is worth noting that even the record 1971-72 crop year was barely sufficient to pull the share above 20%. Last year saw the share fall back to 16.1%, and in 1974 it is estimated to be about the same. With due allowance for unusual weather conditions, agriculture thus gives the appearance of having stabilized its contribution to GDP at about 18%. Maintaining this position within an economy that is projected to grow at an annual rate of about 9% over the next two years will be difficult, however. Current Ministry of Plan projections do, in fact, show the agricultural share of GDP declining to 16.3% in 1975 and 16.2% in 1976.

2. Contribution to Exchange Earnings

Over the period 1962-1970 exports of agricultural products, processed and unprocessed, ranged between TD 30 million and TD 35 million annually. (See Table 2.) The past four years, however, show significant

increases (except for a dip in 1973) with an amount of TD 82.6 million estimated for 1974.

In relative terms, the trend has been somewhat different. Agricultural products accounted for about two-thirds of all Tunisian goods exports in the early 1960's. The percentage dropped off sharply thereafter, and, except for 1972 when it jumped to 44%, amounted to around one-third during the period 1967-1973. In 1974, despite a 50% increase in agricultural exports, the sector's share in the total is expected to decline further to about one-fourth, as the value of overall exports more than doubles in response to price increases for petroleum and phosphates.

Olive oil has consistently been the most important agricultural export over the last decade, accounting for anywhere from 27% to 70% (as in 1972 and 1974) of agricultural exports. Wine, which rivaled olive oil in the early 1960's has declined in importance, although it remains the second most important agricultural export. Among unprocessed commodities, cereals were the most important in the first half of the 1960's. They have since become an insignificant item, and Tunisia increasingly has become a net importer of cereals. Citrus has generally maintained the same level over the past 12 years, while almonds and fish have shown significant growth in percentage terms. Their total value, however, remains small.

3. Foreign Exchange Costs

Food imports remained stable at about TD 20 million annually during the first half of the 1960's (see Table 3). They then grew rapidly, approximately doubling in value by the end of the decade. A three-year period of stability at the new level was followed by a 20% increase in 1973. They are estimated to have nearly doubled in 1974 as a result of massive increases in the prices of sugar, wheat, and vegetable oil.

Despite the fact that wheat is the principal agricultural product of Tunisia, this commodity has consistently been the most important food import, accounting each year for between one-fourth and one-third of such imports. Most of the wheat imported is bread wheat. Except in poor crop years, the country produces enough durum wheat for domestic consumption and in some years even has had a surplus for export. The same is true for barley. In the early 1960's, vegetable oil began to be imported (under the PL 480 Title I program) for mixing with olive oil for domestic consumption in order to increase the amount of higher-priced olive oil available for export. As consumer acceptance increased, imports of vegetable oil grew rapidly until it became the second most important food import. With rising incomes in recent years, demand for sugar has grown rapidly. Sugar imports more than doubled between 1969 and 1972, and this year's price increase has driven the cost up to a point where it

has become a matter of concern to the Government, both from the point of view of the balance of payments and from that of the fiscal burden of subsidizing the price to the consumer.

Non-food agricultural commodity imports consist primarily of cotton, wool, and hides/leather. Although continuing to be of little relative importance within the total import bill, these imports have increased rapidly, particularly with development of the textile industry.

Imports of agricultural inputs do not appear to have increased significantly during the 1960's, although the figures shown in Table 3 should be treated somewhat skeptically, since the category of agricultural machinery apparently does not include irrigation pumps and equipment, imports of which were substantial during the period. In addition, imports of insecticides and herbicides, which may run about 300-400,000 dinars a year, are not shown, and seeds and livestock feed are included under food. In any case, agricultural machinery imports expanded rapidly in recent years, more than tripling in value between 1969 and 1973. Fertilizer imports have shown a much more irregular pattern. The large jump estimated for 1974 is attributable both to price increases and to a 50% increase in volume.

On balance, beginning in 1967 Tunisia shifted from its historical role of a net exporter to become a net importer of agricultural goods. The average annual deficit for the five years 1967-1971 amounted to about TD 15 million. The unusually good crop year of 1972 resulted in an exception to this new pattern, but the deficit reappeared in 1973, and 1974 shifts in the terms of trade for agricultural goods operated to Tunisia's disadvantage so that the deficit is estimated to have grown to TD 35 million.

A similar pattern has prevailed for food commodities alone, although the amount of the deficit has been significantly less.

B. Recent Growth as Compared to the Decade 1962-1971

Tunisia's national accounts series was revised in 1973, and the revision has been carried back only as far as 1963. It is, therefore, not possible to make a direct comparison of the value of agricultural production for periods before 1963 and those after that date. One can, however, make a general comparison between growth rates for the agricultural sector as indicated by the two different series.

Such a comparison shows a marked contrast between the stagnation experienced in the sector during the First Development Decade (1962-1971) and the impressive growth, shown by the sector in the past four years. The average annual growth rate for the value added to gross national product by the agricultural sector during the First Decade was a negative 1.8 percent, even despite a large increase in the last year of the period. (See Table 4.) Since 1970, however, agricultural growth, including one bad year out of four, has averaged 15 percent. (See Table 5.)

C. Performance by Crops and Livestock

1. Comparison of the Sub-Sectors.

A comparison of the three principal agricultural sub-sectors, cereals, olives and livestock annually for the decade 1962-1971 is shown in Table 6 which is expressed in terms of added value at constant 1966 prices. The table clearly shows the fluctuations of all three sub-sectors. The droughts of 1961 and 1967 and the floods in 1969 had a drastic effect on production of all three sectors.

Of historical significance was the gradual decline of all sub-sectors from 1964, when the French departed Tunisia, and through 1969 when the Government socialized all productive resources and marketing infrastructure into state controlled cooperatives. This policy, the lack of trained Tunisians to take over the economy of the country, and the losses due to bad weather were all factors contributing to the negative growth of agriculture during the decade.

During the years 1972-1974, all sub-sectors have shown significant improvements, as shown in Table 7.

Important shifts in the uses of land have occurred. Application of improved technology has resulted in increased production with the same or less land for some crops, such as wheat. This has resulted in an increase in land devoted to other crops as, for example, vegetables, barley, and forage crops. The area devoted to all cereals decreased by 275,000 hectares from 1964 to 1974, (see Table 3) but this smaller area was still 200,000-300,000 hectares more than in the mid-1960's.

2. Cereals

Cereals production declined between 1964 and 1969 when the Government changed its policy toward nationalization of all resources. Production dropped to an all time low of 497,000 MT's in 1969. Beginning in 1970, production gradually increased and reached a peak in 1972 (1971-72 crop). This increase was due to generally favorable weather, expanding use of high yielding varieties, increased prices and favorable policies toward the private sector.

3. Livestock

Government statistics show that livestock production increased rapidly from 1971 to 1974.² However, the extent of the animal population in the five northern governorates was not realized until a recent USAID financed livestock survey in 1974. Before the survey, the animal population on state and cooperative farms was well known. However, the population in the private sector had only been estimated. The survey showed 570,000 head of cattle and 2,319,000 head of sheep in the five northern governorates. The Tunisians estimate that this represents 80% of

the livestock and 50% of the sheep in the country. The Ministry of Agriculture's statistics on animal production (meat and other production) have been readjusted for the years 1970-1974, inclusive, to reflect these new figures. (See Table 9.)

Some important aspects of the enumerative livestock survey are summarized below.

The survey showed that 30% of the sheep and 20% of the cattle surveyed in the five northern governorates are owned by landless people. They graze their livestock along roads and in fields of stubble, moving them north or south at the change of seasons.

Among cattle owners, 85% own an average of 3 head of cattle, and 15% own less than 20 head of sheep. Operators who own both sheep and cattle accounted for 4/5 of the sheep population, 4/5 of the area cultivated in cereals, 95% of the area producing hay, and 3/5 of the area producing forage. The survey reported 25% of the total crop area in fallow, amounting to 418,453 hectares.

The USAID sponsored Livestock Study in 1974^{3/} recommended that the sheep population be reduced by 20% and that the goat population also be reduced considerably to reduce overgrazing of pastures and soil erosion. The report recommends increased production of feed grains, forage crops, planting of pasture grasses, and increased feeding of animals as a means of increasing meat production per animal.

4. Olives

Olives are well suited to the soils and climate of Tunisia, particularly in the coastal plain extending from south of Tunis to Sousse and Sfax.

Although there are records and evidence of cultivation of the crop dating back to the Roman Period, the French expanded olive production in Tunisia. Thanks to the imports of other vegetable oils for domestic consumption, Tunisia has been able to increase exports and in the latter part of the 1960's Tunisia ranked second only to Spain in export of oils.

Olive production has made impressive gains during the years 1971, 1972 and 1973 (see Table 10). A record was set in 1972, when production reached 900,000 MT's of olives. This amount of production yielded 130,000 MT's of oil.

There appear to have been factors other than weather which have maintained even off-year production at higher levels than in the past. A survey conducted by the National Institute of Statistics during the harvest of the 1974 crop (1973-74 harvest) revealed that 55% of the trees were heavily laden and 45% of the trees had very little olives. ^{4/} This would indicate that the program of uprooting old trees and replanting with young seedlings and expanding the area in olives which took place in the 1960's is **succeeding**.

In 1961, there were 787,000 hectares of olive trees in Tunisia. In 1971, there were 1,059,400 hectares, an increase of 272,400 hectares. The replacement program replaced 59,000 hectares, making the total area in new trees 331,400.

As it takes about seven years for an olive tree to produce fruit, trees planted in the early part of the decade were producing by the end of the decade, influencing production levels and improved stability of production.

The Government has continued its program of encouraging expansion of area devoted to olives, and the rejuvenation of old orchards. This program receives priority in the use of credit from the FOSDA fund in the Banque Nationale de Tunisie (BNT) for investments.

In addition to expansion and rejuvenation, for the first time under the guidance of FAO-SIDA, efforts are being made to increase yields by developing new varieties. A program of grafting has been started on 34,000 hectares, principally in the north. The use of nitrogen fertilizer is scheduled for this program for 1975. Also FAO-SIDA and the Office of Oils are sponsoring a program for developing an integrated industry of production and processing. This program will regenerate 12,000 hectares in the 1974-75 crop.

5. Fruits and Nuts

Citrus fruits, dates, wine and table grapes, and almonds comprise the principal fruit and nut crops. Much of the fruits are grown under irrigation in the Cap Bon area. Grapes are grown without irrigation in some areas in the north but do best under irrigation. Much of the almond crop is grown without irrigation.

Citrus production has ranged between 75,000 MT and 120,000 MT during the five years 1970-1974. This was the pattern during the past decade.

Almond production has expanded considerably, due to both increased plantings and good weather.

Grape production has expanded annually during the five year period. This is true of both table and wine grapes. While undoubtedly weather has been a factor, improved prices of wines in Europe have encouraged the Government to promote the industry and have provided greater incentive to private producers.

In 1970-71, the EEC policy toward wine imports from Tunisia was unfavorable, and the price was so low for grape growers that the Government started a program to convert vineyards at the rate of 1000 hectares per year. This policy has been discontinued. Expansion of the area in vineyards is being encouraged by the Government. Also the Government, in response to private demand is designating some vineyards for production of "appellation controlée", or vintage wines, with bottling at the "cave".

6. Vegetable Production

All vegetable production has improved annually during the five year period 1970-1974. Tomato production has boomed. There have been large increases of all vegetables except potatoes. More importantly, there have been increases in off-season production; late fall, winter, and early spring.

Tomato production increased in 1972, 1973 and 1974 by more than 50%. Pimientos also increased substantially. The increase in off-season production was significant for all crops except potatoes. There was an over expansion of potato and tomato production in 1971 and 1972 resulting in losses. The processing capacity was not able to absorb the surplus.

III. Role of Government in The Development of Agriculture

A. Objectives, Priorities and Policies

1. Objectives, Priorities and Action Programs

Following the change in the Government's political orientation in the latter part of 1969 to coexistence of state, cooperative and private farms there has been an increased emphasis on helping private farmers.

The policy followed by the Government between 1971 and 1974 has been characterized by analysis of resource potential and readjustment of production alternatives. The experience of the decade of the 1960's and the evaluation by the GOT of agricultural development and resource potential have brought about a greater recognition of the potential as well as the problems of development.

The fundamental objective assigned to the agriculture sector in the Four-year Plan is acceleration of the growth of production. Greater production is considered essential in order to:

- 1) satisfy domestic demand which is increasing through population growth and improvement of incomes;
- 2) assure raw materials for the food processing industry; and
- 3) provide foreign exchange through exports.

The production objective is to be attained while at the same time making it possible for the majority of the rural population to participate in development, an objective that is considered as important as increased production.

Concerning employment creation, which is assigned the highest overall priority in the Plan, agriculture's contribution is expected to be a reduction in underemployment through an increase of 10-12 percent in the number of days of work while the number of people employed in the sector remains the same. In order to accomplish this, a high priority is to be given to livestock and forage production and to putting into production areas

already equipped for irrigation. These and other relatively labor-intensive sub-sectors will thus more than compensate for the reduction in labor inputs expected from further mechanization of cereals production.

With regard to investment, 60 percent is to be directed toward directly productive uses (as compared to only 24 percent during the previous Plan period). The total amount of investment for the sector is to be 70 percent greater than under the Third Plan. The public sector is to account for 56 percent of the total as compared to 84 percent previously.

An annual rate of growth of 7.4% was set for GDP in the Plan and agriculture was to achieve an annual growth rate of 6.2% compared to the average for the Third Plan.

Cereal production was expected to grow at an annual rate of 6.1%, as a result of the introduction of the new high yielding varieties of wheat. Production of livestock would accelerate (meat 7.8% increase per year, milk 11.5% and eggs 9.5%). This increase would result from imports of improved breeds, increased productivity from beef fattening and increased feed and fodder production. Vegetable production would increase at an annual rate of 9% through expansion of area under cultivation and increased productivity.

Forestry and soil conservation would be more closely integrated. Efforts would be made to expand irrigation use in the areas already equipped (in 1972, only 50% to 65% of the areas equipped were used).^{5/} Irrigation facilities would be expanded. Production of fisheries would be expanded from 35,000 MT in 1972 to 53,000 MT in 1976.

2. Evolution of Policy on Pricing - Subsidies

With the introduction of the high yielding wheat varieties, the policy was to increase the production of bread wheat because of the deficit of bread wheat in the country and because of the higher productivity of the new variety. Production increases would be achieved by expanding the area devoted to bread wheat and reducing areas devoted to durum and barley.

The change in areas devoted to the different cereals was sought through changes in their respective prices. Although there had been and still are minor price adjustments for cereals annually, there have been only two major changes in recent years.

One change was in 1967-68 when the prices were raised above that of major producing countries (U.S., Canada, and Australia) but below prices of the European market. The prices were set at 42.0 dinars per MT for hard wheat, 34.5 dinars per MT for soft wheat and 20.8 dinars per MT for barley and other cereals. The price increase narrowed the gap between soft and hard wheat.

A second major price increase in 1973 was to bring prices in line with the increased cost of production caused by inflation. The price of barley was increased more than the others relative to its previous price, although the absolute increase was the same. This measure was taken by the Government to increase barley production for livestock feed. Durum wheat was increased to 61 dinars per MT, bread wheat to 55 dinars per MT, and barley to 40 dinars per MT.

The effect of the price change has been to increase the area devoted to barley by about 38,000 hectares and to reduce the area in durum wheat by 163,000 hectares in 1974. Area in bread wheat expanded by only 11,000 hectares.

The grain storage study by Kansas State University in 1974,^{6/} pointed out the potential economic advantage afforded to Tunisia for again encouraging durum production for export. The price differential on the world market is considerable. Tunisian prices are about 50% of the prices in Europe. The price difference between durum and bread wheat on the European market is \$7.34 per quintal (\$73.40 per MT) and \$1.38 per quintal (\$13.80 per MT, respectively).

The Ministry of Agriculture is following the recommended policy. The Ministry's Plan for 1975 calls for an exportable surplus of durum in 1975.^{7/} The Ministry appears to be making an all-out effort to achieve maximum production of cereals for the 1974-75 crop.

On the question of storage, Kansas State recommended differential pricing of wheat by seasons to reflect storage costs and to provide an incentive to flour mills, farmers, and storage organizations to store cereals. This should relieve some of the storage problems in Tunis, where fourteen out of sixteen flour mills are located. It is doubtful that it would relieve storage problems greatly at the 130 distribution centers because of the farmer's need for cash and his lack of suitable storage space. They are also storing wheat when fertilizer is needed. Regional pricing of cereals was also recommended to reflect transport costs. Differential pricing for fertilizer has been considered by the Ministry as a means of stimulating early purchases by farmers to relieve storage problems but has not been adopted.

The Government has continued its policy of subsidizing agricultural production, industry and consumption. Fertilizer is subsidized now at about one-third the world price of nitrogenous fertilizers. This policy is necessary as long as cereal prices are controlled at current levels.

It is doubtful that Tunisia, a net importer of food, can continue its policy of subsidizing both production and consumption to the extent that it does. Although there are taxes on production, income is not enough to support all subsidization programs. In the face of increased costs of fuel and continued spiraling of inflation in all exporting countries, it would make good economic sense for the country to re-examine its subsidization programs.

Elimination of the subsidy on meats should be the first to be considered. Carrying out the recommendations made by Larsen would permit increases in prices of livestock and meat. This would stimulate feeding and production per animal. The effect would be a normalizing of prices of poultry meat versus other meats. with probably an increase in consumption of poultry and a decrease in consumption of other meats. This would be desirable from a resource use point of view.

B. Institutions, Administration and Planning

1. General Administration and Services

The Government has sought to improve services by increasing its staff of trained technicians, by developing semi-governmental agencies, offices and the so-called "professional groups", and by decentralization of planning and administration. It is seeking to reach greater numbers of the rural population through decentralized, integrated, rural development projects. Two or three such projects have been planned: one with the assistance of IBRD/FAO; one with the assistance of Canada; and one with USAID assistance. However, none of these projects has really gotten underway.

The Ministry of Agriculture has gone through a number of re-organizations. The last major one was in 1973. Regional offices, "Agricultural Commissariats", in the Office of each Governorate are the principal administrative units in the field. Their roles and staffs are being increased. There are 18 Governorates.

2. Semi-Public Offices

Emphasis has been placed on expansion of semi-government offices and increasing their functions as a means of providing technical and logistical assistance for increasing production. These organizations have been given a greater role in the promotion of agricultural development.

The office for development of the Medjerda Valley (OMVVM) has three principal missions: to maintain a network of water resources; to create irrigated perimeters; and to provide agricultural extension, credit support, and procurement of supplies and marketing of farm products.

The Office of Cereals purchases, imports, stores and distributes cereals. Other offices include the Office of Livestock and Pastures, and the Office of Oils (olive oil, principally, and other vegetable oils).

A number of new organizations have been created:

- The Office of Wine for grapes and wine;
- The Office for Development of the Nebana;
- The Office for the Development of Lakhmes, and
- The Office for development of poultry and small animals.

3. Professional Organizations and Cooperatives

Professional organizations have also been created to provide technical assistance to farmers, to provide farm supplies and market farm products.

In this category, the following organizations have been created:

- Association of citrus and fruit growers;
- Association of vegetable growers, and the
- Association of date growers.

These associations are staffed with technical personnel, and receive some support from the State. Their creation represents an effort to decentralize and specialize extension services, as well as to promote the development of supply and marketing channels for farmers.

Another type of farmers association being promoted is the association of collective interests. These are used primarily in the irrigated sector. There are 109 such collective associations and there are plans to organize 50 more.

There are seven central service cooperatives. They include two seed cooperatives, Cooperative for Seed and the Central Cooperative for Seed and Improved Plants, and the Field Crops Cooperative. These cooperatives purchase and distribute certified seed, process and store seed, and make contracts with seed farmers for production of certified seeds. They also handle and store cereal grains for the Office of Cereals. Some 521 local Service Cooperatives provide supply and marketing services directly to farmers.

4. Research

Four agricultural institutes, each with several outlying centers, are responsible for agricultural research. These are (1) The National Institute for Agronomic Research (INRAT), (2) The National Institute for Forestry, (3) The Center for Research in Rural Engineering, and (4) The National Institute of Science and Technology for Oceanography and Fisheries. All are responsible to the Ministry of Agriculture and supported by Ministry funds.

INRAT is headquartered in Tunis and has 23 experimental stations or farms scattered throughout the country. Experiments are carried out on agronomy, industrial crops, horticultural and animal science.

Recent successes of INRAT include the introduction and development of improved varieties of durum wheat, bread wheat and barley. These varieties, of high yield potential, along with better cultural practices, i.e. soil preparation, fertilization, weed and pest control, have led to substantial increases in cereal crop production. Similar work is in progress with oil seed crops, edible legumes, sugar beets and forage crops.

The number of Tunisians well qualified to do research is very limited. Only three or four have been trained to the Ph.D. level. Two of these, one in genetics, the other in plant pathology, were trained under the Cereals Project. Most of the Tunisians in research positions are "ingénieurs agricoles" (B.S. level) and lack the specializations and level of training for the quality of research needed in a national research institute.

Foreign experts working at the station feel that with the exception of genetics and plant pathology research would deteriorate on most other projects in the absence of foreign experts. However, a few Tunisians trained to the "ingénieurs agronomes" (M.S. level) are added each year.

The staff is spread extremely thin. Eight multi-disciplinary teams have been organized to work on research projects involving vegetables, cereals, livestock, fodder crops, citrus, olives and desert encroachment.

There are problems of research administration since a very small administrative staff must deal with 23 separate stations. Some of the stations are poorly equipped, lack staff and adequate buildings. Yet, we understand that more stations are to be created to represent specific micro-climates and ecologies at a greater number of locations in Tunisia.

The Four-Year Plan projects a need for 38 professional staff members and 60 technicians. The professional staff would be composed of researchers (M.S. or Ph.D.'s) and ingénieurs (B.S.). The technicians would be at the level of "ingénieurs adjoints". These technicians are graduates of an agricultural high school and have completed about two years of special training at an agricultural institute.

Among the personnel problems is the lower status in the civil service system of employees of the research institutes than personnel of similar training in other services. This makes a research career less attractive. Corrective measures will have to be taken to attract the qualified personnel required for research.

The need for the large number of research stations might be questioned. Although adaptive research is needed, it would seem that research needs of the main crops and their rotational patterns should be met before less important programs are undertaken.

One possible area of quick research pay-off is improvement of crop rotational systems to bring the 25% of the crop land which lies fallow each year into production.

Tunisia has made progress in co-ordinating use of research results with organizations serving farmers. A scientific co-ordinating committee has been established at the working level of research and extension. There are plans to establish a Superior Research Council at the Ministerial level for considering research needs and priorities.

The importance of research to the country and the constraints facing research warrant giving research priority in the allocation of resources. However, this must be done simultaneously with assistance to extension to find ways of more effectively reaching the small and medium farmers.

5. Extension

The infrastructure to provide extension services has been developed. All the conventional means for transfer of the information to the farm population are used more or less effectively to the extent of personnel coverage. However, the coverage is not yet adequate to reach the masses of medium and small farmers.

A Central Extension Division, headed by a Director, is located in Tunis. A number of extension agents are located in the various Gouvernorates. In addition there are eight semi-autonomous offices, described above, working in specialized areas of agricultural production, which have their own extension programs and staffs.

All of the extension groups rely, in general, upon INRAT for developing the basic data and formulation of specific extension recommendations. Several of them, however, have developed both basic and adaptive research programs in order to meet the urgent need for extension information on certain crops.

Some of the commodity extension programs are well planned and executed. The Office of Cereals, through the Technical Division Unit, conducts, each year, an effective extension program. This program includes well designed demonstration programs on wheat varieties, fertilizer application, weed control and crop rotation. The demonstrations are well publicized and, at appropriate times, are explained to large audiences of farmers. Livestock and other offices have similar programs and all are directed toward the goal of increasing agricultural production and improving farmers' incomes. Both of these activities have been developed with considerable technical assistance by USAID and other donors.

A considerable amount of progress in agriculture is attributable to the extension activities but the rate of progress needs to be increased. The chief factors which contribute to the less than desired rate of progress are as follows:

- (1) Insufficient staff at the engineer (B.S.) level;
- (2) Insufficient numbers and inadequate training at the adjoint technique level;
- (3) Lack of an extension subject matter specialist cadre at the national level;
- (4) Lack of logistic support for all the staff, i.e. vehicles, petrol, demonstration equipment and supplies;
- (5) Travel allowances not sufficient to cover actual expenses of staff when on official duty away from post;
- (6) Poor coordination between national, local and office staff;
- (7) Limited opportunity for advancement of personnel and little or no recognition for notable accomplishments;
- (8) Poor coordination of extension programs with availability of agricultural inputs.

The Ministry of Agriculture reported that there were 3,679 agricultural personnel working in agriculture in the Government as of September 1974 (see Table 11). While these personnel were classified as extension, most of them were in administrative positions.

6. Agricultural Education

The policy of the Government toward agricultural education is maximization of output, integration of programs, and increase in specializations. The policy is to adapt training to equip the trainee to create his own employment. This is a departure from the former policy to train specific numbers to fill specific identified needs.

The curriculum at INAT will be changed in 1975 to permit specializations during the last two years in various disciplines of agriculture, and agricultural economics. The goal is to double the capacity of INAT from its present level of 50 to 60 graduates per year to around 120 per year. Starting in 1975, classes will be expanded by using facilities at Chott Maria.

INAT provides a four-year course which is followed by a year of practical work for the degree "Ingénieur Agricole" (B.S. equivalent). In 1972, the "troisième cycle" was initiated for the post graduate degree of "Ingénieur Agronome" (equivalent to the M.S.). For this degree, two additional years of specialized study in Tunisia or abroad are required.

INAT has experienced difficulty in obtaining qualified candidates to enter graduate training. Candidates must pass a competitive examination. In 1972, the number who passed was 25 and 18 were selected. In 1973, the number who passed dropped to 18 and in 1974, the number was 8.

An "Institut Supérieur" for fisheries was established at INAT in 1973. An "Ecole Nationale de Médecine Vétérinaire" recently began accepting students. Three agricultural institutes provide two years of training in specialized fields of agriculture to candidates with high school degrees, or equivalent experience.

These institutes are:

- Institute of Rural Engineering and farm management at Medjez El Bab;
- Institute for Irrigated Crops at Chott Maria;
- Institute of Sylviculture and Range Management at Tabarka.

Tunisia has eight agricultural high schools, one of which is for girls. These schools have a total capacity of 1680 and can produce 500 graduates a year. The curriculum requires five years to complete.

There are now 17 two or three year vocational agricultural training centers; 15 are for boys and 2 are for girls. Collectively, these centers have facilities for 2,830 students.

The number of personnel trained in agriculture for the period 1971-74 at all levels as estimated by the Ministry of Agriculture is shown in Table 12.

It appears that within a few years, the country will meet its needs in middle and lower level personnel, but there will remain a shortage of personnel trained to the M.S. and Ph.D. levels.

7. Planning

Progress has been made in agricultural planning. The staff of the planning bureau in the Ministry of Agriculture now has 10 agricultural economists trained to the M.S. level at the University of Minnesota. They are actively participating in economic analysis and planning, working in harmony with their American counterparts provided by the University of Minnesota under an AID contract.

While the bureau has gone through several reorganizations, an adequate framework exists for effective work of the returned participants. The former BPDA has been divided into two bureaux: a Bureau for Planning, Economic and Project Analysis, and a Bureau for Agricultural Credit and Investment. The U.S. trained participants have been integrated into the Government's Civil Service at the "Ingénieur Principal" level, formerly open only to Tunisians with the French degree of "Doctorate d'Etat".

The project with Minnesota is now running smoothly, and it appears that the goal of 25 Tunisians trained to the M.S. level will be achieved by 1978.

A number of Economic analysis papers have been produced, and analytical and planning data prepared which are useful in planning.

The annual plan for 1975 has features which show progress. It includes an analysis of demand for fertilizer and seed for the next year, and a schedule for delivery by regions, crops, and months for 1975. If used by the procurement and distribution organizations, there should be an improvement in availability of fertilizer.

There appears to be a growing recognition by other agencies of the Government of the capability in the Planning Bureau of the Ministry of Agriculture.

While there appears to have been improvement in annual agricultural planning, no work has been done for improving the overall planning process in preparation of the next four year planning process. There may be an improved plan for the next exercise, but it will be the result of more trained people to do planning.

C. Investment

The Four-Year Plan 1973-1976 called for an investment of 177.7 million dinars in agriculture during the period. This would represent an increase of 79 million dinars over the previous four-year period of 1969-72. Total investment for all sectors in 1973-1976 would reach 1,194.2 million dinars. Thus, agriculture's share would be 14.9%.

The following data from the Ministry of Plan's Economic Budgets for 1974 and 1975 show investments (in millions of dinars) by year for agriculture and fisheries:

<u>1972</u>	<u>1973</u>		<u>1974</u>	
(Realized)	(Planned)	(Realized)	(Planned)	(Estimated)
24.9	32.5	30.5	44.4	42.2

Table 13 shows the breakdown in agricultural investment realized for 1972, 1973, and 1974.

IV. ECONOMIC FACTORS

A. Consumption

Demand and consumption have apparently increased only slightly for staple foods (primarily cereals), about in line with the estimated rate of population growth of 2.8% to 3.0% per year. On the other hand, judging from imports of animals, meat, and increased domestic production there has been a proportionately greater increase in consumption of live-stock and poultry meats, eggs and milk.

Human consumption of cereals in 1973-74 was 1,221,600 MT.^{2/} Animal consumption was 197,000 MT for that year. Imports of cereals totaled 364,600 MT for the year. The amount used for seed was 100,700 MT. This made the total consumption 1,519,300 MT.

Increased production and imports of meat, poultry products and milk appear to have risen faster than population growth although some of the increase may be explained by adjustments of statistics. The rate of increase would indicate a rate of increase in consumption above those of past years. Imports of cattle for meat increased from 2,384 MT in 1969 to 3,655 MT in 1973, an increase of 1,271 MT; sheep for meat increased from 1,472 MT to 2,893 MT; and concentrated milk increased from 2,798 in 1969 to 5,339 MT in 1973.

B. Land Tenure - Land Tenure Policy and Influences on Production and Income Distribution

1. Land Tenure System

The land tenure system which exists in Tunisia is a carry over from the French protectorate. State lands are those taken over by the Tunisian Government when the colon farms were nationalized. These lands are the most fertile in the country, and produce most of the products entering commercial channels. Most of the former colon land was initially held by the State and operated in state farms or by cooperatives. Some of the land has been transferred to private ownership.

The land tenure distribution as it existed in 1974 is shown in Table 14. There have been small changes in the composition of tenure since 1970. In 1970, the Government held about 830,000 hectares in state and cooperative farms (see USAID's Agricultural Sector Paper 1972). The Government plans to distribute some 300,000 hectares of public land to private ownership. The land scheduled for transfer is as follows:

Small scattered parcels	39,133 Hectares
Integrated public lands	74,855 Hectares
Public farms after division	129,439 Hectares
Regularizing tenure of land previously transferred	45,288 Hectares
Land developed in irrigated perimeters	<u>11,285 Hectares</u>
	300,000 Hectares

Regional commissions have been given responsibility for transfer of public lands. The transfer was started in 1971 in implementation of Public Law No. 25 of 1970, and 111,383 hectares and 159,000 olive trees had been transferred to 21,291 beneficiaries. The distribution was as follows:

5,581 to members of cooperatives and agricultural workers

2,601 to small farmers

108 tenure regularized for exceptional social situations

149 to agricultural technicians

300 to medium level farmers

12,552 tenure regularized according to previous tenure
(before nationalization).

There are plans to complete the transfer of the rest of the land by the end of the current Four-Year Plan (1973-76). The Government, by law, reserves the right to sequester transferred land which is being underutilized.

The referenced law affirmed the principle of freedom of choice by former land-owning members whose land was nationalized to operate their land, or to keep the land under the collective operation of new cooperatives.

Following the dissolution of the former state cooperatives, 241 new cooperatives have been formed on former public land covering 217,915 hectares. These cooperatives provide employment for 10,806 cooperative members (land holders), former workers of state lands, and new graduates of agricultural schools.

Overparceling of land has resulted from successive division of land among families and from the population pressure on non-state agricultural lands. The extent of this is shown in Table 14.

2. Influence of Land Tenure System on Production and Income Distribution

The influence of kind of tillage on yields of the various crops as reported in a recent study^{10/} are shown in Table 15. For example, yields of durum wheat in Region II (Beja, Djendouba, and Le Kef) were: lowest for "superficial" (hand and some animal) cultivation; next for animal traction; and highest for mechanical traction. The yield for bread wheat showed less variation in the two types of tillage.

Mixed technology farms are composed of small and medium farms which practice a mixture of traditional and modern technology in farming. The agricultural bank (BNT) classifies a medium-sized cereals farm as one of 50 to 100 hectares. A small cereals farm is under 50 hectares. These mixed technology farms use a mixture of animal power and tractors for plowing and combines for harvesting. These are either rented or obtained on a custom basis (contract). Harvest is done by hand, animal drawn mowers, and combines. Crops produced on these farms in 1971-72 included durum wheat, bread wheat, barley, and oats, and fodder. In Region I, fertilizer was used on durum wheat but none on bread wheat. In Region II, the mixed technology farms used no fertilizer at all. No wheat varieties of high yield potential were reported grown on these farms in either Region during 1971-72.

An important conclusion from these studies is the importance of the small and medium farms. Contrary to some belief, they do produce a significant amount of marketable surplus of cereals. The farms are well diversified and grow all types of cereals, except the new wheat varieties.

They have been brought into the modern sector in terms of machinery use, but not to a great degree in the use of fertilizers, and none in the use of new varieties. It appears that the rental of machinery is limited by:

- (1) the availability of machinery when needed (it is rented by state and modern private farms after they have completed their work;
- (2) the availability of cash to rent the equipment; and
- (3) the high cost of rental.

An interesting observation, and perhaps a significant one, is that fertilizer use by the mixed technology groups is confined to Region I, and is used only on hard wheat. Region I is the area located in the Tunis-Nabeul-Bizerte area, and farmers in these Governorates are near the agricultural information centers and sources of supply of Tunis, and are served by better transportation systems. If the nearness to Tunis is a factor which has influenced the use of fertilizer for this group, it bears out the constraint factor of a lack of availability of fertilizer

when needed in other areas. It may also be due to the more convenient transport systems in the area and the superior communication and information services.

Lastly, there is an important income distribution implication. Since these medium and small farms comprise 96% of the farm operators in Tunisia, the income distribution significance is apparent. Any improvements on yields and incomes among this group can make a significant contribution to objectives for income distribution.

The other implication is that this sector is the slowest to adopt improved technology. However, the fact that there have been some changes in technology on these farms provides leads to the constraints which may be holding this group back, and which suggest possibilities for further improvements.

C. Irrigated Development

1. The Needs for Water

The reason for the GOT's high priority on conservation and utilization of water and soil is the critical balance between the needs for these two resources and the limited supplies. Human consumption of water is increasing at a rapid rate; in some areas (Sahel), the rate of increase is 6% per year. However, not all the increases represent a total increase in national demand on the resources; but rather some of the increases represent a redistribution of demand.

Flood control is another factor which is receiving high priority. Some of the conservation and water development programs are multi-purpose. The reforestation checks erosion and diminishes flood damages, and the reservoirs serve to prevent, or diminish, impacts of floods.

The push for irrigation by the Government is to provide greater crop potential in the dry summers; replenish the water supply in the Cap Bon vegetable growing areas, and to expand potential in suitable frost-free areas in the Sahel and the South for production of winter vegetable and fruit crops.

2. The GOT Plans and Programs

a. Conservation and Utilization of Resources

(1) Reforestation and Forest Protection Programs

The conservation programs include: projects for reforestation of 15,000 hectares; measures to protect 9,000 hectares of forests; measures to control desert encroachment covering 2,400 hectares; and creating fire protection zones on 15,000 hectares. The investments for these projects were estimated at 4,000,000 dinars.

(2) Water and Soil Conservation Projects

The projects for water and soil conservation for 1973-76 include: the National Program, 7,580 hectares; Project PAM 425, 4,900 hectares; Project PAM 482, 2,086 hectares; and Project Marguellil, 4,500 hectares. The cost of these projects was estimated at 2,110,000 dinars. Accomplishments include the creation of three hill lakes, 10 diversion dams, and five flood control dykes.

(3) Protection of Cities Against Floods

Between 1971 and 1974 projects costing 800,000 dinars were implemented for protecting Gabes, Gafsa, Sidi Bou Zid, Zarzis, Sfax and Bou Arada.

(4) Projects to Repair Flood Damages of 1969

This program has reclaimed 970 wells and repaired 3,500 hectares of irrigated land which were damaged by the 1969 floods. In addition, 13,500 hectares of land have been reclaimed in the soil conservation program. The costs of these projects were on the order of 1,000,000 dinars.

(5) The Projects to Save the Citrus of Cap Bon and the Oases

A temporary measure will be initiated in 1975 until the Water Management Project of the North is implemented. Water will be diverted from city water supplies to save 5,600 hectares of citrus in the Cap Bon area. The cost was estimated at 2,200,000 dinars.

The Water Management Plan of the Center and South will save citrus and other plantations on the oases near Gafsa (1,250 hectares) and Kelibia (1,400 hectares), costing 400,000 dinars.

b. National and Regional Water Management Plans

National and regional water management plans are being developed for the North, Center and South. The objectives of the plans are to make in-depth studies of the water potential of the country, and ways for the economic utilization of water, keeping in mind the following priorities: water supplies for human consumption; satisfying the needs of irrigation; and meeting the needs of industry.

The studies for the water management plan for the North have been carried out. This plan will provide city water for Tunis, Hammamet and Bizerte to the year 2,000. Additional water will be allotted to irrigate 6,200 hectares in Cap Bon and 30,500 hectares in the Governorates

of Bizerte, Cap Bon, Beja, and Tunis South. The cost was estimated at 108 million dinars, of which 50 million dinars were programmed in the 1973-76 Plan. Work is scheduled to start in 1975 on the construction of a dam on the Medjerdah River at Sidi Salem and the construction of a 135 km canal between the barrage Aroussia on the Medjerdah to Cap Bon. This canal will provide water for the urban areas surrounding Tunis; irrigation; and will relieve the intensity of floods.

The water management plan for the Center is still under study. A principal purpose will be the protection of Kairouan and Sidi Bouzid against floods. Work is scheduled to start in 1975 by the construction of a dam at Sidi Saad and the development of 4,000 hectares for irrigation in the Governorate. The global cost was estimated at 30 million dinars.

Studies for the water management plan for the extreme North and the South have begun. So far, seven wells have been dug in the extreme North (Nefza) and 78 wells in the South. Also, work is continuing by OMVVM on the implementation of the Bou Heurtma project and the Ghardimaou project in the Medjerdah Valley. During the period 1972-74, 3,000 hectares of new irrigated perimeters were completed, using reservoir water, and 2,000 hectares using well water.

The Ministry of Agriculture approved credit in the amount of 3,156,000 dinars during the 1972-74 period to the private sector for digging 6,000 wells, for irrigating 10,000 hectares of land, and for digging 375 exploratory wells.

c. Developing Pasture Resources

Plans call for developing 250,000 hectares of pastures in the Center and South. The largest single project covers 200,000 hectares which are to be included in an integrated rural development activity including a beef fattening program and the development of 6,000 hectares of permanent pastures.

3. Comments

The Government's high priority on the development of water resources is motivated primarily by increased demand for potable water and the need to expand irrigation development for production of summer crops and off-season crops in the warmer areas of Tunisia.

The development of irrigation reservoirs and primary canals has proceeded faster than the development of on-farm delivery systems, the training of farmers, and the development of marketing infrastructure to serve farmers. However, there appears to have been some improvement in this area.

D. Agricultural Credit

1. Programs and Institutions

The Government's stated policy is to provide adequate credit to all farmers, particularly to the medium and small farm operators. A considerable effort has been made in recent years to broaden credit programs as indicated by an increase in the number of short and medium term loans.

The Government has expanded the activities of a number of institutions, and created new ones in its effort to reach greater numbers of farmers and fishermen.

The Government issued a decree in 1972 directing that Regional Land Commissions (concerned with tenure problems) grant a "temporary Certificate of Possession" to land owners who lacked title but owned land. This decree was passed to overcome the problem which farm owners, particularly owners of medium and small farms, faced in getting credit. The certificates were to serve as an attestation of title. However, the BNT, the principal lender, was reluctant to honor these certificates. In 1974, a law was passed making the certificate legal to serve as a proof of title.

The institutions involved in credit are discussed below according to the type of credit operation.

a. Short-Term Credit

The principal institutions involved in short-term credit are the agricultural bank, or Banque Nationale de Tunisie (BNT) and local credit unions, or Caisses Locales de Credit Mutuel (C.L.C.M.).

Other institutions involved in short-term credit include the several commodity Offices and the agricultural development agencies.

In December 1973, the Government passed legislation authorizing the creation of Societes de Caution Mutuelle, or mutual guarantee credit societies.

Also in 1973, a supervised credit program was launched aimed at decentralizing loan approvals and granting of short-term credit.

The amounts and numbers of short-term loans granted by all organizations for the years 1971, 1972, and 1973 are shown in Table 16.

BNT's share of the totals shown in Table 16 ranged between a high of 1,153 in 1972 to a low of 1,110 in 1973. The amounts were 2.3 million dinars in 1972, decreasing to 2.1 million dinars in 1973. ¹¹

The Caisse Locales granted loans to 8,000 borrowers in 1972 and 5,500 in 1974. The amounts of loans were 1.3 million dinars in 1972 and about the same amounts in 1973 and 1974.

Loans made by the various Offices were made in-kind: fertilizers, seeds, insecticides, and herbicides.

OMVVM reported that 16,136 loans-in-kind had been made to farmers during the period 1972 to 1974.^{12/} The total amount of loans was 767,000 dinars. For the season 1974-75, loans-in-kind amounting to 5,316 will be made to farmers, and the total amount will be about 294,000 loans. OMVVM also reported that the rate of reimbursement had increased from 39% in previous years to 58% in the period in 1973-74.

Short-term lending during 1971-1974 has been much greater than in the period 1962-1971. Most of the increase has been due to programs of the various offices extending loans-in-kind.

b. Medium and Long-Term Loans

A number of agricultural development funds have been created by the Government and foreign donors for financing medium and long-term credit. The largest source is from the Government of Tunisia. Following are the funds:

- F.S.A. Fonds Special Agricole, financed by USAID Local Currency Loan funds;
- F.O.S.E.P. Fonds Special d'Encouragement de La Peche (fisheries development funds);
- F.O.S.D.A. Fond Special de Developpement de L'Agriculture (Agricultural Development fund);
- F.A.I. Fonds Allemand Pour L'Irrigation;
- O.E.P. Office de L'Elevage et de Paturages (for development of livestock and pastures);
- O.M.H. Office de l'Huile (for development of olive oil plantations);

The World Bank (IBRD) also made a loan which is handled by BNT.

All development funds are handled through the BNT, but the approving authority rests with The Ministry of Agriculture and its agencies.

The FOSDA and FOSEP funds are the most important in terms of amounts and numbers of loans granted.

The volume and numbers of medium and long-term loans made annually also increased during the period 1971-74 (see Table 17), as compared to the annual performance in period 1967-1971.

2. Constraints

Despite the substantial annual increases in numbers and amounts of loans in 1971-1974, the programs are touching only a small part of the estimated 325,000 farm families.

There has been only limited improvement in developing credit institutions. The constraints which existed in this area in 1971 and 1972 remain.

Principal constraints concern:

- the lack of viability of institutional programs in agricultural credit, because of the high cost of lending, and low interest rates;
- the low rate of reimbursement;
- the centralized system of approving credit (although there has been some decentralization, it is not enough);
- the shortage of qualified technical staff and appropriate organizations to study applications and advise farmers on farm budgets;
- inadequate availability of inputs when needed; and
- inadequate agricultural extension organization.

E. Consumption of Agriculture Supplies and Distribution and Marketing System

1. Fertilizer

Phosphate fertilizers are produced in Tunisia from locally mined rock. Export of these products is an important source of foreign exchange to the country. Their importance has increased with the increase in world prices during the past year. There are five companies producing respectively: 16% and 45% P_2O_5 superphosphate; 45% P_2O_5 triple superphosphate; 28% P_2O_5 hyperphosphate, and 54% phosphoric acid. The production capacities of the three superphosphate plants are: 260,000 MT of 45% and 60,000 MT of the 16% P_2O_5 superphosphate; and 30,000 MT of the 45% P_2O_5 triple superphosphate.

Locally produced 16% and 45% P_2O_5 superphosphate is used in agriculture in Tunisia. Also minor quantities of phosphate rock are used.

All ammonium fertilizer (nitrogen) is imported.

An ammonium nitrate capacity which is planned would benefit Tunisia greatly. There is a world shortage of this product which is expected to continue to around 1978 or 1979. The price of ammonium nitrate, the principal nitrogenous fertilizer used in Tunisia, has risen during the past two years from around \$80 per MT to about \$300 per MT. It is understood that the principal reason holding up construction is the availability of natural gas for nitrogen fixation.

The price of nitrogen fertilizer to farmers is subsidized. Farmers pay about 50 dinars per MT.¹³⁷ or about one-third actual cost. The price to farmers before the big increase in world prices was about 28.5 dinars per MT. Phosphate fertilizer has not been subsidized in the past; however, the domestic price is fixed and the world price has increased beyond that level, which results in indirect subsidization.

The TVA study found a fragmentation of marketing of fertilizer in Tunisia and a number of other constraints which prevented demand from being fully met. Imports were handled by three companies with one (STEC) responsible for distribution.

Imports are often delayed by delays in payments of the subsidies by the GOT. Deliveries of most of the fertilizer is made in the fall which is the major consumption period. There is a shortage of storage space and transport facilities during that period. The TVA study indicated that better utilization of facilities could be achieved by advance planning and coordination to permit early deliveries. The Kansas State study estimated a need for 70,000 MT of additional storage capacity for grain and fertilizers and the addition of railroad cars to adequately transport these materials.

TVA estimated that by 1980 the effective demand for fertilizer would about triple: 75,800 MT of N; 47,000 MT of P₂O₅; and 6,000 MT of K₂O. The use of fertilizer in Tunisia increased annually during 1971 to 1974 as shown in Table 18.

The Ministry of Agriculture reported that the distribution under the credit-in-kind program for 1973-74, was approximately 182,000 MT of 33% ammonium nitrate, 80,000 MT of 45% superphosphate, and 63,000 MT of superphosphate 16%.

In 1969, the consumption of 33% nitrogenous fertilizer was about 25,000 MT and total consumption of the two phosphates was about 47,000 MT.

2. Other Chemicals

Other principal agricultural chemicals used are reported in terms of area of crop covered. The Ministry of Agriculture reported the following areas covered for weed control, mainly wild oats, in 1971-1974:

	<u>1971-72</u>	<u>1972-73</u>	<u>1973-74</u>
Area (ha.) covered with herbicides (weed control)	106,000	70,000	115,000

3. Certified Seed

The use of improved cereal varieties has increased since the release of Mexican wheat in 1968, although the problems created by poor quality of seeds in 1971-72 set the entire program back. Other new high-yielding varieties of bread wheat were released in 1973-74.

A constraint in seed availability has been caused by the lack of coordination between marketing organizations and producers.

4. Distribution and Marketing Systems

a. Controls

Prices of all agricultural products, except fruits and vegetables, are controlled. Marketing and distribution of all controlled products move through the semi-government offices, cooperatives, and grower's associations. Agricultural supplies move through the same channels. There is, however, a parallel channel of distribution of agricultural supplies through private trade channels. These handle a smaller percentage than the government agencies, largely because they do not participate in the credit-in-kind program.

b. Fruits and Vegetables

Fruits and vegetables are not controlled. These products move through private trade channels to domestic markets. Export marketing of fruits and vegetables move through grower's associations (GIAF), the Agro-combinats, and cooperatives, depending on the product and location of production. Export marketing organizations are equipped with packing and grading facilities, collection centers, and storage.

There are deficiencies in the system for marketing fruits and vegetables for export. While the Agro-combinats have integrated production with processing, this has been more difficult with the multitude of scattered small producers because of the difficulty in assuring a steady supply of high quality produce.

Domestic demand for fruits and vegetables products is somewhat limited. An unusual increase in production can flood the market, depressing prices, and causing losses in income to farmers. This has happened with potatoes and tomatoes.

OMVVM and other irrigation offices have organized marketing divisions to advise and assist farmers in marketing of those products grown in the irrigated perimeters.

5. The Cereals Sector

a. Prices-Subsidies

The price of cereals is controlled. The price at present is 61 dinars per MT for durum wheat, 55 dinars per MT for bread wheat, and 40 dinars per MT for barley. These prices are a little less than 50% of European prices. However, the margin between durum and bread wheat prices in the European market is about \$73 per MT against the 6 dinars per MT (\$14) in Tunisia.

Unlike the fruit and vegetable producers in Tunisia, the cereal farmers are assured a fixed price. While it is contended that the price does not provide the farmers an adequate incentive, production records and studies do not bear this out.^{14/} If all price controls and subsidies were removed on cereals, private Tunisian farmers could not afford to use fertilizer. Their productivity has not advanced to a stage, yet, where it is competitive with developed countries. Therefore, some protection is necessary.

There has been argument against the 7% production tax on cereals and on the 17% production tax on phosphate fertilizer. However, this is the most effective means of tax collection. Tax administration has not developed adequately for effective collection of income taxes, especially in the farm sector. The phosphate tax is more than returned in subsidies between the export and domestic prices of phosphate fertilizer. Also, the only tax on cereals is that levied on the estimated 25% of production entering official market channels.

A consumer's subsidy is paid on the retail price of cereals by the Office of Cereals. The subsidy amounts to about TD 15.19 per MT for durum wheat, TD 14.04 per MT for bread wheat and TD 22.95 per MT for barley (in 1974). These amounts and the price to millers are standard throughout Tunisia, with no allowance for storage cost.

b. Marketing and Delivery System for the Cereals Sub-Sector

The Office of Cereals purchases all cereals entering official channels; imports and exports all cereals and cereal products; and sells directly and through the service and grain cooperative to consumers, dealers, and millers.

The Office uses 130 centers for collecting cereals and for distributing farm supplies. The Bureau of Plan reported the following sales outlets for cereals:

Office of Cereals	86
CCGC	11
COCEBLE	12
Merchants	136
Cooperatives	37
Total	282

6. Other Controlled Products

The Office of Oils handles the purchases of olive oil and table olives from producers and processors; imports vegetable oils; exports olive oil through an exporting agency; and distributes imported vegetable oils to retail outlets. Collection of olives from producers is done at controlled prices. Some producers are also processors, such as some Agro-combinats, cooperatives and a few large private farms. All these handle olives for medium and small producers.

There is a Government agency which purchases and slaughters animals at official abattoirs and resells meat carcasses to butchers. The Office d'Elevage handles the distribution of feeds and animal supplies provided by credit-in-kind programs. Milk prices are controlled and the distribution of milk and milk products are handled by a semi-Government agency (STIL).

The prices of wine and table grapes are controlled through the Office du Vin. Cooperatives, state farms, and some private processors collect grapes from smaller farms at official prices and process them into wine.

Poultry products are not controlled, and the products enter private trade channels. However, there is a newly organized Office of Poultry and Small Animals which serves this sub-sector.

There are private distributors and dealers which handle some farm supplies, but the amounts are less than those which flow into Government agencies and service cooperatives.

F. Processing Industries

Agricultural and food processing industries are by far the most important component of the manufacturing sector. Such industries contributed 33-40% of the value added by the manufacturing sector and account for about 3.5-4.0% of gross domestic product. The variation from year to year is essentially a function of growing conditions, since, except for the milling and sugar industries, output is directly related to the availability of domestically produced inputs.

In terms of the value of production, milling and baking traditionally have been the most important component of the food industry, accounting for about one-fourth to one-third of the total in recent years.

In most years, meat slaughtering and packing has been the second most important element in the food industry in terms of the value of output. In 1972 and 1974, the olive oil industry, which normally occupied third place, jumped to first. Sugar refining and the canning industry dispute fourth place, but the pattern of steady growth of the latter would seem to assure its future predominance.

Food industry is not a major source of employment. In 1971, it employed only about 9,000 permanent workers. An additional 9,000 were employed on a seasonal basis, which when converted to a full-time equivalent amounted to 3,800 man-years.

As with most industries, the food sector is highly concentrated in the Tunis area, which accounted for 65% of permanent employment in the sector. Seasonal employment, at least in the canning industry, is more dispersed, with half of the canning plants found outside the governorat of Tunis, mainly around Nabeul and Sousse. Only bakeries and, to a lesser extent, bottling works, are found throughout the country. In addition to Tunis, Sfax and Sousse each have a number of plants for milling or for making couscous and pasta. However, in order to decentralize the milling industry, the GOT decided in 1972 not to authorize more mills in Tunis and has approved the installation of 5 new ones in other regions.

V. FAVORABLE FACTORS AND CONSTRAINTS

A. Factors Contributing to the Improved Production in the Agriculture Sector

The most important factor in the increased performance of the agriculture sector has been the change in Government Policy which took place in 1969, following the decision against nationalization. The new policy which has placed equal emphasis on the three sectors, state, private and co-operative, has been a stimulating and motivating factor for the entire economy. Tunisians report that private farmers now have confidence to make investments and increase production. Production results bear this out.

Many other factors also have contributed to improved production in the agriculture sector.

At the top of the list for cereals has been the contribution made by agricultural research. The development of new varieties and the increased consumption of fertilizer have resulted in increased production and yields of cereal crops.

Another important factor has been the increase in numbers and qualification of Tunisians occupying administrative, managerial, and technical positions in the Government services and semi-public agencies, and filling entrepreneurial roles in the private sector. Tunisians in responsible positions report a favorable change in attitude and morale among Government employees concerned with agriculture.

Technical assistance has and continues to be an important factor in the progress made as, for example, in cereals production. The "Accelerated Cereals Production Project", operated under the semi-government Office of Cereals and supported jointly by the Ford Foundation, CIMMYT, and USAID has provided useful experiences for the GOT in research, extension, and project management and supervision.

Other institutions and organizations have also made important contributions to programs in agricultural production.

The state and cooperative farms staffed by well-trained young Tunisians have contributed to the use and diffusion of improved technology, including the use of new varieties and fertilizers, insecticides, herbicides, and improved cultural practices. These farms comprise an important part of the highly productive land in Tunisia.

The state farms such as the "Agro-Combinats" have provided extension services for demonstration and training of private farmers in

the area. Also, they have provided some rental equipment and helped distribute supplies to small private farmers in the areas. The degree of advancement of agriculture on these demonstration farms and the potential of agriculture in the area is illustrated by the yields shown in Table 19.

The services of other government and semi-public organizations in helping private farmers have been important. These organizations, such as OMVVM, the Office of Cereals, and Office of Oils, and other offices have distributed seeds and fertilizer and provided some credit for their purchase. Also the Office of Cereals has provided a market outlet for cereals. OMVVM has also financed settlement programs on land being released by the state, and provided extension services and credit.

Increased mechanization has also been a factor contributing to increased agricultural production, particularly in the cereals sector. Tunisia had imported 7,075 tractors between 1963 and 1970, and about 8,091 tractors were in service in 1970. In 1973, there were 10,137 tractors in use. A recent study showed a direct correlation between production and yields relating to the use of mechanical versus animal traction on different types of cereal farms. Deeper plowing could be obtained with mechanical traction which it is postulated resulted in greater yields.

Another contributing factor has been Government subsidies. The Government has subsidized investments in tree crops, land improvement and mechanization. The Government has and continues to subsidize fertilizer prices, and the consumers' price of wheat products.

Credit, to the extent of its availability, has been important to agricultural growth. The availability of bank credit is still limited. The increase in credit allocation has been credit-in-kind by the Office of Cereals, other commodity offices, the Livestock Office and OMVVM.

1. Livestock Production

The factors favorable to all agricultural production also apply to livestock production. However, there are factors unique to the livestock sub-sector. Among the first category has been increased demand. The increased demand for meat indicated a rise in income among the salaried workers who can afford meat, although tourism and subsidized institutional consumption may have also contributed to the increased demand. Meat is highly income and price elastic on the demand side. There have not been significant increases in prices of meat between 1971 and 1974.

The reorganization of the Office de l'Élevage and the increase in levels and training of personnel under technical assistance programs have increased the effectiveness of the organization in

extension work. The USAID livestock project has been an important factor in improving the extension of demonstration competence of this agency.

Factors favorable to increased poultry production have been increased demand, uncontrolled prices, the Government subsidization of 30% of the feed concentrate, and availability of FOSDA credit beginning in 1973.

2. Olive Production

Like other crops, Tunisia's olive industry has benefited by four successive years of adequate rainfall. Other contributing factors have been:

- rejuvenation of orchards and new plantings of olive orchards which apparently has staggered production sufficiently to reduce the levels of cyclical fluctuations characteristic of olive trees of the same age. A substantial increase in world prices of olive oil also has benefited the industry.

- improvement in prices to producers has been an incentive for farmers to improve orchards.

Other favorable factors have been similar to those described already in other sectors.

3. Favorable Factors for Fruits and Vegetables

Most of the vegetable production in Tunisia is in the irrigated perimeters under OMVVM. This agency has expanded and improved its extension services and credit (in kind) to small farmers. The result has been an improvement in farming techniques, evidenced by the increased consumption of fertilizer.

B. Constraining Factors

1. Crop Production

Agricultural experts in USAID estimate that cereal production could be increased by 50% if a number of constraints were removed.

An obvious possibility is the expansion of area planted in the new cereal varieties. Considering that 20 quintals per hectare is not uncommon yield for the new varieties, with increased use of fertilizers and other improved practices raising yields to 15 quintals per hectare does not seem unreasonable. With only 155,000 hectares planted in new varieties and 897,000 hectares of productive cereals land still using traditional varieties, the potential for increased yields looks even greater than 50%. Of course, there are other limiting factors than use of improved seeds.

Improvement of cultural practices could make major contributions to yields, such as better control of weeds and wild oats.

Herbicides were used on only 115,000 hectares in 1974.

The lack of advancement in some of the sub-sectors of agriculture still relates to research and extension problems, but also to a number of social and economic factors, such as: availability of fertilizer, farm machinery, and credit, cost of inputs, the land tenure problem, and the lack of improved technology suitable for the medium and small farms.

U.S. agricultural experts believe that the 3 year crop rotational system with one year of fallow practiced in Tunisia is wasteful of resources and does not, for the most part, achieve its objective. This fallow could be replaced with edible or feed grain legumes, or forages provided adequate amounts of fertilizers are used in the rotation.

Another constraining factor is the limitation of the extension service. It is still deficient in numbers, and training of personnel and facilities to do the job.

Agricultural credit, while having made some advances, is only available to a small percentage of the total number of farmers. Credit is still not available to between 200,000 and 250,000 farmers. However, availability of credit must be tied to the availability of inputs.

2. Livestock Production

The livestock study identified a number of constraints. A major one was the over-population of sheep resulting in overgrazing and soil erosion. The solution proposed, was a reduction of 20% in the sheep population and improvement of pastures.

To increase meat and milk supply the study recommended programs to increase feed grains, forage production, improving pastures by seeding and management, and promotion of feeding of animals.

As in crop production, a major constraint to feed grain and forage production is the fallow system. This affects the supply of both food for human consumption and feed for livestock. In the rotation of dry-land field crops, one-third of the land is always idle in the three-year rotational system.

The livestock study suggested the possibility of using land, where the productivity is low because of high salt content in the water and soils, for production of forage crops and pasture grasses which are more tolerant to these soils. These would have to be tested. It also called attention to a potential of 60,000 hectares of unimproved land in the Sedjenane-Tabarka area where rainfall is high for production of forage and for improved pastures.

Price control at the level of sale of slaughtered animals to butchers is a constraint to the industry. Also regulation of prices of live animals by imports and sales by the Government agency, El Louhoum, works adversely to the producers. Freeing the market system of these controls is needed to permit a rise in prices of live animals necessary

for encouraging feeding programs. Increased feeding would strengthen demand for feed grains.

Shortage of milling capacity limits the production of feed concentrate. About 80% of the production of the one feed mill in Tunisia goes to the poultry industry.

The livestock study recommended that the lower cost of poultry production as compared to livestock warranted removal of the 30% subsidy. This recommendation was part of the general recommendation to put the production and marketing of all animal products on a free competitive system.

The lack of availability of certified seed and fertilizer is a constraint to producers of forage crops legumes. There is capacity for expanding the production of certified seed for sale to farmers. The constraint appears to be inadequate marketing systems to predict demand as well as availability of basic seed stocks for seed producers.

On Government policy, the export of 43,000 MT's of bran, 4,000 MT's of oats, 2,000 tons of broad beans, and 4,000 tons of molasses in 1973 raises the question of alternative economic uses of these commodities. These commodities could have provided concentrate to feed around 40,000 head of cattle.

3. Olive Production

Olive production in Tunisia, like other crops, is still heavily dependent on an adequate rainfall and its distribution. There are other factors.

While there is an FAO-SIDA program for improving the processing industry, improvements have not been fully realized yet and many of the olive presses are still old, resulting in losses of oil in the pulp.

Tunisian olive oil production is still not surplus to local oil demand. In order to export olive oil, Tunisia must import other vegetable oils to satisfy domestic demand. The only reason for exporting is to take advantage of a favorable price margin between olive oil and other vegetable oil on the world markets.

The demand and supply relationships of other vegetable oils have provided a price margin favorable for encouraging export of olive oil. However, the world demand for other vegetable oils has been growing faster than supply, and the margin could narrow to the point that exporting olive oil would not be profitable.

Olive oil yields in Tunisia are still below those of Spain. New technology is yet to be fully exploited. The two olive varieties introduced by the French are still in use, and no new ones have been added. It will take several years for the grafting and fertilization work under FAO-SIDA to be proven. Several more years will be required for improvements to be adapted on a wide scale.

The high world price of ammonium nitrate fertilizer (over \$300 per MT now as compared to \$80 MT two years ago) would require yields on the order of four times the present level to make the use of fertilizer attractive without subsidies.

A big problem facing olive production every year is the migrating starlings which sometimes hit Tunisia on their winter flights just at olive harvest. The birds come in the millions and cause heavy damage to the olive crop. No fully effective solution has been found to this problem.

4. Fruit and Vegetable Production

There is a limited domestic market for fruits and vegetables. For on-season production, the demand is easily met. In fact, there is sometimes a surplus of on-season production which results in losses. This occurred with potatoes in 1971-72 and tomatoes in 1973-74. The processing facilities which have been developed to meet local and European demand for processed products have limited capacities.

The required marketing infrastructure for both fruits and vegetables, while developed on some of the state agro-combinats and some of the co-operatives and associations, is still inadequate to serve large numbers of private farmers. The quality of processing of fruits by the associations is not meeting European standards completely, resulting in losses. Private facilities have not been developed to meet the high quality standards for export of fresh vegetable and fruit products demanded on the European market during its off-season. Only state farms have developed adequate techniques of production to assure a steady supply of quality vegetables demanded by importers for the European markets.

In the case of potatoes, consumption in Tunisia has been increasing slightly. Although production keeps up with demand during the normal production season, Tunisia still must import potatoes in off-seasons. The reason is that storage facilities have not been developed to carry potatoes over from one season to the other, and off-season production is inadequate to meet local demand. The GOT is currently working on an extension program to teach farmers how to build storage facilities to handle potatoes.

Production of citrus has been fairly well developed in Tunisia but in some areas production is limited by insufficient irrigation water.

VI. ROLE OF FOREIGN ASSISTANCE

In 1974, Tunisia was receiving assistance in the field of agriculture from more than a dozen countries plus the UN family of organizations and private groups. Nearly 50 separate projects were involved, although the term "project" is used here in a broad sense to include discrete activities ranging from a single short-term scholarship to multi-annual programs

involving a combination of numerous technicians, scholarships, and commodities. Nearly one-fourth of all technical assistance projects in Tunisia were in the field of agriculture, making this the most favored sector. The approximately 250 experts working in this field represented a much smaller proportion of the total in all fields, however, because of the large number of teachers and doctors working as "cooperants".

Because of the highly specialized nature of some projects and the multi-purpose nature of others, categorization is difficult. In general, however, one can say that livestock production was the area receiving assistance from by far the largest number of sources. Germany, Austria, Holland, Canada, Belgium, Sweden (through the FAO) and the U.S., all had at least one project in this area and some countries had more than one. The nature of the assistance included provision of breeding animals (Germany, Austria), some 20 experts (mainly from Germany, Belgium and the U.S.), study abroad (U.S.) and small amounts of equipment. Research in one fashion or another was being addressed by at least five different projects: - the UNDP/FAO in forestry; UNDP/FAO/UNESCO in arid zone agricultural development; Germany and France in a variety of fields at both INRAT and at experiment stations; Belgium in horticulture. Work in extension (in addition to that carried out in connection with other specialized projects) was being done by Germany, Belgium, Canada, and the Peace Corps. "Integrated" agricultural development projects of one kind or another were being tried by Holland, Sweden, and Canada, in addition to the U.S.

Assistance in other fields included irrigation (FAO/Sweden, Canada); education (France); seed production (Germany); plant disease (Germany); horticulture (Belgium, Bulgaria); machinery maintenance (Canada); poultry (Canada, Ecumenical Council of Churches); cereals (AID, Ford Foundation/CIMMYT); credit (Italy); olives (Sweden/FAO); farm management (Ecumenical Council of Churches); agricultural economics and planning (AID).

Although cost data is not available for most countries, it is apparent that the most important donors are Germany, Canada, Belgium and the U.S. (not necessarily in that order).

Footnotes

1. Data supplied by the Ministry of Plan in 1971 (Government of Tunisia). Revised series prepared later by the Ministry of Plan for the period 1962-1971 show a positive growth of about 2%.
2. 1974 Tunisia Acreage and Livestock Enumerative Survey, Vol. 1, U.S. Department of Agriculture, Washington, D.C. 1974, USAID
3. An Assessment of the Livestock Sub-Sector in Tunisia, by John T. Larsen, Agricultural Economist, U.S. Department of Agriculture, Washington D.C. 1974, for USAID.
4. Budget Economique 1974, Ministry of Plan, Government of Tunisia.
5. Le Secteur Irrigué en Tunisie, Etat Actuel et Potentialites, by Thomas E. Daves, Rapport de Recherche en Economie, Agricole MO. 13, BEDA, Ministère de l'Agriculture, Juillet 1972.
6. Study of Grain Storage and Marketing in Tunisia, Kansas State University, USAID, 1974.
7. Note de Synthese Relative au Budget Economique 1975, Direction du Plan, Ministère de l'Agriculture.
8. This information was obtained from the Director of the Direction de Recherche, de l'Enseignement, et des Formations des Cadres Agricoles, Ministère de l'Agriculture, GOT, 1974.
9. Op. Cit. Kansas State Study.
10. "Draft Research Report on Analysis of Farm Budgets on Three Types of Farms in Tunisia" by Dr. Terry Roe, University of Minnesota Team for the Direction du Plan et des Analyses Economiques et des Projets, Ministère de l'Agriculture, GOT, 1974.
11. Le Credit Agricole en Tunisie, by Thomas Stickley and Hedi El Hamari, for BEDA Ministère de l'Agriculture, 1974.
12. Rapport sur l'Operation Credit Supervisé - Campagne d'Hiver - 1974-1975, CAVVA, GOT, 1974.
13. Marketing and Distribution of Fertilizer in Tunisia, TVA, 1974, (For USAID).
14. Op. Cit., Roe

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TABLE 1

Agriculture ^{1/} Share in Tunisia
Gross Domestic Product ^{2/}

1962	23.3%
1963	24.1%
1964	23.7%
1965	23.2%
1966	17.3%
1967	14.7%
1968 ^{3/}	18.5%
1969	16.2%
1970	16.1%
1971	18.3%
1972	20.6%
1973	18.1%
1974	18.2%

Sources: Retrospectives Decennales 1962-1971 (Min. of Plan) for 1962-67; IV^e Plan 1973-76 for 1968-70; Rapport sur le budget économique 1974 for 1971; Rapport sur le budget économique 1975 for 1972-74.

1/ Including fishing.

2/ At factor cost.

3/ The National Accounts series is being revised so that it is discontinuous for the years before 1968. It is believed, however, that the relative sector shares will not change by more than 1 percentage point.

TABLE 2

TUNISIAN AGRICULTURE - RELATED EXPORTS 1962-1974
(Millions of Dinars)

	1962	1965	1968	1969	1970	1971	1972	1973	1974
Citrus	1.8	2.6	1.6	3.6	2.0	2.1	2.0	1.6	1.8
Dates	0.5	0.3	0.6	1.0	1.4	2.2	2.6	2.4	2.5
Almonds	0.6	1.1	1.7	0.7	1.5	1.4	1.3	3.9	2.2
Fish and Crust.	0.3	0.6	0.6	0.7	1.0	1.1	1.6	2.2	1.8
Legumes	0.5	0.5	0.8	0.9	0.9	1.0	1.1	1.2	1.2
Live Animals	0.4	1.2	1.4	0.9	1.9	0.5	0.5	0.6	0.7
Cereals	1.4	0.3	0.1	0.1	0.6	0.8	0.5	0.9	-
Others	1.2	1.7	1.6	1.6	1.9	1.8	2.2	1.6	1.8
Total Unprocessed	6.7	8.3	8.4	9.5	11.2	10.9	11.8	14.4	12.0
Olive Oil	12.9	13.5	12.0	10.5	8.7	24.6	47.1	26.2	58.5
Canned Vegetables	0.6	1.6	1.8	1.2	1.5	1.5	1.9	2.8	2.7
Canned Fruits	2.3	0.8	0.6	0.8	0.8	1.0	0.8	1.0	1.0
Wine and Liq.	7.7	2.8	3.6	3.5	4.8	1.3	3.1	9.4	5.0
Bran	1.1	1.2	1.3	1.3	1.7	1.6	1.4	1.2	1.6
Other	1.7	1.6	1.6	2.8	1.3	1.0	1.4	1.8	1.8
Total Processed	26.3	21.5	20.9	20.1	18.8	31.0	55.7	42.4	70.6
Total Agric.	33.0	29.8	29.3	29.6	30.1	41.9	67.5	56.8	82.6
(Less Olive Oil)	(20.1)	(16.3)	(17.3)	(19.1)	(21.4)	(17.3)	(20.4)	(30.6)	(24.1)
Olive Oil as % of agriculture export	39.1	45.3	41.0	35.5	28.9	58.7	69.8	46.1	70.8
Total Goods ^{1/}	48.7	62.9	82.8	87.0	95.8	113.3	152.2	168.6	335.0
Agric. as % of Total Goods	67.8	47.4	35.4	34.0	31.4	37.0	44.3	33.7	24.7
(Less Olive Oil)	(41.3)	(25.9)	(20.9)	(22.0)	(22.3)	(15.3)	(13.4)	(18.1)	(7.2)

^{1/} Excluding re-export of goods after transformation, except for 1974.

Source: 1962-71, "Statistiques des operations avec l'exterieur au cours de la decennie 1962-1971"
Ministry of Plan
1972-74, "Rapport sur le budget economique, 1975"

TABLE 3

TUNISIAN AGRICULTURE - RELATED IMPORTS 1962-1974
(Millions of Dinars)

	1962	1965	1968	1969	1970	1971	1972	1973	1974
Animals and Meat	0.4	0.2	0.7	1.3	2.0	2.5	2.7	3.8	5.9
Dairy Products	1.5	1.3	2.5	3.5	3.0	3.9	4.3	4.8	7.2
Coffee and Tea	2.4	2.3	2.1	2.6	3.2	2.5	3.9	4.0	4.5
Sugar	2.8	3.2	2.9	3.5	4.7	5.9	8.6	8.3	22.9
Wheat	8.1	6.7	9.9	13.7	16.9	11.8	10.2	12.1	21.0
Barley	2.4	1.4	0.6	1.7	0.6	-	-	1.9	2.5
Corn	NA	0.5	0.5	0.1	0.4	0.3	0.7	1.3	1.9
Tobacco	1.0	0.5	0.9	1.1	0.7	0.9	0.9	2.2	2.7
Vegetable Oil	-	2.0	3.6	5.3	7.3	6.8	8.1	8.3	14.5
Other Food	<u>3.3</u>	<u>2.3</u>	<u>4.3</u>	<u>3.6</u>	<u>3.7</u>	<u>10.5</u>	<u>5.8</u>	<u>8.1</u>	<u>12.0</u>
Total Food	21.9	20.4	28.0	36.4	42.5	45.1	45.2	54.8	95.1
Total Imports ^{1/}	90.9	129.1	117.0	139.8	160.4	180.0	222.2	266.0	400.0
Food as % of Total Imports	24.1	15.8	23.9	26.0	26.5	25.1	20.3	20.6	23.8
Wool	-	0.2	0.2	0.3	0.6	0.7	1.0	0.9	1.4
Cotton	0.5	2.6	4.1	4.9	5.0	5.1	2.6	3.4	6.0
Hides and Leather	NA	0.3	0.4	0.6	0.8	0.8	1.1	1.3	1.8
Fertilizer	0.5	0.6	1.0	1.6	0.6	2.0	1.0	2.5	6.0
Agric. Machinery	0.7	2.2	1.7	1.8	3.2	4.3	5.2	6.5	7.5

^{1/} Excluding temporary imports, except for 1974

Source: "Statiques des operations avec l'exterieur au cours de la decennie 1962-1971".
 "Evolution du commerce exterieur de la Tunisie de 1956-1965".
 "Statique du commerce exterieur de la Tunisie", various annual issues.

TABLE 4

GDP IN AGRICULTURE AND IN OTHER SECTORS

Million Dinars at 1966 Constant Prices

	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	Average 1962-71
AGR GDP	92.0	89.0	95.7	99.3	102.5	74.5	63.8	82.9	75.5	77.6	93.3	85.4
Percent Change	+ 8.0	- 3.3	+ 7.5	+ 3.8	+ 3.2	-17.3	-14.4	+29.9	-18.7	+ 2.8	+20.2	-
Average growth rate by period (%)	1962- 1965: + 3.5%		1966- 1969: - 9.6%		1970- 1971: 1971:		- 1.8%					
GDP Other Sectors	276.5	292.4	301.0	319.3	339.2	355.4	370.9	396.0	413.3	432.9	461.0	368.2
Percent	+ 9.5	+ 5.8	+3.0	+ 6.0	+ 6.2	+ 4.8	+ 4.4	+ 6.8	+ 4.4	+ 4.7	+ 6.5	-
Total GDP	368.5	381.4	396.4	418.6	441.7	429.9	434.7	478.9	488.8	510.5	554.3	453.6
Percent	9.1	+ 3.5	+ 3.9	+ 5.6	+ 5.5	- 2.7	+ 1.1	+10.2	+ 2.1	+ 4.4	+ 8.9	-
Average rate by (percent) period	1962 - 1965 = +4.7%		1966 - 1969 = +3.2%		1970-71 = + 7.7%		+ 3.8%					

Source: Ministry of Plan December 1971

TABLE 5

VALUE ADDED IN AGRICULTURE SECTOR
(Constant 1966 prices)

<u>Year</u>	<u>Mil. Dinars</u>	<u>% Change</u>
1970	93.0	
1971	115.1	+ 23.8
1972	154.9	+ 34.6
1973	137.0	- 11.6
1974	155.3	+ 13.4

Source: IV² Plan for 1970-71
Rapport sur le Budget Economique 1975
for 1972-74

TABLE 6

Evolution of the Sub-Sector in Agriculture

(In Million Dinars at 1966 constant prices)

Products	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1962-71
<u>CEREALS</u>												
Value	11.3	23.2	41.2	26.0	32.0	20.5	19.2	23.5	17.3	25.9	30.0	+25.9%
% Growth	-45.8	+105.3	+77.6	-36.9	+23.1	-36.0	-6.3	+22.4	-26.4	+49.7	+15.8	-
Average Rate by Period	1962-	1965 :	1965 :	1965 :	1965 :	1966-	1969-	1969 :	1969 :	70-71:	+32.6%	-1.5%
<u>OLIVES</u>												
Value	39.2	21.2	25.1	35.6	35.9	26.3	17.0	25.4	25.0	17.9	34.3	26.4%
% Growth	+81.9	-46.0	+18.4	+41.8	+8.0	73.3	-35.4	+49.4	-1.6	-28.4	+91.6	-
Average Rate by Period	1962-	1965 :	1965 :	1965 :	1965 :	1966-	1969-	1969 :	1969 :	70-71	+19.8%	-2.5%
<u>LIVESTOCK</u>												
Value	17.4	15.9	20.2	19.0	22.0	27.6	26.9	27.1	24.6	21.8	16.7	22.2
% Growth	-15.5	-8.6	+27.0	-5.9	+15.8	+25.5	-2.5	+0.7	-9.2	-11.4	-23.4	-
Average Rate by Period	1962-	1965-	1965-	1965-	1965-	1966-	1969-	1969-	1969-	70-71-	-17.5%	+2.3%

Source: Ministry of Plan, Tunisia

TABLE 7
 VALUE OF PRINCIPAL CROPS AND LIVESTOCK
 AND PERCENTAGE OF TOTAL FOR EACH 1972 - 1974

SUB-SECTOR	Values expressed in million dinars at constant 1966 prices								
	1972			1974					
	Gross Value	Percent of Total	Added Value	Gross Value	Percent of Total	Added Value			
Cereals (Durum and Bread Wheat, Barley) & Others	45.78	26.78	40.49	44.54	31.45	41.83	40.39	21.92	33.10
Vegetables	24.98	14.61	22.10	21.14	14.94	19.88	26.73	14.51	21.90
Meat (Beef, mutton, goat)	22.85	13.37	20.21	25.43	17.96	23.89	31.97	17.35	26.21
Chickens	5.80	3.39	5.12	6.58	4.65	6.20	8.64	4.70	7.14
Eggs	3.67	2.15	3.25	4.00	2.82	3.75	4.80	2.61	3.94
Horticulture (Exp. Olives)	19.49	11.40	17.23	11.58	8.18	10.88	25.31	13.74	20.73
Olives	32.78	19.17	28.98	13.62	9.62	12.79	23.45	12.73	19.22
Beans and Peas	3.10	1.82	2.75	3.07	2.17	2.88	3.68	2.00	3.02
Industrial (Sugar beets and Tobacco)	0.43	0.25	0.37	0.67	0.47	0.62	0.79	0.43	0.65
Forestry (cork, alpha grass)	0.70	0.46	0.64	0.70	0.49	0.65	1.91	1.04	1.56
Other Products (1)	11.37	6.65	10.05	10.26	7.24	9.63	16.52	8.96	13.53
	170.95	100.00	151.2	141.59	100.00	133.00	184.19	100.00	151.00

Source: Ministry of Plan's Economic Budget for 1974 and it's draft budget for 1975; and the Ministry of Agriculture's draft Economic Budget for 1975.

1. Other Products include: milk, pork, donkey, camel, meat, wool, hair, flax, linseed oil, fire wood, and industrial woods.

TABLE 8

CEREALS: SURFACE, PRODUCTION, AND YIELD

Year of Harvest	Area (1000 ha)			Production (1000 T)			Yield (T per ha)		
	Durum Wheat	Bread Wheat	Barley	Durum Wheat	Bread Wheat	Barley	Durum Wheat	Bread Wheat	
	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	
1964	950	160	615	431	81	182	.453	.506	.295
1965	938	169	582	577	100	272	.615	.591	.467
1966	700	145	377	432	49	135	.617	.338	.358
1967	652	166	338	403	50	120	.618	.301	.355
1968	700	133	365	425	73	200	.607	.548	.548
1969	600	145	250	301	80	116	.501	.551	.464
1970	750	280	410	300	142	207	.492	.536	.505
1971	700	280	350	400	200	160	.571	.800	.457
1972	990	240	335	707	258	289	.820	.910	.710
1973	975	224	360	641	244	363	.700	.930	.680
1974	919	235	398	600	210	515	.790	1.190	.860

(1) A small amount of other cereals are included with Barley.

Source: Report of study by Kansas State University for USAID "Grain Storage and Marketing 1974". Data on production and area for 1974 were obtained from the Ministry of Agriculture Economic Budget 1975; also yields statistics were obtained for 1972, 1973, and 1974 from a report of "The Accelerated Cereals Project for 1974", and the Ministry of Agriculture's Economic Budget for 1975.

Other adjustments were made for years 1970 to 1974 to correspond to new 1974 data from the Ministry of Agriculture.

TABLE 9

ANIMAL PRODUCTION
QUANTITY EXPRESSED IN METRIC TONS
VALUES EXPRESSED IN 1000 DINARS AT 1966 CONSTANT PRICES

	1970		1971		1972		1973		1974	
	Q	V	Q	V	Q	V	Q	V	Q	V
Meat (Live Weight)										
Beef	30,900	7,010	27,500	6,992	30,400	6,992	34,000	7,820	47,300	10,879
Mutton	42,000	13,800	36,600	12,078	42,000	13,860	50,000	16,500	57,400	18,942
Goat	5,000	1,200	7,500	1,800	8,350	2,004	8,800	2,112	9,000	2,160
Pork	170	40	240	62	350	91	350	91	400	94
Donkey	1,640	200	2,100	273	1,650	215	1,650	215	1,700	215
Camel	2,460	430	2,040	357	2,400	420	2,400	420	2,400	420
Chickens	13,600	4,720	14,600	5,110	16,800	5,800	18,800	6,580	24,700	8,645
SUB-TOTALS	95,770	27,400	90,500	26,005	101,950	29,462	116,000	33,738	142,900	41,352
Milk										
Cow	140,000	7,100	143,000	7,293	107,000	5,457	120,000	6,120	192,800	9,833
Sheep	21,000	1,100	19,000	1,064	16,100	902	17,300	969	26,200	1,467
Goat	28,000	1,200	30,000	1,350	15,000	675	16,200	729	19,800	891
Eggs	10,750	3,200	14,000	4,284	12,000	3,672	13,100	4,009	15,700	4,804
Wool and Hair	5,500	1,800	4,700	1,598	5,230	1,778	5,520	1,877	6,500	2,210
SUB-TOTALS	-	14,400	-	15,589	-	12,484	-	13,704	-	19,205
T O T A L :	-	41,800	-	41,594	-	41,946	-	47,442	-	60,557

Source: Ministry of Agriculture's Publication: "Les Realisations dans le secteur agricole entre 1970 et 1974", dated October 1974.
 Data for 1974 was obtained from the Ministry of Agriculture's "Draft Economic Budget" for 1974.

TABLE 10

PRODUCTION OF HORTICULTURAL CROPS

Quantity Expressed in Metric Tons

	<u>1970</u>	<u>1971</u>	<u>1972</u>	<u>1973</u>	<u>1974</u>
Olives	125,000	450,000	900,000	375,000	660,000
Table Olives	4,600	7,000	7,500	6,400	9,200
Agrumes	101,000	77,000	120,000	75,000	107,000
Dates	46,000	39,000	42,000	52,000	58,000
Wines Grapes	73,000	124,000	142,000	133,000	155,000
Table Grapes	17,000	27,000	20,400	22,000	24,800
Almonds	10,500	13,000	15,000	20,000	22,700
Other Fruits	57,100	55,300	42,800	61,000	68,500

Source: Ministry of Agriculture's publications "Les réalisations dans le secteur agricole entre 1970 et 1974 dated October 1974. Data for 1974 were obtained from Ministry of Agriculture's draft Economic Budget for 1975.

TABLE 11

EXTENSION PERSONNEL

	<u>Central Stations</u>	<u>Regional Stations</u>	<u>"Offices"</u>	<u>Total</u>
Agriculturist (Post Graduate degree or Equivalent Experience)	137	5	31	173
Agriculturist (B.S. equivalent)	194	103	90	387
Assistant Agriculturist (Post High School training)	24	87	118	239
Assistants (Some High School and Special Training)	300	294	464	1,058
Agents (Primary School and Special Training)	462	1,130	230	1,822
	<hr/>	<hr/>	<hr/>	<hr/>
T o t a l	1,117	1,619	933	3,679

Source: Ministry of Agriculture Bulletin July, August, September
1974 Special Issue, Tunisia

TABLE 12

Number of Professional Personnel
Trainees for Agriculture During 1971-1974

	<u>1971</u>	<u>1972</u>	<u>1973</u>	<u>1974</u>
Agriculturists (B.S. Equivalent)	40	33	47	67
Assistant Agriculturists (Post High School Training)	19	123	55	124
Agricultural High School Graduates	45	732	<u>1/</u>	431
Graduates of Professional Agricultural Centers (Less than High School)	1,226	1,269	1,973	1,908
Fishery Specialists (Graduates of Professional Fisheries Centers (Less than High School)	117	135	231	367

1/ Additional year added to curriculum

Source: Ministry of Agriculture Bulletin
July, August, September 1974 Special Issue

TABLE 13

INVESTMENTS IN AGRICULTURE IN 1972 - 1973

(In 1,000,000 Dinars)

	<u>1972</u>	<u>1973</u>	<u>1974</u>
Reforestation and Soil Conservation	4.7	2.2	4.1
Water Resources and Irrigation Development	6.7	5.0	6.6
Agricultural Materials	5.3	5.5	6.8
Horticultural Crops	3.3	5.8	6.0
Animal Production	1.7	3.5	4.4
Research and Extension	1.9	2.2	3.8
Fisheries	1.0	2.1	4.3
Others	0.3	4.2	6.2
T o t a l	<u>24.9</u>	<u>30.5</u>	<u>42.2</u>

Source: Budget Economique
for 1974 and 1975

TABLE 14

LAND TENURE AND FARM SIZES (1974)

<u>Type Ownership</u>	<u>No. of Farms</u>	<u>Area (Thousand Hectares)</u>
<u>Private</u>		(4,517)
1-5 ha	131,600	304
5-10 ha	72,300	507
10-20 ha	63,300	879
20-50 ha	41,500	1,287
50-100 ha	8,000	541
100-200 ha	2,600	372
200-500 ha	1,150	356
500 ha +	400	271
<u>Public</u>		(816) ^{1/}
Miscellaneous		92
Agrocombinates	25	68
Pilot, educational farms	-	48
Northern co-ops	218	202
Co-ops in center and south	347	200
To be sold to young farmers		112
To be sold at public auction		<u>94</u>
 T o t a l		 <u>5,333</u>
 Forests		 1,240
 Tribal lands (extensive pasture)		 <u>2,550</u>
 T o t a l		 <u>9,113</u>

^{1/} State lands totalled 816,000 hectares in 1974 according to the Special Bulletin published by the Ministry of Agriculture in September 1974. The TVA total was 724,000 hectares which was corrected to 816,000 hectares.

Source: Ministry of Agriculture (taken from Report by TVA on Marketing and Distribution of Fertilizer in Tunisia - 1974)

TABLE 15

PRODUCTION AND YIELDS BY TYPE OF TILLAGE
ON CEREAL FARMS (1971-72 CROP)

Regions	Production in 1,000 MT and Yield Expressed in MT's per hectare																			
	Superficial Cultivation		Animal Traction		Area Deep Ploughed by Mech. Traction		Area Cult. by Rented Mech.		Area in Mixed Tech. Farms											
	Yield	Prod.	Yield	Prod.	Yield	Prod.	Yield	Prod.	Yield	Prod.										
I:																				
a. Durum Wheat	.887	22.89	.911	26.97	1.117	91.26	.999	49.58	.967	76.56										
b. Bread Wheat	1.225	6.13	.861	3.44	1.268	64.67	1.242	10.06	1.116	13.50										
II:																				
c. Barley and Others	.739	2.51	.789	16.25	1.225	37.98	1.143	24.69	.972	40.94										
III:																				
a. Durum Wheat	.966	117.66	1.064	44.37	1.408	271.18	.967	86.66	.997	131.00										
b. Bread Wheat	1.302	29.55	.879	1.76	1.364	80.89	1.301	17.56	1.248	19.34										
IV:																				
c. Barley and Others	.988	41.00	1.120	23.97	1.244	25.63	.988	34.08	1.039	58.05										
a. Durum Wheat	.336	1.28	.362	41.77	.426	55.72	.423	46.69	.392	88.46										
b. Bread Wheat	.223	.29	.416	15.89	.576	27.36	.564	22.58	.492	18.47										
IV:																				
c. Barley and Others	.339	.92	.521	55.17	.638	36.62	.623	30.65	.553	85.82										
a. Durum Wheat	.306	31.86	.334	10.96	.375	8.93	.375	7.62	.321	50.39										
b. Bread Wheat	.293	6.45	.320	2.94	.415	4.48	.415	3.82	.326	13.21										
IV:																				
c. Barley and Others	.353	13.56	.411	16.15	.675	19.78	.675	16.74	.453	46.45										

Region I (Tunis, Bizerte, Nabeul)
 Region II (Beja, Jendouba, Kef)
 Region III (Karaouan, Kasserine, Sousse)
 Region IV (Gabes, Gafsa, Sfax, Mesnine)

Source: Draft Research by Dr. T. Roe, University of Minnesota Team, for BFE, Ministry of Agriculture, 1974

TABLE 16

SHORT TERM CREDIT

	<u>1971</u>	<u>1972</u>	<u>1973</u>
Amount in 1,000 Dinars	3.9	5.0	5.6
Number of Borrowers	18,364	13,923	17,025

Source: Ministry of Agriculture Bulletin
July, August, September 1974 Special Issue

This represents short term credit provided under the "Supervised Credit" program and does not represent the total short term credit for all of agriculture. This does not include the "Credit-in-kind".

TABLE 17

MEDIUM AND LONG TERM LOANS
(1971-1974)

	<u>1971</u>	<u>1972</u>	<u>1973</u>	<u>1974</u> (Estimates)
Amount (in 000 dinars)	3.5	7.0	8.1	13.0
Number of Borrowers	37,000	61,000	69,500	90,000

Source: Ministry of Agriculture Bulletin
July, August, September 1974 Special Issue

TABLE 18

FERTILIZER DISTRIBUTED

(Expressed in Units of Plant Nutrients)

	<u>1971-72</u>	<u>1972-73</u>	<u>1973-74</u>
Nitrogen	775	13,400	22,445
Phosphate	16,050	17,650	19,900
Potash	2,500	3,500	4,000

Source: Ministry of Agriculture Bulletin
July, August, September 1974 Special Issue

TABLE 19

CEREAL PRODUCTION ON AGRO-COMBINAT
 (STATE DIVERSIFIED AGRICULTURAL CENTER)
 1971-1972
 (AREA EXPRESSED IN HA. PRODUCTION AND YIELDS
 EXPRESSED IN METRIC TONS)

	<u>Durum Wheat</u>	<u>Mexican Bread Wheat</u>	<u>Ordinary Bread Wheat</u>	<u>Barley- Oats</u>
<u>Region I</u>				
Area	484.00	678.00	291.00	436.00
Prod.	866.60	1,713.50	374.40	578.70
Yield	1.85	2.53	1.29	1.33
<u>Region II</u>				
Area	1,586.00	374.00	411.00	440.00
Prod.	2,492.20	785.50	410.10	474.10
Yield	1.57	2.10	.99	1.08
<u>Region III</u>				
Area	25.00	400.00	499.00	573.00
Prod.	8.10	496.60	578.50	422.80
Yield	.32	1.24	1.16	.74
<u>Region IV</u>				
Area	30.00	-	95.00	113.00
Prod.	7.50	-	63.80	33.90
Yield	.25	-	.67	.30

Source: OTD

Region I (Tunis, Bizerte, Nabeul)
 Region II (Baja, Jendouba, Le Kef)
 Region III (Kairouan, Masserine, Sousse)
 Region IV (Gabes, Gafsa, Sfax, Medenine)

Source: Draft Research Report by Dr. E. Ros, University of Minnesota
 Team for Bureau of Plan, Ministry of Agriculture, 1974

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A N N E X B

A SURVEY OF THE TUNISIAN
HEALTH SITUATION

This report was prepared by Mr. Lynn Beamer, DHEW/OIH, in cooperation with the USAID/Tunis Mission.

December 1974

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I. Survey of the Health Situation

A. Mortality and Morbidity

The health status of the Tunisian population has improved markedly over recent years but lags well behind the levels of the developed countries. The data vary considerably but by comparison with the period at the end of World War II the mortality rate per thousand has fallen from 27 to the 11-16 range while infant mortality has declined from 220 to an estimated 100. In keeping with this drop in mortality the expectation of life at birth has risen from 30 years to over 51 years. Even with a considerable level of underreporting of infant and childhood mortality in the rural areas, nearly one-half of all deaths reported are children under 5 years of age. (See Table 1). Although data are not available there is thought to be wide variation in mortality rates between those of the middle and upper socio-economic classes, whose standard of living is comparable to a similarly placed European population, and the lower classes.

Some of the major communicable diseases of former years such as small-pox, typhus, typhoid, malaria, poliomyelitis and diphtheria have been largely brought under control through vaccination programs. The immunization procedures carried out in 1970 are shown in Table 2. These preventive measures are, however, carried out sporadically rather than on a regularly scheduled basis. It is interesting to note that the diseases in which the most progress has been made are those which are most susceptible to preventive measures.

The pattern of childhood morbidity and mortality has shifted so that the incidence of polio, diphtheria, whooping cough, and tuberculosis has been considerably reduced, while gastro-intestinal infections, upper respiratory infections, and skin disorders have become relatively more important. The incidence and severity of these conditions are not quantified and rest on the views of experienced observers. They are closely related to the prevalence of malnutrition, undernutrition, and the generally low level of environmental sanitation.

For the population as a whole the major disease problems are tuberculosis, respiratory infections, gastro-intestinal and parasitic infections, eye diseases, skin diseases, schistosomiasis, and venereal diseases. Morbidity data are very incomplete. Even those diseases for which reporting is required are understated because they are derived from health facilities reports and would neglect cases which do not come to a health facility or are not diagnosed by a physician. Nevertheless, Table 3 gives an indication of the levels of reported disease incidence for the years 1969-71.

Tuberculosis is a major health problem with an estimated 250,000 cases. The crowded and unsanitary living conditions are predisposing factors in its spread. Considerable stress has been laid upon immunization, diagnosis and treatment. A compulsory program of BCG vaccination for all persons under age 20 began in 1959, and recent estimates show that a little under 80 percent of the people in that age group have been reached. There are three specialized hospitals for tuberculosis and lung diseases with a capacity of 948 beds.

Skin diseases are very common; there were an estimated 900,000 treatments for scabies and dermatitis in 1970. Many of these conditions are aggravated by unsanitary living conditions, poor nutrition, and the state of personal hygiene.

Schistosomiasis represents a significant health problem in the southern and southwestern parts of Tunisia where there are an estimated 20,000 cases. Epidemiological and malacological surveys have been carried out in cooperation with WHO. At present there are over 400 sources under surveillance, while fewer than 20 were positive after one year of treatment of water with molluscicides (Bayluscide), there has been a problem of foci becoming reinfested with the intermediate host. One result of surveillance activities has been the discovery of a new focus of infection at Hadjeb El Aioun, some 140 kilometers north of any previously known infected area and only 200 km from Tunis. In 1973 there were 9,557 cases detected out of 135,600 urine examinations. Authorities state that the population shows a positive attitude both to urine sampling and drug treatment. Results of one group of 827 cases treated with Ambilhar in Gafsa Gouvernorate claim a 90.9 percent cure rate.

Although the exact number of persons infected may be open to question, it is clear from the available data that there is a significant level of infection of the population at risk. The danger of spreading the disease should be an important consideration in any water resource development project.

Trachoma is endemic and is particularly common in areas with low standards of living. It is primarily a disease of very young children and according to the findings of a PL 480 Special Foreign Currency Project, in some villages infects almost the entire population by the age of two years. The disease tends to subside by age 15 but by that time has had a permanent effect on vision. In the more seriously affected areas, up to 15 percent of the adult population have economically significant visual loss. With such a large percentage of children in the total population, the incidence of this disease will have serious consequences for the adult population of the future. Controlled trials are being carried out in Tunisia with PL 480 Special Foreign Currency Program support by University of California at San Francisco and Tunisian scientists to test the effect of various chemotherapeutic measures.

Tunisia has had a malaria control program since the 1930's. Although the threat of the disease has been significantly reduced (there were 19 cases reported in 1972, 4 in the consolidation area and 15 in the attack area), it continues to require operations and surveillance to maintain the gains achieved. The financial costs of anti-malaria activities have been sizable; expenditures in 1971 by the national government, AID, UNDP, and WHO came to \$879,000. Based on the epidemiological situation the country is divided into two operational areas: the three southern gouvernorates (Gafsa, Gabes, and Medenine with a population of nearly one million) are in the attack phase; the remaining gouvernorates (population 4.6 million) are in the consolidation phase. The malaria service Plan of Action calls for geographical reconnaissance, spraying with DDT and anti-larval operations. There is sometimes a serious decline in the quantity and quality of surveillance activities because of the periodic need to transfer malaria program personnel to other activities.

There are periodic outbreaks of cholera. One of the most recent - during period July 24 - December 14, 1973 - had a 26 percent fatality rate among the approximately 200 cases reported. In addition to the morbidity and mortality from the disease, there was considerable disruption to the malaria and schistosomiasis programs as a result of personnel being transferred for duties in the cholera emergency.

Vaccination against smallpox is compulsory and there has been no incidence of the disease for several years.

There is a significant prevalence of leprosy in the Gouvernorates of Sousse, Sfax, Gabes and Medenine, with an estimated 500 cases. WHO has recommended an integrated leprosy control program in the areas at risk including training courses for the necessary personnel.

Typhoid is an endemic disease with 978 cases reported in 1971 and 904 in 1972. Personnel have been assigned from other programs, particularly malaria and schistosomiasis, for use in typhoid outbreaks.

B. Environmental Sanitation

Although exact data on the incidence of the various diseases related to inadequate or unsafe water supplies and sewage disposal are not available, several sources cite these factors as the bases of a major health problem. The data show that there is heavy infant and childhood mortality and by inference the conclusion can be drawn that enteric infections (e.g., amoebiasis, cholera, typhoid, paratyphoid, hepatitis, salmonellosis, shigellosis, poliomyelitis and enterovirus infections) along with some parasitic and helminthic infections, contribute to morbidity and mortality of the young as well as their elders.

Ready availability of sanitary facilities is not enough in itself to control the incidence of disease if the population does not at the same time adopt habits of personal hygiene. The location of piped water and latrines are also important variables in any attempt to improve environmental sanitation. For example, estimates of the number of liters of water used per capita per day are 5 - 10 from public standposts and 100 - 150 from house connections. This differential usage due to the greater ease of access of house connections has a direct effect on the willingness to use water for drinking, cooking and washing. However, it has been shown that sanitary conditions properly used have a very important effect on the health of the population and particularly on the health of the younger members of the population.

Tunisia has a problem of adequacy as well as purity of water supplies. The northern part of the country has generally adequate amounts of water but in the south there are shortages during the summer months. The major cities, such as Tunis and Sousse have central distribution systems which use purification chemicals but many smaller cities and rural areas have water that is not potable (due to salinization of ground and surface water) and/or unsafe.

The tables shown as Table 4 and 5 give data on the population served by community water supply systems and sewage disposal facilities and Tunisian targets for the population to be served by 1980. The level of expenditure in

1970 for environmental sanitation facilities, including national and external sources, was broken down as follows (in thousands of dollars) :

	<u>Urban</u>	<u>Rural</u>	<u>Total</u>
Community water supplies	6,090	500	6,590
Sewage disposal	700	-	700
Total	6,790	500	7,290

The proposed expenditures over the decade 1970-80 are shown below (in thousands of dollars) :

	<u>Urban</u>	<u>Rural</u>	<u>Total</u>
Community water supplies	36,300	5,200	41,500
Sewage disposal	63,600	-	63,600
Total	99,900	5,200	105,100

On the basis of these projections there seems to be a wide disparity between the priorities for urban and rural environmental sanitation with twenty times as much funding scheduled for the former as for the latter while the population distribution is perhaps 60 percent rural.

Tunisian officials have ranked the constraints they foresee in implementing the proposed projects to reach their environmental sanitation goals. For community water supplies these constraints are :

1. Insufficient internal financing.
2. Insufficient external assistance.
3. Insufficient local production of materials.
4. Lack of trained personnel.

For sewage disposal the stated constraints are :

1. Insufficient internal financing.
2. Insufficient external assistance.
3. Lack of a national organization responsible for the program.
4. Other, miscellaneous.

Since these constraints were originally drawn up it would seem that

the Tunisian financial situation has improved materially with sharply higher exports earnings for 1974. Also, the lack of locally produced materials should be less a problem in view of the increased ability to import materials with a favorable trade balance. Perhaps, the greatest constraint on better environmental sanitation, particularly in rural areas, has been a lack of interest and leadership in developing programs. It should be noted that in late November, 1974, the GOT announced the establishment of a National Office of Environmental Sanitation. It will apparently have broad authority in the field, but detailed information on its program and budget is not yet available.

C. Nutrition

From an agricultural point of view Tunisia can be divided into northern and southern regions. The northern coastal areas have a typical Mediterranean climate and produce grains, citrus fruit, garden vegetables and grapes. In the north central area grains and livestock are raised, while the northwest is primarily suited for growing cork oak. To the south there is less water, and vegetation and the principal agricultural products are olives and grapes. Further south the vegetation becomes progressively more sparse and agricultural production is limited to camel and sheep raising, small areas of pasturage, and dates.

Of the total land area of 16.2 million hectares about 26 percent is arable, 14 percent is pasture, 8 percent is forests, and the balance is desert or otherwise unsuitable for agricultural purposes. Of the land under cultivation about 90 percent is devoted to cereal production, olive groves, fruit trees, and vineyards, with the balance in vegetables and other commodities.

Data on food crop production is included in the sector analysis on agriculture. Although the quantities have varied, since 1960 Tunisia has imported more grain than it has exported. For the period 1960-64 imports exceeded exports by about 150,000 tons; for 1965-69 the difference in imports rose to 300,000 tons.

The diet of most of the population consists mainly of carbohydrates with only occasional animal proteins. The staple dish in the countryside, and to a lesser extent in the cities, is couscous prepared from semolina. This is eaten with small amounts of meat, if available, or vegetables that are in season. A similar dish (burgol) is made from barley. Although both the urban and rural population rely heavily on wheat products, there is a difference in consumption patterns: the semolina for couscous is made from durum wheat while in the cities, bread from bread wheat is used three times as much as the durum products. In the south, dates are a dietary staple but are little used in other parts of the country. Some areas of the south also make use of camel and goat milk to make yogurt and cheese. Tea is the national beverage, but coffee has some popularity in the cities. Generally speaking, the diet of the bulk of the population consists almost entirely of cereals, vegetables, and oils.

Although the population is not faced with stringent dietary taboos, other than the use of pork in a Moslem country, habits, tastes, and traditions, to say nothing of income levels and food availability, stand in the way of good nutrition. Tea or coffee, with or without bread, is a common breakfast for all classes. Afternoon and evening meals are chiefly couscous, some form of macaroni or bread, with higher income levels having meat stews or fish as well. Wealthier people may also include some type of fruit. An extensive study made of relatively wealthy, middle level, and poor people in the suburbs of Tunis showed that if more resources were available to them, the middle level and poor people would prefer to consume still more couscous followed by more meat. None of the groups would elect to eat more legumes which would give them a more balanced diet at little extra cost. In Tunisian society, as in others, the social environment is a principal determinant in dietary beliefs and practices.

Studies of the diets of pregnant women have shown that they, like the population in general, have a diet that is almost exclusively carbohydrates with practically no protein or animal fat. As a result, children are born with a protein deficit because the mother has little protein to give. Infant diets are deficient in part due to prolonged nursing with no supplemental foods, and low protein/calorie levels on weaning. Infants may be fed the nut of the pine cone, sesame seeds, and crushed chestnuts mixed with oil and sugar. A porridge made of wheat flour, chick peas, olive oil, and spices is also commonly given to babies. Children of one to two years of age are also poorly fed. The diet may consist of bread, noodles and spices, and is low in proteins, vitamins and minerals.

A number of studies have been made over the years of the nutritional status of the Tunisian population. They vary in their estimates of under-nutrition and malnutrition, but uniformly conclude that there is a substantial nutrition problem. As a generalization it can be said that a relatively high proportion of the population has a diet which does not provide enough calories. Even though there is a very high carbohydrate content, it is deficient in protein, particularly animal protein, and does not have adequate vitamins and minerals.

Although perhaps somewhat outdated, an interesting and comprehensive study was made in 1960 in a suburb of Tunis. A carefully drawn sample divided the population into three groups according to high, medium and low incomes. The per capita daily calories available to these groups were 2,280, 1,580, and 1,125, respectively, with an average of 1,568. The tables 6 and 7 provide detailed breakdowns of the amount of nutrients available to the three groups on a per capita/daily basis and the percentage excess or deficits those nutrients represent of the nutritional norms set for the study. The deficits shown are substantial and apply to all classes of nutrients for the medium and low income groups and in several instances, for the high income group as well.

More recently a general survey of the entire country made by the Secretariat of State for Planning and National Economy in 1966 covered 7,147 house-

holds and 42,859 people. This study provided much of the background data on Tunisia which was presented at the jointly sponsored (Government of Tunisia and USAID) Third African Conference on Nutrition and Child Feeding which was held in 1970. The results of this large scale survey showed a somewhat brighter but still serious outlook in that 25 percent of the total population received less than 2,000 calories per day (and less than 50 grams of protein), while another 29 percent has 2,000 - 2,500 calories per day and between 55 - 70 grams of protein. As shown in other surveys, the urban areas generally have a better and more balanced level of nutrition. Table 8 provides a detailed breakdown of the findings of this study.

AID is currently cooperating with the National Institute of Nutrition and Food Technology in a national survey to assess the nutritional status of the population. A scientific sample of 15,000 persons is being tested for a wide range of nutritional variables. This survey, in addition to the data it will develop, has an important effect on training of personnel and development of the Nutrition Institute. As the result of the level of endemic goiter in one of the regions under study, the use of iodized salt has been introduced throughout the country. The scheduled field work should be completed by June 1975.

While the exact status of undernutrition and malnutrition in the Tunisian population may be open to question, all of the research and expert observations available describe nutrition as a major problem. The effects of a poor diet are shown in the inability to do a full day's work or concentrate on studies at school. The problem is especially acute for small children and pregnant women and lactating mothers. There is a close relationship between the high level of infant and childhood mortality and the state of nutrition. In underdeveloped countries, deaths due to poor nutrition and diarrhea may be 100 times as great for children under one year as in developed countries, while the mortality rate for children ages one to four years may be 500 times as great. Mortality due to communicable diseases is high and the production of antibodies following immunizations is greatly diminished.

Average levels of nutrition of course do not tell the whole story. The state of individual nutrition involves a complex of factors: the availability and demand for various foodstuffs; the income level and subsequent ability of the individual to satisfy that demand; the age, sex, weight, level of activity and state of health of the individual. These factors and the environment in which he lives, all have a bearing on the nutritional state.

The study presented at the Conference on Nutrition and Child Feeding showed that on the average the per capita cash income was 72 dinars per year. Of this amount, one-half is spent on food (an earlier study of rural family budgets showed 59.9 percent spent on food). This sum would, at the time the study was prepared, provide the equivalent of 2,360 calories per day, which would be sufficient by the standards of a joint FAO/WHO ad hoc Expert Committee for an adolescent female age 10-12 years. Table 9 gives the

findings of the Conference on the sources from which calories are derived, and the average daily protein intake, by area of habitation.

The diet that appears to be available, on the average, shows that about two-thirds of the caloric intake is carbohydrate. Protein levels, at least as estimated in this study, appear to be adequate but the amount of animal protein as a proportion of the total is below an acceptable level.

It is difficult to overstate the importance of good nutrition to the health of the population. A number of experts have concluded that the main factor responsible for the nineteenth and twentieth century decline in mortality in the developed countries was better nutrition rather than improved medical care. A Central American study has shown that an adequate diet, particularly for children, can have a more beneficial effect than a combination of quality medical care and adequate environmental sanitation.

The effects on the Tunisian population of various dietary deficiencies have been cited in studies, reports and through the impressions of expert observers. Some of these deficiencies, the diseases or conditions they produce, and the incidence, are as follows:

Vitamin A deficiency is often associated with protein-calorie deficiencies and mainly affects infants and children up to five years of age. An early symptom is night blindness; a more serious manifestation is xerophthalmia which may lead to total or partial blindness. The incidence of this deficiency is considered to be very common; one estimate places it at one-third of the population.

Lack of Vitamin B1 (Thiamine) occurs in people of all ages and can be particularly common in pregnant and lactating women. Insufficient quantities in the diet can cause neuritis and polyneuritis. Breast-fed infants two to five months of age are especially susceptible.

Vitamin C deficiencies have been noted in both infants and adults, with an estimated 10-20 percent incidence.

Vitamin D deficiency and a negative balance of calcium and phosphorus lead to rickets in infants and children (estimated at 2-30 percent of the population under age 20) and osteomalacia in adults (females up to age 45 are affected at a 12-25 percent rate). Local customs of keeping children indoors out of the sunlight contribute to lack of vitamin D. Dental defects, in part due to calcium deficiency, are estimated to affect 5-25 percent of children and 30 percent of adults on the average.

Estimates of protein-calories malnutrition show considerable variance but there is a consensus that it is a serious problem. Underweight conditions (20 percent) and growth retardation (13 percent) are related to PCM and it particularly affects children under three years of age. A population thus weakened is particularly susceptible to various water-borne infections and gastroenteritis. Incidence of kwashiorkor is estimated at .25 to .50 percent with a high ratio of mortality to incidence.

Lack of iodine leads to an estimated incidence of endemic goiter in 5 percent of the population, primarily in inland mountainous areas, although

it is expected that this condition will diminish following the use of iodized salt in those areas.

Poor nutrition is evident particularly in children other than in the diseases caused by nutritional deficiencies. Children are commonly stunted, pale, and thin, lips and tongues often show cheilosis and fissures. The skin may be thickened, cracked, and show various types of dermatitis. One study made in 1956 showed the following incidence of such conditions: lesions of the tongue 20 percent; thickening of the skin 16 percent; gum bleeding 17 percent; cheiloses 11 percent.

D. Population and Family Planning

The current population of Tunisia is about 5.5 million. The data vary with the source chosen and the periods to which they refer, but the estimated natural increase of population is variously shown as between 2.3 and 3 percent. The lower rate is generally considered more nearly correct. At these rates of increase, the population would double in 23 to 30 years.

Although recent data are more encouraging, with an estimated birth rate of about 38 per thousand, a useful perspective of Tunisian demography can be gained by the following comparison with U.S. experience during the period 1965-70. The rates shown are per thousand:

	<u>Tunisia</u>	<u>U.S.</u>
Marriages	7.2	10.9
Crude births	46.3	15.6
Fertility <u>a/</u>	131.2	59.3
Crude deaths	16.0	9.4
Infant deaths <u>b/</u>	125.0	18.5
Natural increase <u>c/</u>	30.3	6.2
Expectancy at birth (male & female)	51.7 years	71.1 years

a/ Fertility rate = the number of live births per 1,000 females age 10-49

b/ Infant death rate = number of deaths of children under one year per thousand live births

c/ Natural increase rate = crude birth rate minus the crude death rate

Source: United Nations Demographic Yearbook, 1972.

In line with this relatively high rate of natural population increase, about 45 percent of the total population is under age 15. A young population of this order has clear implications for demands upon education, nutrition, health services, employment, and other resources of the society.

The Tunisian Government has recognized the problem associated with

rapid population growth and has broad political and religious support for its national family planning program. Restrictions on the sale of contraceptives were abolished in 1961. Abortion laws were amended in 1965 and again in 1973. At the present time, abortions may be performed by a qualified physician for social or medical reasons during the first three months of pregnancy. After that time they may be done for medical reasons. Other legislation has also been directed at restraining population growth: raising the minimum ages for marriage, abolishing polygamy, and a limitation on family allowances to include only the first four children. In recognition of the importance of a national family planning effort, the National Office of Family Planning and Population (ONPFP) was established in 1973 as a semi-autonomous agency under the Ministry of Health.

Official sanction for family planning was translated into programs in 1964 when the Ministry of Health, working with the Ford Foundation and the Population Council, began a pilot project of providing information on birth control techniques. A previous survey of women of child bearing age had shown that a significant proportion of them wanted no more children. The Government then used a variety of communication channels to support the effort and set up family planning centers and mobile units to provide information, insert IUD's and dispense pills. Initial results were encouraging with 28,000 women visiting centers and 18,000 accepting IUD's. However, later results showed that many of the women who were original acceptors were not prepared for the side effects of the pills or the IUD and did not continue with their use for more than a few months. It was found difficult to sustain the interest and acceptance of a largely unsophisticated population in procedures which are inconvenient, uncomfortable, and require personal discipline for a purpose at odds with long standing social and economic factors.

The family planning program has nevertheless grown through the years so that of the 500 or so health facilities of the Ministry of Health, which include the MCH/Family Planning Centers and hospitals and dispensaries of all levels, over 300 now provide counseling and/or contraceptive services. Table 10 provides the numbers and locations of these family planning activities.

Despite considerable expansion of facilities, government and external support, publicity and public education, the program made only modest progress until the last year. An estimate of the total number of acceptors is now about 7 percent of some 800,000 married women of child bearing age. The number of births averted as the result of the national family planning program was estimated at 12,000 in 1971 and is projected to reach 30,000 in 1976. Table 11 provides data on consultations and types of services for the year 1972 by the type of center providing the service. The demographic effect of tubectomies and abortions is reasonably clear. The total number of actual users and thus the effect of other methods is more difficult to ascertain with the possibilities of non-use or misuse of pills and condoms, the possibilities of

expelling IUD's, and unwillingness or misunderstanding that might result in advice not being followed. A recent study made by the ONPFP and the Population Council of over 1,200 users of the pill or the IUD in Tunisia found that after one year continuation of IUD use was 72 percent and 45 percent for the pill. After three years the rates were 46 percent for the IUD and 17 percent for the pill.

The family planning goals for 1974 are : 17,000 new IUD insertions; 11,000 new pill users; 8,500 tubal ligations; and 10,000 social abortions. Comparison of these goals with the 1972 results shows a marked increase in the public's use and acceptance of family planning except in the use of oral contraceptives, which has declined.

Some of the difficulties of the family planning program have been the result of manpower shortages, the administrative structure, and failure in managing and promoting the program. It is nevertheless striking that 500 or so health facilities, with tremendous numbers of medical consultations for all purposes, have attracted such a relatively small number of family planning acceptors. For example, the existing 90 MCH/Family Planning Centers are designed to provide, in addition to family planning, prenatal and postnatal care to women and outpatient services to children age six and under. Data for 1971 show that compared with the total number of births for the year (192,000) the Centers were little used for prenatal (16,949) or postnatal (5,691) examinations, i.e., for care of women. While 29 centers did not provide such services, 38 of the remainder had only 2-20 consultations per week and only 22 had more than 20. Also, in 1972 the Centers provided about 11,000 new acceptors with pills or IUD's. However, 94,328 children under one year of age, or about one-half of the total number of children born that year, were first time visitors to the Centers. Also, for all children ages 0-6 there were 760,155 consultations, although some of these undoubtedly count the same child more than once. It seems clear that the Centers are heavily used for children but very little used by their mothers. Since the mothers accompany these young children to the Centers, it seems that a perfect target group for family planning information and services presents itself to the Centers in large numbers, albeit for the purpose of receiving services for the children, but do not become acceptors of family planning in anything like the total numbers they represent.

The reasons for this are numerous and complex. First, distances from Centers and poor scheduling sometimes require women to make several trips to the Center to receive the services they seek. Second, there has been a general requirement for examinations by OB/GYN specialists, when there are only 18 Tunisians gynecologists (16 of them in Tunis) and a limited number of foreign specialists. This seriously reduces the number of services

that can be officially approved although they could be provided by lower level personnel. Third, the apparent emphasis on children in the Centers with lack of interest in the mothers. Fourth, the limited availability of counselling and education in the Centers which would be particularly useful if it could be provided while women were waiting with their children (a Dutch team has successfully used such an approach).

The policies and training programs proposed by the ONPFP in its new 1974-1977 Program provide an improved basis for dealing with many of these problems. Greater responsibility is to be given midwives in providing services. Completion of an A.I.D.-financed renovation program will provide better organization of space in the Centers for educational activities, and the Ministry now plans to establish a committee to coordinate family planning, nutrition, and child health activities. Acceptance of surgical means of family planning, and the total of births averted, have increased substantially in the last year. However, it is questionable whether this rate of increase can be maintained. Key needs of the program are set out at later points in this paper.

II. Health System Organization and Resources

A. Health Services Organization

The health services of Tunisia are under the direction of the Minister of Public Health. At the Ministerial level, coordination is maintained with other government departments and with international organizations, foreign governments, and voluntary agencies. An Administration Council composed of cabinet level members advises the Ministry of Health on administrative matters. A Higher Public Health Council composed of the Directors of the Institutes and other eminent physicians advises the Minister on technical matters. It is at the Ministerial level that activities of the various government departments are coordinated: with Education, on standards of training health manpower; with Defense, on hospitalization of military personnel and cooperation for disaster relief; veterinary services with Agriculture; and public health aspects of social assistance and occupational health with Youth, Sports, and Social Affairs.

Below the Ministerial Policy setting level is an Inspector General and three major Divisions: General Administration (devoted to administrative, financial and personnel functions), Hospital-Sanitary, and Preventive and Social Medicine. Below these national level Divisions are non-physician Regional Administrators who are charged with overseeing all health activities in their geographic areas of responsibility. As a generalization, the Ministry suffers from lack of continuity in terms of a permanent civil service at the higher levels, lack of technical expertise at both high and mid-levels, and a lack of clear guidelines for the duties and functions of the various subordinate levels.

The Hospital-Sanitary Division absorbs the great bulk of the national health budget and is devoted to curative medicine. It directs the national network of hospitals (general and specialized hospitals, regional hospitals, rural hospitals, and dispensaries which are described in greater detail in Health Care Facilities) and several Institutes: Cancer, Ophthalmology, Nutrition, Lung, Child Health, and the Institute Pasteur.

The Nutrition Institute warrants some additional comment. It is a semi-autonomous agency, employing 160 people and occupying a new A.I.D. - financed building. Its budget has been substantially increased and in 1975 it will come entirely from GOT funds.

The Nutrition Institute is linked to other technical ministries by a scientific council on which they are represented. The Institute's research program, with foreign assistance, is well-advanced. It likewise is training dietiticians and beginning a health education effort in the MCH Centers and schools. Its capacity and interest at this time in moving toward a more comprehensive national nutrition strategy will be the subject of a separate review.

All of the Institutes mentioned above treat patients, conduct clinical

research, and provide training. They appear to be little involved in preventive activities or epidemiological research, either directly or in coordination with the Preventive and Social Medicine Division. The Hospital-Sanitary Division is also responsible for overseeing pharmacies and laboratories.

The Preventive and Social Medicine Division has the following functions: campaigns against specific diseases (malaria, trachoma, tuberculosis, schistosomiasis); vaccination, ambulatory treatment and detection of communicable diseases; environmental sanitation including drinking water, campaigns against insects and other pests, sanitary conditions of public places; and school health education. It has about 1,000 employees, almost all with a low level of training, who are supposed to visit every house in their jurisdiction every fifteen days. The Division's principal complaint is shortage of skilled manpower and resources. Only about 8 percent of the total budget of the Ministry of Public Health is devoted to preventive medicine.

Personnel working in preventive medicine operate out of the rural hospitals and dispensaries and in other locations: anti-tuberculosis dispensaries, the 90 MCH Centers, 13 skin disease centers, 12 rabies centers, and 12 border health posts.

Preventive medicine has had some successes, as with malaria control activities, but is receiving little emphasis in comparison with curative medicine. Trained public health physicians are virtually non-existent and it has been difficult to interest young Tunisian physicians in following careers in this field. Health personnel involved in curative medicine have little time for preventive activities, frequently they have slight interest in the field, and their training and bias incline them to curative medicine.

Some interest has been shown in improving the level of preventive medicine and integrating its activities with those of curative medicine. Such integration could provide better general health more efficiently and ease the burden on the curative services.

In an environment in which integration of preventive and curative medicine is not widely accepted, which is directed toward curative specialities, this integration must be brought into being with caution. The basic health services must take on the tasks they can absorb, to which their personnel can adapt, and for which the resources are available. As a first step, the curative services should assume those services which are currently not being performed by the preventive services.

A WHO consultant provided excellent guidelines for the gradual coordination and ultimate integration of services:

1. Formally state the intention of the government to improve preventive medicine.
2. Involve the Institutes in preventive medicine to a greater extent,

provide more regional public health physicians, and improve public health laboratories.

3. Develop occupational health through greater involvement of rural dispensaries.

4. Put the malaria service personnel and sanitary aides under the direction of basic health service physicians.

5. Instruct basic health service physicians to : detect communicable diseases, provide ambulatory treatment, and vaccinate; provide health advice during consultations; and report to the head of the Preventive Medicine Division on their activities. Clearer guidelines and better directions should be established regarding the performance of duties to treat patients at the lowest level in the system.

6. To the extent possible involve hospital-based physicians in preventive medicine activities.

7. Assign residents in the basic health services to a minimum of one year service in preventive medicine. Similarly, assign interns to one year of such services.

8. Revise the course of medical studies to include greater emphasis on preventive medicine and include practical training .

9. Consider the utilization of medical assistants.

The MCH Centers merit particular attention in terms of their potential importance in preventive medicine. These Centers are largely autonomous to the extent that they do not use or work with the basic health services. With nearly 200,000 births per year (25-30 percent of them attended), too much reliance is being placed on pediatricians and gynecologists, when general practitioners, nurses, and midwives in the basic health services could perform the necessary work with the specialists serving as consultants and inspectors. Considerable uncertainty and ambiguity surrounds the use of midwives in these Centers.

With the known unwillingness or inability of pregnant women or mothers with young children to travel long distances for medical services, it is not possible to serve the entire country with 90 MCH Centers, or even with a much larger number centers (a total of 110 are now planned). There are nearly 400 dispensaries which are little used and could greatly augment the services of the MCH Centers. This could be organized in the following fashion:

1. At the village level auxiliary midwives could make examinations and simple deliveries, evacuate complicated cases, and give rudimentary examinations to children.

2. At the dispensary level, both health services and MCH dispensaries,

the women and children can be treated by available professional or auxiliary personnel.

3. At the rural hospitals, deliveries can be made which cannot be provided at the lower levels.

Such use of existing facilities would of course require some additional personnel who would have to be attracted to or especially trained for such service. The use of the rural hospitals could also be expanded to provide family planning assistance.

Although some Tunisian health officials have shown interest in preventive/curative integration the plans which appear to be going forward are putting the greatest emphasis on improving the hospitals at the regional level which will be used to an increasing extent for curative care.

Role of Private Sector

In 1972 there were 104 physicians in full-time private practice, and 158 dividing their time between government and private practice. In the main, private practice is limited to large cities and upper income groups. Aside from individual initiatives in such areas as family planning and some educational work, private physicians have not played a major role in Tunisian health development.

B. Health Care Facilities

Health care facilities under the Tunisian Ministry of Health are structured hierarchically with principal or general hospitals in the main cities, regional hospitals in each medical region, and rural (circonscription) hospitals in the small cities of the governorats. There are also hospitals attached to Institutes or devoted to certain specialities. At the other end of the spectrum are the rural and urban neighborhood dispensaries that provide outpatient care. The size and level of sophistication generally follow this hierarchical structure. Table 12 gives the numbers of hospitals, hospital beds, occupancy rates, and the average duration of stay for the various facilities.

The total number of hospital beds available in 1971 (12,571) provides 2.4 beds per thousand population, or excluding psychiatric hospitals, 2.2 beds per thousand. This compares to ratios of 10.3 in Sweden, 6.8 in the Netherlands, and 5.3 in the United States. The distribution of beds per thousand population varies by governorates with 4.5 and 3.2 in Tunis and Bizerte, respectively; to .66 in Kasserine at the other end of the scale. In all of the other governorates the range is 1.3 to 2.3. Buildings and facilities vary from excellent to poor.

Occupancy rates are high and durations of stay expectedly long in the Institutes and specialized hospitals. Principal and regional hospitals are

at about the 75.4 percent national average occupancy rate and the rural hospitals have a low rate, generally between 40 and 50 percent. The rate of admissions per 1,000 population is 53 versus 145 in Sweden and 110 in France. Other than for the rural hospitals, the relatively high rate of occupancy and low, by developing country standards, rate of admissions would indicate a shortage of capacity rather than demand. However, efficient allocation of scarce health resources would require evaluation of reduction of demand by a stronger preventive medicine program against satisfaction of demand for curative medicine.

The low level of use of the rural hospitals, which will be treated more extensively in a later section, appears to involve a complex of factors: patients avoiding their use in favor of regional hospitals, multiple visits required, the difficulties of time and distance involved in reaching them, and the attitudes of people of the area toward the services available. Part of this problem of low utilization could be alleviated if the role of the hospitals and levels of care to be provided were better defined and screening by lower level personnel and a referral system was instituted. It has been suggested that these rural hospitals be individually evaluated to determine whether they should be improved or whether it would be more efficient to reduce their status to dispensaries for outpatient care.

The hospital network provides an estimated 7 million consultations and ambulatory care services per year. Rural and neighborhood outpatient dispensaries provide an additional 2.5 million consultations and 7 million ambulatory care services. These rural and neighborhood dispensaries, of which there are 388 spread throughout the country, are staffed by nurses or nurses-aides who work under the supervision of physicians who may be on duty only in one or more dispensaries or who may be attached to a rural hospital and visit dispensaries on a part-time basis. These dispensaries are the point of contact where attitudes are formed for much of the population, particularly the rural population, toward the health system. It is through them that many patients are referred up the chain to the rural or regional hospitals.

The dispensaries have some of the same problems as the hospitals in a more acute form. They are ill-kept, short of personnel, drugs and medicines, and frequently even the modest level of supplies and equipment they are supposed to have are not available. The personnel staffing them are unable or not permitted to provide care. The case load is frequently at impossible levels (perhaps 180-200 consultations in a morning) due to lack of screening and it is aggravated by the fact that, as one observer puts it, "... more than 50 percent of the people who come are not really sick. The dispensary provides an opportunity for many women to meet their friends."

In addition to the health facilities previously cited, there are Maternal and Child Health Centers associated with the national family planning program. There are 90 of these Centers with considerable inequalities in

terms of their geographic distribution. For the year 1971 the following data were available concerning their consultation case loads: prenatal, 53,563; postnatal, 5,691; infants (age 0-1), 313,160; children (1-6), 446,995. The numbers do not represent the total number of children receiving care, but rather, the number of consultations, i.e., the same child may be seen on several occasions. Of the number of infant consultations shown, about 94,000 were first time patients of the Centers.

With about 192,000 births in 1971 it appears that less than 30 percent of the mothers received prenatal examinations, and only about 3 percent postnatal examinations, in the MCH Centers. Other data provided show a range of prenatal examinations of one for each two or three births in six gouvernorats with considerably lower rates down to one in 34 births in Kasserine. Clearly there are other possible facilities for the use of pregnant women, mothers, and children, but the data indicate that the MCH Centers are not being well utilized. Part of the explanation lies in the official interest in child care to the exclusion of maternal care.

There are specialized research laboratory facilities available, all of them located in Tunis. The Pasteur Institute conducts studies in serology and immunology, provides some support to the public health services in medical diagnoses, and produces some serums, vaccines, and anti-venoms. The Arloing Institute does research and diagnostic investigations on animal diseases, produces some veterinary biologicals, and inspects food and animals. The Ophthalmology Institute Laboratory conducts research on trachoma and other communicable eye diseases.

The Ministry of Health has been interested for several years in a National Health Laboratory Services project with the assistance of the UNDP and WHO. The project has been put aside but was reactivated when it became part of overall UNDP country programming. The project was approved in early 1974 and is to be completed by 1979. Plans call for improvement or development of laboratories in Sousse, Sfax, Gabes, and Le Kef. When completed it is expected to provide a scientific basis for the control of major diseases prevalent in Tunisia, particularly communicable diseases, environmental health hazards, and other public health problems through laboratory personnel, and control and standardization of drugs and biologicals. The need for strengthening laboratory services and personnel has regularly been mentioned by Tunisian delegates to the World Health Assembly and has been supported by studies of WHO consultants.

C. Health Manpower

Physicians. In 1973, there were 846 physicians in Tunisia. Of this number, 405 were Tunisians and 441 foreigners. This gives a physician/population ratio of 1 to 6,335 when all physicians are considered, or 1 to 13,000 when only Tunisian nationals are taken into account. Foreigners (mainly from Eastern Europe) are hired on a contract basis and are generally assigned to outlying areas.

In addition to their relative scarcity, the Tunisian physician distribution follows the familiar pattern of being concentrated in the cities. The two governorats of Tunis are relatively well served with a ratio of 1/2,529; the less developed west and south, e.g., Beja, Kairouan and Kasserine, show much poorer coverage, with the latter governorat's ratio of 1/23,090. For the poor, who make up the great bulk of the population, the inequitable distribution of physicians is probably somewhat less favorable in the cities than the figures would indicate. A larger percentage of those available in the more populous areas are in private practice and thus beyond the financial reach of the bulk of the population. It can be assumed that a number of those who are in the public sector are engaged in administrative, teaching, or other duties which remove them from active practice to a considerable extent. Table 13 provides a breakdown of numbers, locations, and mode of activity of the available physicians.

Prior to 1964, medical training was not available in Tunisia and all physicians had to be trained abroad. In 1964, the Medical Faculty of the University of Tunis admitted the first class of 59 students to its five-year program of study, and graduated 24 in 1969. Medical school is followed by two years of internship. In 1971, an estimated 350 Tunisians were studying medicine abroad. Estimates of Tunisian physicians living abroad, mainly in France, vary from 200 to 400.

Admission to the Faculty of Medicine was expanded to an average of about 330 first-year students in the early 1970's. This is the maximum it can absorb. The percentage of entrants who graduate has remained relatively low; about one-third, compared with 95 percent of first-year students who graduate from U.S. medical schools. This significant difference probably reflects the continental approach which uses a more lenient admissions policy but equally rigorous training and examinations, thus eliminating a larger percentage of students before graduation.

The Government hopes to increase the number of Tunisian physicians to a 1/4,000 ratio in 1981 and 1/2,000 in 1990 (compared to a U.S. ratio of 1/650). Training is also to be increasingly directed to meet Tunisian needs for more general practitioners and less emphasis on specialities with the exception of general surgery, gynecology, and pediatrics.

To meet this ambitious goal will require about 150 new physicians each year, compared to the 66 who graduated in 1974. Of course, assuming a continuation of the ratio of one-third graduates to entrants, the size of graduating classes in the late 1970's will be considerably larger, although not sufficient to meet the goal. The government's response to this problem has been to create a new medical school at Sousse and Sfax with entering classes of 120-150 first-year students in 1974 at each location. The faculty is bolstered by French professors who spend 3-4 weeks three times a year to give classes several hours per day in their specialty during their stay. As a means of drawing students who will more likely practice outside of Tunis, the schools give preference to applicants from their respective regions. As time goes on and there are four classes of students in attendance, these ad hoc measures will have to be supplemented by more permanent faculty members.

Both cities have hospitals which could, in terms of size at least, serve as a teaching hospital. However, a considerable number of changes and improvements would be necessary before they would be satisfactory for that purpose. As a means of addressing this problem, as well as other concerns such as the medical care needs of tourists, the government proposes constructing a research/teaching hospital at Monastir (20 kms from Sousse) with facilities for neurosurgery, heart surgery, intensive care, etc. A team from the Hope Foundation is now consulting with the Tunisian Government on this project.

Para-Medical Personnel

National legislation and health plans call for between 0.45 and 0.57 non-physician "care" personnel for each hospital bed. The actual number available is currently estimated at 0.24/bed. Although the nursing profession does attract some students, there are limited funds to provide them positions after training. The profession is handicapped by lack of prestige, low pay, lack of substantive duties, and the indifference of the medical profession and the bureaucracy. Data available through 1972 shows that there were 1,303 nurses, 509 public health hygienists, and 3,472 nurses aides. Specialized nurses are in very short supply. Midwives are in critically short supply. For example, the midwife/population ratio is currently 1/132,000 in Medenine. In the seven governorats in which the ratio is less than 1/50,000, less than 20 percent of deliveries take place in health facilities.

No precise data are available on supervisory personnel. There is one "Surveillant General" in each region, promoted for reasons of seniority to higher responsibilities, but most of his duties are not concerned with promoting nursing techniques.

Ten supervisory midwives have been assigned to the regions after one year training in Tunis or at the Rennes School of Public Health in France, but so far, their exact role and prerogatives are uncertain.

Para-Medical Training

WHO's Fifth Report of the World Health Situation provides the following information on the training of nurses and technicians in Tunisia :

	<u>Nurses</u>	<u>Midwives</u>	<u>Laboratory Technicians</u>
Admission requirements	5 years secondary education	7 years secondary education	5 years secondary education
Duration of study	2 years	3 years	2 years
Number of schools	4 public	3 public	1 public
Students 1971/72	316	31	28
Graduates 1972	271	31	23

Tunisia has 9 government operated schools to train nurses, midwives, nurses aides, and male rural hygienists. These schools are located in areas throughout Tunisia : Tunis, Sousse, Sfax, Kairouan, Nabeul, Menzel Bourguiba, Gabes, Gafsa, and Le Kef.

The three midwifery programs are in the Avicennes School in Tunis, and in Sfax and Sousse. The latter two schools started their program in the Fall of 1970 and 1971 respectively.

In September 1974, three nurses aide schools changed their program to that of nursing by increasing the admission requirements from three years of secondary education to five years, and three other schools dropped the nurses aide programs. The nurses aide programs of Kairouan and Gafsa continue as before.

The Nabeul training school for rural health workers has changed since its opening in 1961 from the training of an auxiliary type of community sanitarian to that of a rural hygienist with more and varied responsibilities. These include work in vaccination, tuberculosis, malaria, and general education programs. To date, the School has over 500 graduates.

In addition, the Nabeul School has a two year post basic program in supervision for its graduates. In 1973, a total of 20 were graduated and 17 are to graduate in 1975. There is no assurance that the program will continue beyond the summer of 1975. At that time, the ratio of supervisors per hygienist will be about 1.12

The eight nurse and nurse aide schools together produce 400 graduates yearly, and the number is increasing. In a few years, the numbers of this category of personnel should suffice to meet job demands. (The estimated number of graduates from 1960 to 1974 is 5,500.) Conversely, the three schools of midwifery produced only 53 midwives in 1974. This is significant, since the number of midwives working in the Ministry of Health, including the new graduates, is a little over 200. This is far from meeting the demand which has been estimated at about 600.

The curriculum of all the schools mentioned and all programs are approved by the Ministry of Health which assures a degree of uniformity. The teaching is hospital and sick care oriented. Further, a large proportion of the lectures are given by physicians and are medically, non-psychologically and non-task oriented. Generally, there is a monitor for each class, and the number of students for each class ranges from 25 to 40.

The first post-basic program for training instructors was offered at the Avicenne School in 1964 with assistance from WHO. By the end of 1972, 60 nurse instructors and 3 midwife instructors had graduated. These graduates now form, in part, the teaching staff for the three schools of midwifery and the 5 schools of nursing. In view of a combined enrollment of 1,600 or more students (1972), the number of instructor is too low to adequately supervise and to teach students in the clinical areas.

In 1972, a new post-basic program in supervision for midwives was started and 12 graduated. Also in the same year, one midwife and two nurses graduated as instructors. In the Fall of 1973, the post-basic program for training instructors and supervisors came to an abrupt end. Thus, the gains which were made between 1964 and mid-1973 toward the improvement of nursing and midwifery education and service programs were halted. Consequently, levels of paramedical services are not likely to improve at a time when this will be most needed since the number of health facilities and the demand for services will increase significantly. The GOT may continue to train an increasing number of nurses and midwives for basic staff positions, but the quality of the training and the delivery of most services will improve very little.

Midwifery is a women's profession in Tunisia and nursing is becoming increasingly so. However, the status and financial remuneration given to these occupations, although higher for midwives than nurses is low. Furthermore, there is a great hesitancy on the part of physicians and other officials to delegate to this group of workers the responsibility and authority they should have in a modern health system.

The necessary remedial action would include:

1. Establishing a program in post-basic education for nurses and midwives to include teacher training and supervision.
2. Increasing the two year program in nursing to three years with the last year devoted to public health and preventive services.
3. Broadening the role of the school at Nabeul to make it a Community Health College and Training Center which would include programs for health officers (non-MDs), midwives, nurses, sanitarians, etc.
4. Developing and distributing programmed instruction material for all nurse and midwifery programs.
5. Establishing within the Ministry of Health a Division of Midwifery and Nursing.
6. Encouraging professional associations for midwives and nurses.
7. Establishing official policies defining and authorizing expanded responsibilities for nurses and midwives.

One other possible means of improving the number of health personnel available for preventive medicine and delivery of services would be training medical assistants. Such personnel have functioned very effectively, under appropriate supervision, in the U.S. Although differing opinions are heard concerning the acceptability of this idea, it does not appear to have widespread support in Tunisia.

Tunisian officials give the clear impression that "health manpower" means physicians with little leeway for the use of auxiliaries or nurses. Further, the foreign assistance now chiefly desired in the health sector is the provision of medical personnel particularly for operational assignments in rural and under-served areas. Consideration is being given to providing hardship bonuses to Tunisians willing to serve in these areas as well as a requirement for medical graduates to accept such duty. There seems to be little likelihood, however, that foreign medical personnel can be replaced by Tunisians in the near future, to say nothing of replicating most health services delivery pilot projects of the kind now conducted by foreigners.

Tendencies. It is difficult to prescribe definite numbers of paramedicals for a country, either per inhabitant, per bed, or per physician. The medical care philosophy which prevails determines numbers needed as well as relations between the types of personnel.

In a country where non-physician personnel work closely with physicians, the number needed may vary from 5 to 10 per physician. In this situation, the physician sees all patients, no matter how superficial his examination may be, and non-physicians are used as helpers closely super-

vised by the physician. This method is wasteful and prevents development of a more effective division of labor in the provision of health care. In countries where non-physician personnel are given broad but well defined responsibilities, a more efficient structure can be built, using fewer doctors and more non-physician personnel.

Tunisia is by tradition a country of the first type. Consequently in contrast to some other countries, her non-physician personnel are few, with poor motivation and organization, and with limited career expectations. The policy with regard to functions and utilization, however has been maintained only in the cities where there are physicians to oppose the delegation of more responsibilities to non-physicians. In the countryside, as requirements for service increase without commensurate addition of Tunisian physicians, additional functions have been given to non-physicians, particularly midwives and nurse-sanitarians. This development has not been accompanied by a legal definition of responsibilities, written instructions, or the appropriate training. In view of the fact that most countries now give more prerogatives and authority to non-physician personnel, Tunisia will surely move in the same direction. Eventually, therefore, it will be necessary to establish a public health policy which would create the necessary legal, institutional and educational structures for better use of personnel. Such a move would also give the effect of further increasing the role of women in Tunisian society.

D. Utilization of Health Services

As a general rule the underdeveloped countries are at a disadvantage in comparison with the developed countries in terms of the availability of health resources, the distribution of these resources, especially with regard to rural areas, and the inhibitions frequently shown by rural or traditional people in using the services that are available. In view of these factors a review of the availability of services must consider their spread and the way in which they are utilized. Utilization rates involve a complex of factors; health status, the propensity to seek care, the cost, accessibility and acceptance of facilities, and a variety of economic, social, and cultural factors.

A significant study of the use of health services in Tunisia has been made by WHO which, unlike studies which examine the users or the services, considers both the health services themselves and the population. The Governorate of Nabeul was chosen as a representative site for the study. Although somewhat above average in terms of income and resources, the area has many of the characteristics of the country at large with small cities, farm areas, vineyards, isolated villages, and a virtually inaccessible mountainous area.

Health services of the region show the hierarchical structure typical of the country. These include a regional hospital in the provincial capital, auxiliary hospitals in market town with populations of about 10,000, dispensaries in smaller towns and the larger villages, and rural dispensaries in the outlying areas.

The study was able to consider both the general population and the health facilities by linking members of the population through their numbered identity cards and their correspondingly numbered health records. To do this, seven sample areas of various facilities were chosen to obtain a range of conditions and attitudes. Of the 13,513 residences in the chosen areas, 2,489 urban and 1,319 rural people were interviewed.

Questionnaires were carefully drawn to determine: health care or Social Security identification data; the felt need for treatment and the use of available services; attitudes toward and satisfaction with the health care provided, health personnel, and facilities; degree of self treatment and use of folk medicine; and family socio-economic data.

The information provided in response to health related questions in the interviews was supplemented and verified by use of the medical records available at health services. It is interesting to note that nearly 80 percent of the families interviewed held registration cards entitling them to use the health services with no significant difference between the proportion of rural and urban families. This corresponds with the level of coverage estimated by Tunisian public health officials.

Among the sample group that had used the health services at one time or another in the five-year period 1964-68, the results showed that there were 92.7 visits per 100 rural people and 156.4 visits per 100 urban people. Due to the fact that coverage of both urban and rural population was about the same, i.e., services were equally available in rural areas, albeit services of a less extensive and sophisticated nature, it was concluded that other factors are at work which result in a lower level of use by the rural population. More detailed data show that this difference applies for almost all age and sex groupings.

There were other interesting findings developed by this study. In all of the areas, both urban and rural, about 85 percent of the users visited the health services only once for each diagnostic episode. Only 8 percent made more than three visits for the same diagnostic episode. There was virtually no urban/rural variation in this pattern. There was, however, considerable difference in number of episodes per year for which the services were used. This does not necessarily indicate that the health of urban people is poorer than those in rural areas, but rather that urban dwellers are more frequent users of available services.

The ranking of the conditions diagnosed accords with estimates of their national importance. The data show that nearly one-half of all of the illnesses seen are for respiratory diseases, gastro-intestinal disorders and skin diseases. Most of the conditions diagnosed are acute infectious diseases. The only chronic conditions accounting for more than 1 percent of visits were tuberculosis, rheumatism, and syphilis. Bronchopneumonia, diabetes, and heart disease, as well as surgical problems are seldom encountered in these facilities. Considering the nutritional status of the population, there are very few visits for that problem. Gynecological problems and childhood diseases are also very limited but perhaps this can be explained in part by use of maternal and child health care centers. The general impression left by this data is that the health services are primarily used for relief in connection with relatively common illnesses and the service is used only once for the particular illness. Although there are some urban/rural differences in the incidence of the various diagnoses, these differences are minor.

Reviewing the data developed on several bases provided useful profiles of the characteristics of "high" and "low" use households.

1. Urban dwellers were high users with over twice the frequency of rural people.
2. In terms of "modernity" the urban group scored significantly higher than the rural, but the rural literate used the services twice as frequently as the illiterate.
3. Urban or rural persons who used the services most had good rapport with health personnel, believed staffs were adequate, and did not believe the waiting time was excessive.

It can be concluded from this study that for the population sampled, in addition to a mental set which predisposes use of facilities for a perceived need, the services are most used if the population believes it receives reasonable care from approachable, competent personnel working in adequate facilities and without a long waiting or traveling time involved.

III. HEALTH POLICIES AND PLANS

A. Fourth Plan for Economic and Social Development, Health, 1973-76

The Plan sees the principal gains during the last ten years as due to the improvement of preventive medicine and the general improvement of the state of public health. This has resulted in a reduction of the incidence of disease and resultant decrease in mortality. Favorable results have been largely due to the training of more health personnel and extension of health services.

In spite of gains, the demands for health care are increasing and funds are always insufficient to meet them. For instance, the number of hospital beds per population is insufficient (1 per 400 persons) and the spread of these facilities is inequitable. Activities under the Fourth Plan will require a balance between budgetary constraints and the needs of the public for health care.

During the previous ten years 1962-71, capital investments in the health sector were just over 10 million dinars, or about one million dinars per year. This amount was scarcely enough to maintain existing buildings and equipment. During the four years of the new Plan, it is expected that nearly 26 million dinars will be devoted to capital investment with the expectation that the facilities to be provided will ultimately cost twice this amount but the balance will be borne in the next four year period. This sum will be supplemented by projected operational funds rising from 16.2 million dinars in 1972 to 24 million dinars in 1976.

The main lines of preventive action proposed for the Fourth Plan period are:

1. Strengthening preventive medicine activities to consolidate and improve upon the gains made against endemic disease, particularly tuberculosis, respiratory diseases, gastro-intestinal infections, eye and skin diseases, venereal disease, and malnutrition.
2. Improvement of environmental sanitation, particularly in rural areas.
3. Promoting awareness in the population of the connection between health and family welfare and the need for restrained population growth.
4. A greater number of ambulatory care centers, particularly in the rural areas.

To better improve the delivery of curative health care, the Plan calls for improving the equipment and physical plant of hospitals in Tunis, Sousse, and Sfax in accordance with their status as teaching hospitals and to receive referrals from lower level facilities as well as for the development of health personnel. Four new regional hospitals are to be built starting the last year of the quadrennium (Jendouba, Medenine, Gabes, Mahdia).

A basic consideration in improving the state of public health and meeting the goals of the Plan is the development of health manpower. Special attention is to be directed toward diverting medical education from traditional training toward a greater focus on preparation of physicians who are well adapted to the problems they will encounter in Tunisian practice. This would include more persons prepared for general practice and fewer directed toward medical specialities.

The quantitative objectives are to raise the physician/population ratio from 1/6,400 in 1972 to at least 1/4,000 in 1980 and 1/2,000 in 1990. This will require turning out 150 physicians per year. This goal cannot be met in the current quadrennium; only about 280 will be produced during this period. Plans to expand the University of Tunis Faculty of Medicine have since been superceded by the opening of medical schools at Sousse and Sfax.

The proposed capital investment of 26 million dinars will also be used to provide some funds for centers of preventive medicine and occupational health as well as to expand family planning services by construction of three urban maternity centers and 29 maternal and child health centers. For general ambulatory care, it will be necessary to construct 100 dispensaries in rural areas as well as improvement and modernization of regional and local hospitals. In spite of increased operational funds proposed of 24 million dinars in 1976 compared with 16.2 million dinars in 1972, the Plan calls for greater assistance from the public sector and other governmental agencies, e.g., the Social Security system which is called upon to develop its own facilities and thereby lessen the burden on the public system for provision of health services. The Plan also looks for greater participation by multilateral, international and bilateral assistance.

Resource Shortfalls

This assessment has not attempted to determine in depth capital investment needs in the health sector. It would appear, however, with the IBRD/IDA maternity hospital and MCH project, the A.I.D. renovation funds for family planning facilities, and the development of university hospitals in Sousse and Sfax, that the most important remaining need will be to expand and improve non-physician training and use. Effective non-physician service will be more critical to improved public health than increasing the number of hospital beds. This includes their use in upgrading preventive health, and in re-organized emergency, laboratory, X-ray and records departments, and a change in duty schedules to provide 24-hour service.

B. Health Planning and Research

Tunisian officials point out that health planning has only a modest part in the development of the overall Economic and Social Development Plan but it is making some headway. Previously, the funds available for the Ministry of Health were allocated in a block with a certain percentage increase over the previous year. It has since been recognized that if political decisions are made for capital projects in the health field, funds must be allocated to meet them. Thus the budget is now provided in terms of capital and current expenditures.

In terms of the rate of increase in the budget, the health sector has fared reasonably well over the last few years. The increase in the current budget in 1973 over 1972 was 17.5 percent and the health portion of the total current budget was 8.8 percent. As previously cited, proposed capital expenditures for the 1972-76 period are to be 26 million dinars (with an equal amount to be spent in succeeding years to complete these projects) compared with 10 million for the period 1962-71. About sixty-six percent of current expenditures are for costs of personnel, twenty-five percent for supplies, and nine percent for administrative and other expenses. About 8 percent of the current budget is devoted to preventive medicine but it is pointed out that some preventive activities are carried out in various curative functions.

There is a concerted effort in the Ministry of Health to encourage the Social Security system, which covers workers in establishments of over 20 employees, to develop its own health facilities. The Ministry does not believe this group pays its way under the present system. Also if the estimated one million people involved were not provided care by the Ministry, there would be an obviously reduced demand on MOH facilities.

The current capital budget and conversations at the MOH give a reasonable indication of the direction that the health sector will take over the near term at least. The decision has been made to increase the supply of medical manpower by opening the new medical faculties at Sousse and Sfax. At the same time, substantial capital expenditures are proposed for upgrading hospital facilities at Tunis, Sousse and Sfax. The budget also calls for new regional hospitals at Jendouba, Medenine, Gabes and Mahdia of 200-300 beds each to be constructed toward the end of the Plan period. The proposal is to upgrade and expand university and regional hospitals, and, recognizing the apparent attitudes of the public toward the quality of care (as described in the section on Utilization of Health Services) and the lack of personnel available, the rural hospitals are to be de-emphasized. Government plans are to transport patients requiring hospital services to the regional hospitals to an increasing extent. This is considered feasible through means of a reasonably good road network and a capital expenditure over the Plan period of 1.15 million dinars for vehicles of all types and two airplanes.

It does not appear that this decision to emphasize doctor delivered curative services in hospitals was made through any extensive assessment of the overall health sector or of the most cost effective means of delivering health services through varying means. To the contrary, high level political decisions which likely involved various interests, existing administrative structures, and well meant concern for the people to be served, led to the decisions. Some cost-effectiveness studies were made regarding areas to be served by transportation and other aspects of this policy but basic decisions came from the top rather than evolving from detailed reviews and recommendations by public health professionals.

One of the significant felt needs in national health planning is the lack of good data and documentation to support such efforts. It is recognized that in general the health planning activities will be directed at a sub-optimal level, i.e., the determination of the most cost-effective means of

realizing previously assigned objectives, without regard for whether the objectives themselves are the most appropriate.

The Planning Office of the Ministry of Health has expressed an interest in a health sector assessment but is uncertain that it has the personnel or resources for such an extensive undertaking. It would also be a consideration that the Ministry is embarked upon a program to emphasize medical education and physician directed curative services at regional hospitals. This apparently firm direction might place a ceiling on the benefits to be gained from such a sector assessment.

An interesting research project in the integration of MCH/Family Planning and the basic health services is now being initiated. The project is to be carried out under a DHEW/HSA contract with WHO, using PL 480 Special Foreign Currency funds of about 350,000 dinars. The study will try to determine in a pilot area the best means of using the limited resources of existing health services and combining them with MCH/Family Planning services to provide a balanced program. The project will also have a training and education component.

IV. SUMMARY OF PRINCIPAL PROBLEM AREAS AND CONSTRAINTS IN THE HEALTH SECTOR

Although the health status of the population has improved considerably over the last generation, a number of problem areas remain to be overcome if Tunisians are to enjoy a high standard of health. A brief summary of these follows:

1. There is a high level of infant and childhood mortality with children under 5 years of age accounting for nearly one-half of all reported deaths. This level of mortality is brought about by a complex of economic, social and environmental factors including communicable diseases, sanitation, nutrition of children and mothers, and health care availability.

2. Although the incidence of a number of formerly important communicable diseases has been greatly reduced, they remain a threat of significant proportion. While such diseases as smallpox, typhoid and diphtheria have been greatly reduced, others such as tuberculosis, gastro-intestinal and parasite infections are equally susceptible to preventive measures including immunization, sanitation, and nutritional programs.

3. Environmental sanitation, closely connected with the foregoing health problems, is at a low level, particularly in the outlying areas. There is a shortage of trained personnel, health education, and support for environmental improvements particularly where they are needed most - in the non-metropolitan areas.

4. Population growth is recognized as a problem area by the Tunisian government and family planning has broad official support. Nevertheless, the number of women who have adopted family planning methods is small in relation to the married population of child bearing age. The major difficulties encountered among the public are apprehension of the unknowns of family planning,

poor treatment at often uninviting centers and pronatalist tendencies especially favoring male children.

The new 1974-1977 Program for Family Planning should provide a basis for a more effective development of the national program. Its targets are ambitious but may be feasible in the light of performance since 1972. The most important question is whether the extensive training activities proposed will in fact be sufficient to upgrade the quality of service actually given patients. A second question is whether educational activities of sufficient quality can be developed to directly touch the mass of prospective acceptors.

5. Undernutrition and malnutrition represent serious problems to large numbers of the population, particularly infants, small children, and pregnant and lactating mothers. Feeding programs have made a substantial contribution particularly to the nutritional status of children but low caloric intake, insufficient high grade protein, and lack of vitamins and minerals are very prevalent. A major bottleneck to better nutrition status is the lack of coordination between programs in family planning, MCH, agriculture and nutrition.

6. The health system is not structured to operate in the most effective manner. It is short of physicians at high and mid-levels, does not have enough high level career officials that can continue functioning efficiently through political changes, and in large measure, it operates vertically with little horizontal integration of activities. This latter point is particularly important with regard to the separated curative and preventive services.

7. There is a shortage of physicians and other health manpower and they are congregated in the cities to a great extent. Many of the physicians that are in outlying areas are foreigners in the country on time limited contracts. Specialization is overstressed in foreigners and Tunisians.

8. Medical education has been greatly expanded by the opening of two additional medical schools at Sousse and Sfax. The curriculum is apparently being revised to provide more training in public health and be more directed toward the problems of the Tunisian environment. The medical schools and the teaching hospitals associated with them will require a considerable increment of faculty, equipment, and nursing staff if they are to function effectively.

9. Para-medical personnel are neither trained nor used at an optimum level. In comparison with more developed health structures, they are underutilized, poorly paid, poorly supervised, and given limited responsibilities. Para-medical schools neglect the training of instructors and supervisors, and themselves suffer from shortages of teachers and practical training facilities. In sum, the use of para-medical personnel has not been integrated into a well thought-out public health planning philosophy.

10. Hospitals, like health manpower, are not equitably spread through the country. The rural hospitals are poorly equipped and staffed and have low utilization rates. There is little regulation of what physicians should or should not treat in a given hospital below the general level. The Tunisian response to the poor spread of curative facilities is to concentrate funds on the university associated hospitals with the intention of extending the amount of patient transportation service to the regional hospitals. This concentrates more facilities in urban areas and stresses curative procedures.

11. There is a great interest in obtaining foreign physicians to provide health services in rural areas with little possibility that the services can be continued, to say nothing of replicated, when the foreigner's tour of duty ends.

12. The MCH Centers are little used for pre and post natal services. The services are almost totally directed to children. Opportunities for health education, or family planning counselling could be offered to waiting mothers. There is no screening procedure so much professional time is wasted. Recent initiatives in the Office of Family Planning are seeking to address some of these questions. A ministerial MCH, family planning and nutrition committee has been announced and pilot educational efforts are underway.

13. Low use of outlying facilities is in part due to poor scheduling, long waits, repeat visits, and poor rapport with doctors.

14. Health planning is seriously hampered by lack of a data base. There is not a clear relation between inputs and proposed outputs. Planning appears to be relegated to reviews of implementation after major policy decisions have been made. A thorough sector assessment could provide valuable understanding of the sector which might influence future health decisions.

V. ROLE OF FOREIGN ASSISTANCE

A. Current Assistance from International Organizations and Non-U.S. Donors

Tunisia receives a substantial level of assistance from international organizations and foreign donors. Most of the assistance provided is actually the contracting of foreign medical personnel to provide services. It is in this area where assistance is most frequently requested: health manpower, most particularly physicians, to go to outlying regions to deliver services. Some 300 foreign physicians now work in Tunisia under various forms of sponsorship. Unfortunately, the Tunisian manpower is not available to assume these duties when the foreigners depart. Financial support, particularly without advice on how to use funds, is acceptable. Advisors and study groups are not particularly welcomed. In the Tunisian view, financing and advisors are not their major problems; medical manpower is of primary importance. Table 14 provides a comprehensive listing, by program areas, of assistance provided through international organizations and non-U.S. foreign donors.

Family Planning has received extensive assistance. The IBRD has provided about \$4.8 million through an IDA credit for support of MCH and population programs. Other donors have included the Ford Foundation, the WHO, the Population Council, the International Planned Parenthood Federation, the Swedish International Development Agency, the Dutch International Development Agency, and the German Family Planning Association. Most recently, the UNFPA agreed to provide \$4,000,000 in assistance either directly or through the specialized agencies in the period running from 1974 to early 1978.

Several international and bilateral sources have contributed to the development of environmental sanitation, particularly water supplies, in Tunisia. The UNDP has worked through WHO to help the Ministry of Health create an environmental health service within the Ministry and the establishment of a national sanitation program. This Environmental Health Service has been developed to supervise regional sanitation programs and exercise control of hygiene particularly in tourist areas. Thus far, the service has not extended beyond the Ministry itself due to lack of trained staff. The central water supply agency (SONEDE), has recently developed small water control laboratories. Agreement has been reached between WHO and SIDA (Swedish International Development Agency) on a National Plan for Waste Water Treatment and Disposal. Another department in which environmental sanitation has been developed is in the Regional Labor Scheme which has been allocated approximately \$1 million for construction of wells and improvement of solid waste disposal, particularly in the rural areas.

Tunisia has received assistance from a variety of sources for developing health manpower. Since 1961 WHO has provided professors on a full-time basis and periodic consultants to the medical school and other institutions, and assistance to nursing education since 1964. UNDP has provided fellowships in cooperation with WHO. The Population Council, the Ford Foundation, and other voluntary organizations have also provided fellowships. Other bilateral assistance has been provided by France, Italy, the FRG, Belgium and the Netherlands.

Nutrition assistance has been provided by France mainly in the form of training courses, advisors and teachers. The Swedish Government, UNICEF, and the Tunisian Government are building a factory for the production of a high protein weaning food (Saha) which is similar to the Superamine produced in Algeria. Sweden is providing about \$860,000 and the Tunisians slightly more. After production begins in mid 1975 it is expected that Saha will be distributed free in MCH Centers and educational institutions and sold at subsidized prices through commercial outlets.

At the present time there are no nutrition programs provided by WHO. The UNDP, with FAO as the executing agency, is providing a modest level of support for the National Institute of Nutrition. UNDP/FAO are also providing assistance in eleven nutrition related projects in agriculture and fisheries improvement about half of which are scheduled for completion in 1974. Contributions of funds, commodities, and services from other donors have been important to the nutrition sector. The combined contributions from UNICEF, WHO, FAO, Canada, West Germany and Belgium amounted to approximately \$160,000. All of these assistance programs have been directed toward strengthening the basic institutional foundation of the Nutrition Institute instead of addressing specific problem areas and constraints identified in Section IV.

B. U.S. Assistance

USAID has played an important role in providing better nutrition to various groups in the population through PL 480 foodstuffs. The "food for work" program which began in 1958 and continued until mid 1973 was the first of its kind in the world. Under the program AID provided wheat which was locally milled and distributed to previously unemployed laborers. The Tunisian Government provided a supplemental cash wage in return for labor by the workers on various development projects. The program thus had the dual purpose of providing useful employment and improving the nutrition of about 70,000 workers per year and several times that many dependents. Over 1 million tons of wheat were provided under this program.

Child feeding assistance has been provided by PL 480 Title II commodities for child feeding programs in schools and through maternal and child health centers for children and pregnant and lactating mothers. In the MCH program, AID is now working in cooperation with CARE/MEDICO, Catholic Relief Services, and the Tunisian Government in a new project to train MCH personnel in nutrition education and to evaluate the use of the MCH centers as a means of delivery of food commodities. The pre-school feeding program for children age 3-6 reaches about 180,000 children through nearly 500 centers, particularly in small towns and rural areas. The principal foods provided under this program are flour, blended foods, and oil. The largest child feeding program is a primary school lunch program which now reaches about 300,000 needy children age 6-12, about one-third of the total enrollment. This program is also conducted in cooperation with CARE, CRS, and the Tunisian Government. The program was reduced in size in 1974, re-directed to focus on the rural poor, and the nutritional content improved. It is expected that the Tunisians will gradually assume the school feeding program and U.S. assistance will be phased out. For 1974 about 34.5 million pounds of food was provided under Title II at a cost of \$3.35 million.

Tunisian Government nutrition activities were originally spread over the Ministries of Health, Social Affairs, Education, Agriculture and Planning. To provide more coherent nutrition activities and planning, the National Institute of Nutrition and Food Technology was established in 1969 with USAID assistance to centralize these functions. The Institute's divisions include Applied Human Nutrition, Food Science and Technology, Food Planning and Economics and Nutrition Education. U.S. assistance provided a headquarters building and initially covered 75 percent of the operating budget, but the Tunisian Government will complete assumption of costs by 1975. Equipment and participant training has also been furnished by USAID.

One of the priority activities of the Nutrition Institute is a National Nutrition Survey to make a more precise determination of the nutritional status of the population and thereby better define existing malnutrition and undernutrition problems, identify regional food availability in order to mesh agricultural production with needs, and to identify means of solving national nutritional problems with national resources. Another important activity of the Institute is a lysine fortification project in southern Tunisia being conducted with the assistance of AID and Harvard University. The purpose is to test the nutritional benefits of lysine fortification of wheat on the local population, the possibility of lysine manufacturing in Tunisia, and the economic aspects of such a fortification project.

Family Planning has received about \$7,000,000 in U.S. assistance to date. This includes \$2,000,000 for the renovation and upgrading of MCH and other family planning facilities, \$1,000,000 toward local costs of the IBRD/IDA hospital and MCH construction project, operating expense contributions, participant training, equipment and contraceptives, and an advisory team of public health/family planning specialists.

The project has been designed to assist the GOT on a wide range of problems, with emphasis on supply management, organization of medical and clinical services, training of para-medical personnel, and the development of educational and promotional activities.

Private voluntary agencies have provided substantial assistance in addition to the CARE/MEDICO and CRS work referred to above. This includes curative and educational activities of Project Hope, and extensive well improvement and protection and orthopedic services by CARE/MEDICO. Special foreign currency programs, particularly under HEW, have permitted research and some educational work in several important areas such as tuberculosis and trachoma control. Active PL 480 projects in the health field now amount to about \$2,000,000.

The Peace Corps has also provided assistance in the health field including such divergent activities as well construction and protection with CARE/MEDICO, nutrition technicians and nurses.

C. Impact of Current Foreign Assistance on Health Problems and Constraints

1. Infantile and post-infantile mortality are influenced by any effort to improve water supply and nutrition. The personnel of various nations working in MCH centers contribute to this goal. This is also true for assistance in Family Planning, which permits longer breast feeding and better infant care. Emphasis in preschool age nutrition will bring further progress, since it has been shown that age 2 to 3 is most exposed to malnutrition.

2. Vaccination programs have received particularly significant help from UNICEF and this assistance will be very useful for a long time.

3. Environmental Sanitation requires a mixture of precise technical skills at various levels, money, and the development of a sense of community life and responsibility. This has yet to receive major emphasis. Population increase brings increased pollution and increased water and land use. Irrigation will become more extensive, and one can thus expect a rise of water-borne diseases (diarrheas, typhoid fever, schistosomiasis) unless a major effort is made in sanitation, together with a multi-disciplinary Community Development Program.

Environmental sanitation thus appears a promising field for foreign assistance. A pilot area could serve for university teaching and research programs, as well as for demonstrations of nonformal education methods for men and women.

4. Population Growth will have received sizeable assistance by 1978 with completion of that now programmed by the IBRD/IDA, USAID and the UNFPA. The GOT itself has given substantially increased support to this field. Major additional external assistance should be deferred until the present effort can be adequately evaluated.

5. Undernutrition and Malnutrition are assisted by USAID in the Lysine and Nutrition Institute project and by various agricultural activities. With the Swedish/UNICEF SAHA project some of the available knowledge will be put to work. The USAID-financed Nutrition Survey will provide more refined data for a new stage of work. This will involve teaching the use of new foods and in changing dietary habits, and may require more foreign assistance.

Other Problems of the Public Health System

The principal problem is the extreme shortage of trained Public Health Physicians, caused by a lack of proper status and salary. Careers in this field should be made competitive with private practice. USAID has offered fellowships to physicians for Public Health training but there has been so far no response.

The setting up of a faculty of public health within the medical schools of Sousse or Sfax would be an important step in meeting the problem. Such a Public Health faculty could train Public Health physicians and aim at upgrading the training of non-physicians health personnel and help the Tunisian authorities establish the bases for a revolution in health perspectives and priorities.

The felt need for foreign physicians manpower is met by several nations which provide OPEX type MD's.

TABLE 1

DEATHS BY AGE AND SEX, 1969

<u>Age</u>	<u>Males</u>	<u>Rate/ 1,000</u>	<u>Females</u>	<u>Rate/ 1,000</u>	<u>Total</u>	<u>Rate/ 1,000</u>
Under 1	7,903	29.8	7,253	29.4	15,156	29.6
1-4	5,465		5,598		11,063	
5-9	852	2.2	693	1.8	1,545	2.0
10-14	454	1.3	367	1.2	821	1.3
15-19	441	1.7	405	1.7	846	1.7
20-24	312	1.9	358	2.1	670	2.0
25-29	324		386		710	
30-34	372		535		907	
35-39	408		571		979	
40-44	503	5.5	492	5.0	995	5.2
45-49	624		483		1,107	
50-54	788		596		1,384	
55-59	1,355		883		2,238	
60-64	1,526		1,087		2,613	
65-69	1,794	25.9	1,271	21.7	3,065	24.0
70-74	1,427		952		2,379	
75-79	1,159		793		1,952	
80/over	1,811	68.6	1,322	54.2	3,133	61.9
Unknown	<u>721</u>	<u> </u>	<u>588</u>	<u> </u>	<u>1,309</u>	<u> </u>
TOTAL	28,239	11.0	24,533	10.0	58,872	10.5

Source:

United Nations Demographic Yearbook, 1972.
 Bracketed age groups are ^{as} shown in the source.

TABLE 2

RECORDED VACCINATIONS

Cholera	3,350,916*
Smallpox	1,039,342
Poliomyelitis	873,286
BCG	330,868
Tetanus	192,963
Diphtheria	187,854
Whooping Cough	187,156
Typhoid/Paratyphoid	166,138
Yellow Fever	177

* In response to a cholera epidemic.

Source: Fifth Report of the World Health Situation,
WHO, Geneva

TABLE 3

INCIDENCE OF NOTIFIABLE DISEASES1969 - 1970 - 1971

<u>Diseases</u>	<u>Number of Cases</u>			<u>Rate Per 100,000 Inhabitants</u>		
	<u>1969</u>	<u>1970</u>	<u>1971</u>	<u>1969</u>	<u>1970</u>	<u>1971</u>
Tuberculosis	----	1,786	1,979	----	34.8	37.7
Typhoid and Paratyphoid	1,511	1,171	978	30.1	22.8	18.7
Hepatitis	1,033	1,290	1,149	21.0	25.1	21.9
Syphilis	251	1,124	1,034	5.0	21.9	19.7
Meningitis	167	162	403	3.4	3.2	7.7
Dysentery	117	231	219	2.3	4.5	4.2
Hydatic cysts	80	98	92	1.6	1.9	1.7
Poliomyelitis	77	8	101	1.5	0.2	1.9
Diphtheria	57	54	48	1.3	1.1	0.9
Typhus	51	30	47	1.0	0.6	0.9
Tetanus	26	23	48	0.5	0.5	0.9
Leprosy	22	29	32	0.4	0.6	0.6
Rabies	48	14	5	1.0	0.3	0.1
Malaria	467	93	100	9.3	1.8	1.9
Cholera	0	27	0	0.0	0.5	0.0

Source: Ministry of Public Health, Republic of Tunisia

TABLE 4

COMMUNITY WATER SUPPLY
(Population in Thousands)

	<u>1962</u>	<u>Percent of Total</u>	<u>1970</u>	<u>Percent of Total</u>
<u>Urban</u>				
With house connections	820	50	1,200	53
By public standposts	<u>580</u>	<u>35</u>	<u>850</u>	<u>38</u>
Total	1,400	85	2,050	91
<u>Rural</u>				
With reasonable access			500	17
<u>Total Country</u>			2,550	49

TARGETS FOR 1980*

	<u>Popu- lation</u>	<u>Pop. Change from 1970</u>	<u>Cost/ Person (\$)</u>	<u>Total Cost Millions</u>
<u>Urban</u>				
With house connections	2,138	938	32	30.0
By public standposts	<u>1,832</u>	<u>575</u>	11	<u>6.3</u>
Total	3,970	1,513		36.3
<u>Rural</u>				
With easy access	900	400	13	5.2
<u>Total Country</u>	4,870	1,913		41.5

* Targets set were: 60% of urban population with house connections; 40% of urban population with public standposts, and 25% of the rural population with easy access to safe water.

Source: United Nations Demographic Yearbook, 1972.

TABLE 5

SEWAGE DISPOSAL FACILITIES AS OF DECEMBER 21, 1970

(POPULATION IN THOUSANDS)

<u>Urban</u>	<u>Population</u>			<u>Percent of Total</u>
Connected to Public System				
Conventional Treatment	420			
Without Treatment	<u>266</u>			
Total	686			30
Pit privy, septic tank	1,570			70
Total Urban	2,256			100
<u>Rural</u>				
With adequate disposal	984			34
<u>Total Country</u>	3,240			63
<u>Targets for 1980 and Estimated Costs *</u>				
<u>Urban</u>	<u>Pop to be Served</u>	<u>Pop Change from 1970</u>	<u>Cost/ Person (\$)</u>	<u>Total Cost Millions</u>
Connected to public System	1,832	1,146	52	59.6
Household systems	<u>2,138</u>	<u>568</u>	7	<u>4.0</u>
TOTAL	3,970	1,714		63.6
<u>Rural</u>				
With adequate disposal	900		2	
<u>Total Country</u>	4,870	1,714		

*Targets set were: 40% of the urban population connected to the public sewerage system, 60% of the urban population provided with household systems, and 25% of the rural population with adequate disposal. No changes are shown in the services to rural population in the 1980 target because the rural population with adequate disposal in 1970 (34%) already exceeds the 1980 target figure (34%).

Source: United Nations Demographic Yearbook, 1972.

TABLE 6

AMOUNT OF NUTRIENTS PER CAPITA PER DAY IN TUNISIA (URBAN AREAS)

1960

	<u>Group 1</u>	<u>Group 2</u>	<u>Group 3</u>	<u>Average</u>
Caloric Intake	2,280	1,580	1,125	1,568
Protein (Gr.) of which of animal origin	67.50	40	32	42.3
Fats (Gr.)	12	2.26	0.9	4.0
Carbohydrates (Gr.)	61	36	25	37.2
Calcium (Mg.)	363	270	192	260
Iron (Mg.)	254	130	98	146.5
Vitamin B ₁ (mg.)	14	8.3	6.7	8.9
Vitamin B ₂ (mg.)	1.4	0.95	0.78	0.98
Vitamin P-P (mg.)	0.68	0.36	0.34	0.43
Vitamin C (mg.)	1,220	640	496	718
	99	63.5	41	62.5

Source: Un Faubourg de Tunis, Enquete Nutritionnelle et Medicale, Ben Salem, Claudian, Iaieb,
as cited in the Ecology of Malnutrition in Northern Africa by Jacques M. May, p. 108.

TABLE 7

COMPARISON BETWEEN NUTRIENT REQUIREMENTS AND DIET PER CAPITA

PER DAY IN TUNISIA (URBAN AREAS) 1960

<u>Nutrients</u>	<u>Require- ments</u>	<u>Excess or Deficit in Percentages</u>			
		<u>Group 1</u>	<u>Group 2</u>	<u>Group 3</u>	<u>Average</u>
Calories	2,150	+6	-26	-48	-27
Total Proteins (Grams)	61	+10	-35	-48	-31
Animal Proteins (Grams)	30	-60	-93	-97	-86
Calcium (Mg.)	1,120	-78	-89	-92	-87
Iron (Mg.)	11	+27	-25	-40	-20
Vitamin A (I.U.)	4,150	-47	-77	-83	-72
Vitamin B ₁ (Mg.)	1.10	+27	-14	-30	-14
Vitamin B ₂ (Mg.)	1.50	-55	-76	-78	-72
Vitamin P-P (Mg.)	11.40	-8	-44	-57	-37
Vitamin C (Mg.)	69	+43	-8	-41	-10

Source: Un Faubourg de Tunis, Enquete Nutritionnelle et Medicale, Ban Salem, Claudian, Laieb,
as cited in the Ecology of Malnutrition in Northern Africa by Jacques M. May, p. 108.

TABLE 8

DISTRIBUTION OF CALORIES AND NUTRIENTSBY ECONOMIC AND SOCIAL LEVELLower Level

<u>Calories and Nutrients</u>	<u>Consumption Level</u>	<u>Percentage of the Population</u>		
		<u>Rural</u>	<u>Urban</u>	<u>All Tunisia</u>
Calories	(2,000	30	12	25
Total Protein	(5 g	30	12	25
AP*	(20%	70	34	61
TP				
Calcium	(400 mg	50	27	44
Vitamin A	(4,000 IU	50	27	44
Vitamin C	(55 mg	30	12	25
Vitamin B ₂	(1.4 mg	70	35	61

Middle Level

<u>Calories and Nutrients</u>	<u>Consumption Level</u>	<u>Percentage of the Population</u>		
		<u>Rural</u>	<u>Urban</u>	<u>All Tunisia</u>
Calories	2000 - 2500	30	25	29
Total protein	55 - 70 g	50	50	45
AP*	20% - 40%	29	46	33
TP				
Calcium	400 - 600 mg	40	30	42
Vitamin A	4000 - 5000 IU	30	25	29
Vitamin C	55 - 70 mg	40	40	40
Vitamin B ₂	1.4 - 1.7 mg	20	26	22

Upper Level

<u>Calories and Nutrients</u>	<u>Consumption Level</u>	<u>Percentage of the Population</u>		
		<u>Rural</u>	<u>Urban</u>	<u>All Tunisia</u>
Calories	) 2,400	40	63	46
Total protein	) 70 g	20	58	30
AP*	) 40%	1	20	6
TP				
Calcium	) 600mg	10	43	18
Vitamin A	) 5,000 IU	20	48	27
Vitamin C	) 70 mg	30	48	35
Vitamin B ₂	) 1.7 mg	10	30	17

*Ratio of animal protein to total protein.

Source: Report of the Third African Conference on Nutrition and Child Feeding.

TABLE 9

SOURCE OF CALORIE AND DAILY PROTEIN INTAKE

<u>Type of Calories</u>	<u>Sources of Calories</u> (percent)				<u>Total (Tunisia)</u>
	<u>Large Cities</u>	<u>Other Towns</u>	<u>Scattered Units</u>	<u>Total (Rural)</u>	
Starches	62	67	68	68	66
Proteins	11	11	11	11	11
Fats	<u>27</u>	<u>22</u>	<u>21</u>	<u>21</u>	<u>21</u>
TOTAL	100	100	100	100	100

Average Daily Protein intake
(in grams)

<u>Proteins</u>	<u>Large Cities</u>	<u>Other Towns</u>	<u>Scattered Units</u>	<u>Total (Rural)</u>	<u>Total (Tunisia)</u>
Total proteins	67.7	59.8	67.3	63.7	64.8
Cereal protein	41.4	43.4	53.5	49.3	47.1
Animal protein	15.0	8.3	7.0	7.4	9.3
Animal protein as a percent of total	22.0	14.0	10.0	12.0	14.0

TABLE 10

TUNISIA FAMILY PLANNING CENTERS, 1972

<u>Governorates</u>	<u>Population (in thousands)</u>	<u>Area (Km²)</u>	<u>Number of Centers</u>	<u>Population per Center</u>	<u>Area Served By Center (Km²)</u>
Tunis	1,181	5,579	42	28,119	132.8
Bizerte	325	3,604	28	11,607	128.7
Beja	304	5,341	22	13,818	242.8
Jendouba	280	3,031	17	16,471	178.3
Le Kef	343	8,063	20	17,150	403.2
Kasserine	231	9,130	10	23,100	913.0
Gafsa	375	18,400	13	28,845	1,415.4
Medenine	269	56,354	19	14,158	2,966.0
Gabes	228	29,150	32	7,125	910.9
Sfax	497	8,834	38	13,079	232.5
Kairouan	303	6,978	27	11,222	258.4
Sousse	607	6,138	36	16,861	170.5
Nabeul	338	3,008	23	14,696	130.8
TOTAL	5,281	163,610	327	16,150	500.3

TABLE II

TUNISIA: FAMILY PLANNING ACTIVITIES BY CATEGORY OF CENTER, 1972

Centers	New IUD Insertions		New Pill Acceptors		Tubectomy		Social Abortions		Consultations	
	No.	%	No.	%	No.	%	No.	%	No.	%
Principal and Regional Hospitals	2,788	21	1,334	10	2,250	92	3,455	75	11,589	27
Auxiliary and District Hospitals	930	7	1,753	14	49	2	32	1	4,204	10
MCH Centers	5,255	40	5,732	45	6	-	232	5	15,208	35
Communal Dispensaries	846	7	1,334	10	-	-	-	-	3,531	8
Rural Dispensaries and Mobile Teams	1,101	8	1,719	13	6	-	3	-	4,011	9
Others	2,207	17	1,005	8	146	6	881	19	4,847	11
Total	13,127	100	12,877	100	2,457	100	4,603	100	43,390	100

TABLE 12

TUNISIAN: OCCUPANCY RATE AND DURATION OF STAY IN HOSPITALS, 1971

<u>Type of Hospital</u>	<u>No. of Hospitals</u>	<u>No. of Hospital Beds</u>	<u>Occupancy Rates (percent)</u>		<u>Duration of Stay (days)</u>	
			<u>General</u>	<u>Ob/Gyn</u>	<u>General</u>	<u>Ob/Gyn</u>
Institutes	4	1,095	85.1	-	26.8	-
Specialized Hospitals	5	1,497	95.3	-	66.1	-
Principal Hospitals	7	4,755	75.9	72.2	10.9	2.9
Regional Hospitals	12	2,876	76.1	87.0	8.6	3.8
Rural Hospitals	54	2,272	56.9	38.0	7.0	2.9
Maternity Homes	<u>7</u>	<u>76</u>	26.6	26.6	3.1	3.1
TOTAL	89	12,571	75.4	65.1	11.6	3.2

Source: Statistiques 1971, Republique Tunisienne, Ministere de la Sante Publique, Service Central des Statistiques Sanitaires.

Table 13

Tunisia: Geographical Distribution of Physicians, 1973

Governorates	<u>Physicians</u>							
	Population <u>1/</u> (in thousands)	<u>In Public Sector</u>			<u>Number of Physicians</u>			Physician/ Population Ratio
		In Private Practice	Part- time	Full- time	Tunisian	Foreign	Total	
Tunis	1,181	68	118	265	297	154	451	2,529
Bizerte	325	4	4	40	9	39	48	7,104
Beja	304	1	2	18	4	17	21	14,857
Jendouba	280	2	-	19	3	18	21	9,198
Le Kef	343	3	1	25	6	23	29	12,241
Kasserine	231	-	1	10	1	10	11	23,090
Gafsa	375	4	-	29	3	30	33	11,818
Medenine	269	3	2	15	5	15	20	13,850
Gabes	228	-	4	15	4	15	19	12,631
Sfax	497	10	14	47	24	37	61	8,081
Kairouan	303	1	-	17	3	15	18	18,444
Sousse	607	6	10	60	30	46	76	7,894
Nabeul	<u>338</u>	<u>1</u>	<u>2</u>	<u>35</u>	<u>16</u>	<u>22</u>	<u>38</u>	9,052
Total	5,281	103	158	585	405	441	846	6,335

1/ As of January 1971.

- Sources:
1. Profils Demographiques Socio-Economiques et Sanitaire Regionaux-
Republique Tunisienne, Ministère de la Santé Publique, INPF et PMI (p.4).
 2. Recensement du Personnel de Santé, 31.12.1972, République Tunisienne,
Ministère de la Santé Publique, Service Central des Statistiques (pp.5,
8 and 10)

Table 14

HEALTH SECTOR ASSISTANCE TO TUNISIA - 1973

Program Area	Source	Period of Assistance	Total Over Period (\$)	Nature of Assistance
<u>Communicable Chronic Diseases</u>				
Malaria eradication	UNDP/WHO	1969-75	145,000	Expert and supplies
Malaria eradication	WHO	1967-75	451,000	Malariologist and supplies
Schistosomiasis control	WHO	1970-75	186,000	Malacologist and supplies
Cancer control	WHO	1972-75	29,000	Consultant and supplies
<u>Delivery of Health Services</u>				
Medical personnel	Belgium	1964-	76,000 in 1973	3 physicians
Medical team, Menzel Bourguiba	Belgium	1971-76	5,214,000 (includes following 3 projects)	8 professionals at hospital, Fellowships.
Public Health Team	Belgium	1970-75	-	8 physicians for preventive medicine project.
Hospital maintenance	Belgium	1970-74	-	4 technicians.
Surgical team, Sfax	Belgium	1972-78	-	5 professionals.
Medical personnel	Bulgaria	1962-	N.A.	157 physicians throughout the country.
Medical personnel	Canada	1971-75	N.A.	1 pediatrician 9 nurses

<u>Program Area</u>	<u>Source</u>	<u>Period of Assistance</u>	<u>Total Over Period (\$)</u>	<u>Nature of Assistance</u>
<u>Delivery of Health Services</u>				
Medical personnel	China	1973-	N.A.	20 physicians, various specialities, occupationalists.
Medical personnel	France	Open ended	N.A.	129 physicians, 6 nurses.
Medical personnel	Hungary	Open ended	N.A.	1 physician
Medical personnel	Poland	Open ended	N.A.	21 physicians
Medical personnel	Czechoslovakia	1963-	N.A.	36 physicians
Medical personnel	U.S.S.R.	1967-	N.A.	43 physicians
Medical personnel	CARE/MEDICO	1971-74	120,000	2 physicians, technicians, consultants.
<u>Manpower development</u>				
Nursing education	UNDP/WHO	1969-74	120,000	Personnel and fellowships
Medical education	WHO	1961=	1,015,000 (1967-75)	Professors and fellowships
Medical education	WHO	Open ended	60,000 in 1973	Fellowships
Nursing education	Canada	1972-76	700,000	Personnel for Avicenne school.

<u>Project Area</u>	<u>Source</u>	<u>Period of Assistance</u>	<u>Total Over Period (\$)</u>	<u>Nature of Assistance</u>
<u>Family Planning/MCH</u>				
Family Planning and MCH	UNFPA/WHO	1971-75	468,000	Personnel, fellowships, supplies
Demographic studies	UNFPA/WHO	1971-74	6,000	Two fellowships
Family Planning	FRG	1971-76	250,000	Budgetary support, consultants
Family Planning	Netherlands	1969-74	122,000	Physicians and nurses for service delivery, Le Kef
MCH	Sweden	1971-74	48,100	Training of midwives and nurses aides.
<u>Nutrition</u>				
Child nutrition (SAHA)	Sweden/UNICEF	1972-75	867,000	Material and equipment for manufacture of protein rich food.
<u>Administration/Other</u>				
Health statistics	UNDP/WHO	1969-74	149,000	Consultant to assist in data collection.

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A N N E X C

EDUCATION AND MANPOWER DEVELOPMENT - Chapter
from IBRD March 1974 Appraisal Mission

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20. EDUCATION

A. Introduction

20.1 The Tunisian Government has always regarded the expansion of education as a pre-condition of economic development and a means of social progress. The Government sought first to establish universal primary education and then to expand the number of places at secondary and higher levels as rapidly as resources would permit. Since Independence there has been considerable quantitative progress towards these objectives. Primary school enrollment has increased threefold - from about 320,000 in 1953 to 934,000 in 1971. Secondary school enrollment is up sixfold, from 33,000 in 1953 to 194,000 in 1971. Enrollment at the post-secondary level has increased fivefold, from 2,160 in 1959 to 11,000 in 1971. In terms of rates of population in school, between 1956 and 1971 primary school enrollment increased from 29 to 73 percent of the 6-14 age group, secondary enrollment from 11 to 42 percent of the 15-19 age group, and university enrollment from 0.1 to 3 percent of the 20-24 age group. This expansion imposes a heavy financial burden on a country still at an early stage of development. Tunisia now allocates to education about 6.5 percent of its GDP and over 30 percent of public recurrent expenditures.

20.2 Historical Background - When Tunisia became independent in 1956, the educational system reflected, on the one hand, the influence of Islam, reflected in the establishment of a number of schools with a religious orientation centered upon the az-Zaitouna University (the Zaitounain Schools) and, on the other hand, the influence of France, which had led to the establishment of a system of schools on the French model, teaching a French curriculum. Among the latter are the Sadiki Schools, founded in 1875, in which courses in the Arabic language and culture were fitted into a basically French educational pattern. The education system did not aim to extend literacy to the masses, nor did it produce the skilled manpower upon which rapid economic growth depends. In 1949 only 12 percent of Arab children between 5 and 14 years old were in elementary school, and out of a total Arab population of 3.2 million, only 6,700 were in secondary school, and fewer than 1,000 in technical schools.

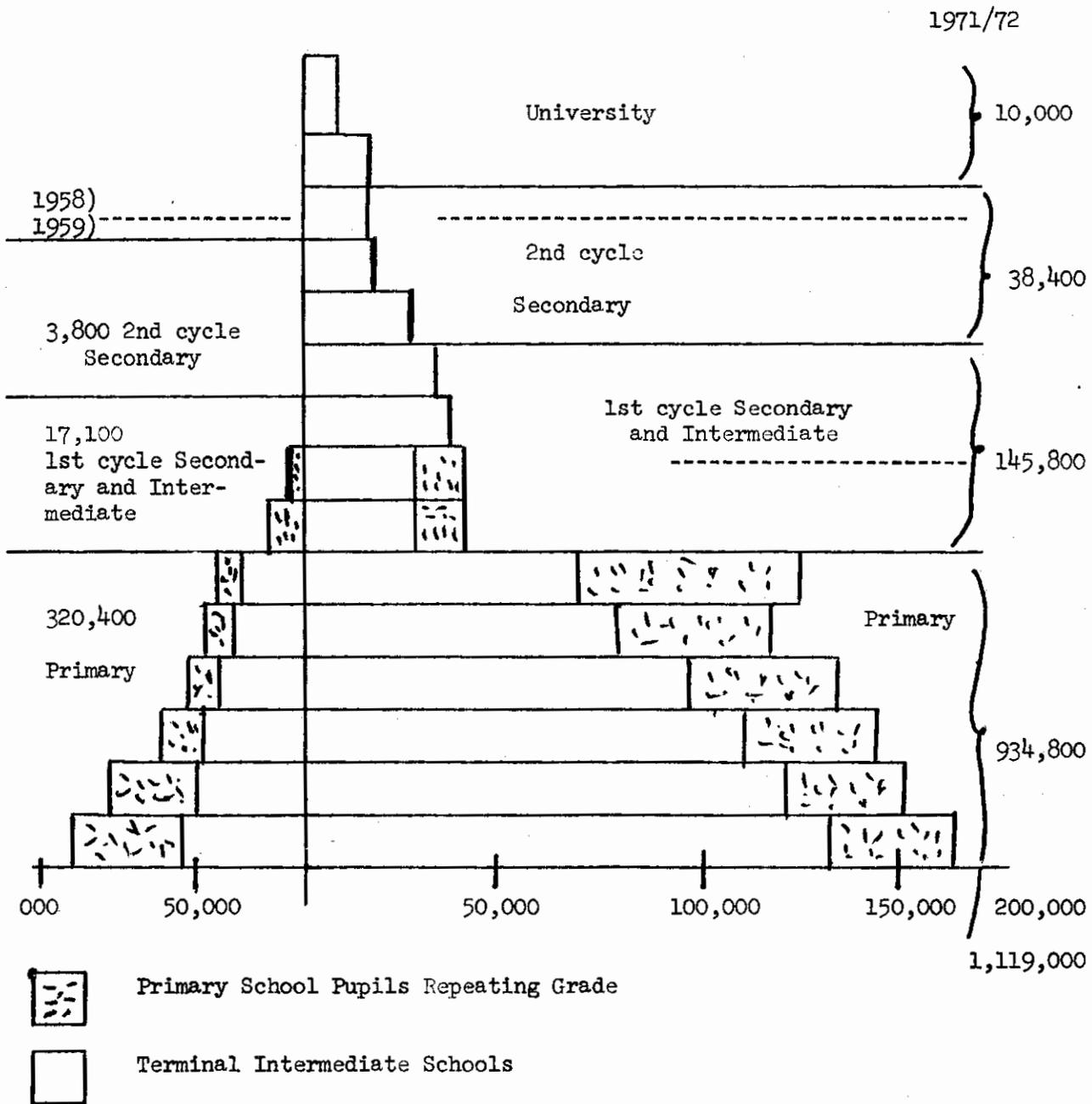
20.3 After Independence the Tunisian Government addressed itself, within the framework of the 1959 Ten-Year Plan for Education Development, to the remodeling and expansion of the education structure. The Education Reform Act of 1958 provided that the religious schools should gradually be merged into the state school system. It did not cover the French schools, which were then conducted by the French Cultural and University Mission primarily for the benefit of French children, but increasingly admitting Tunisians. Nor did it cover the vocational training schools operated by the Ministries of Social Affairs and Agriculture, and other institutions.

B. The School System

20.4 The school system as reorganized on the basis of the 1958 Act introduced language and other reforms into what remained basically a French structure: six years of elementary school leading, through an external and

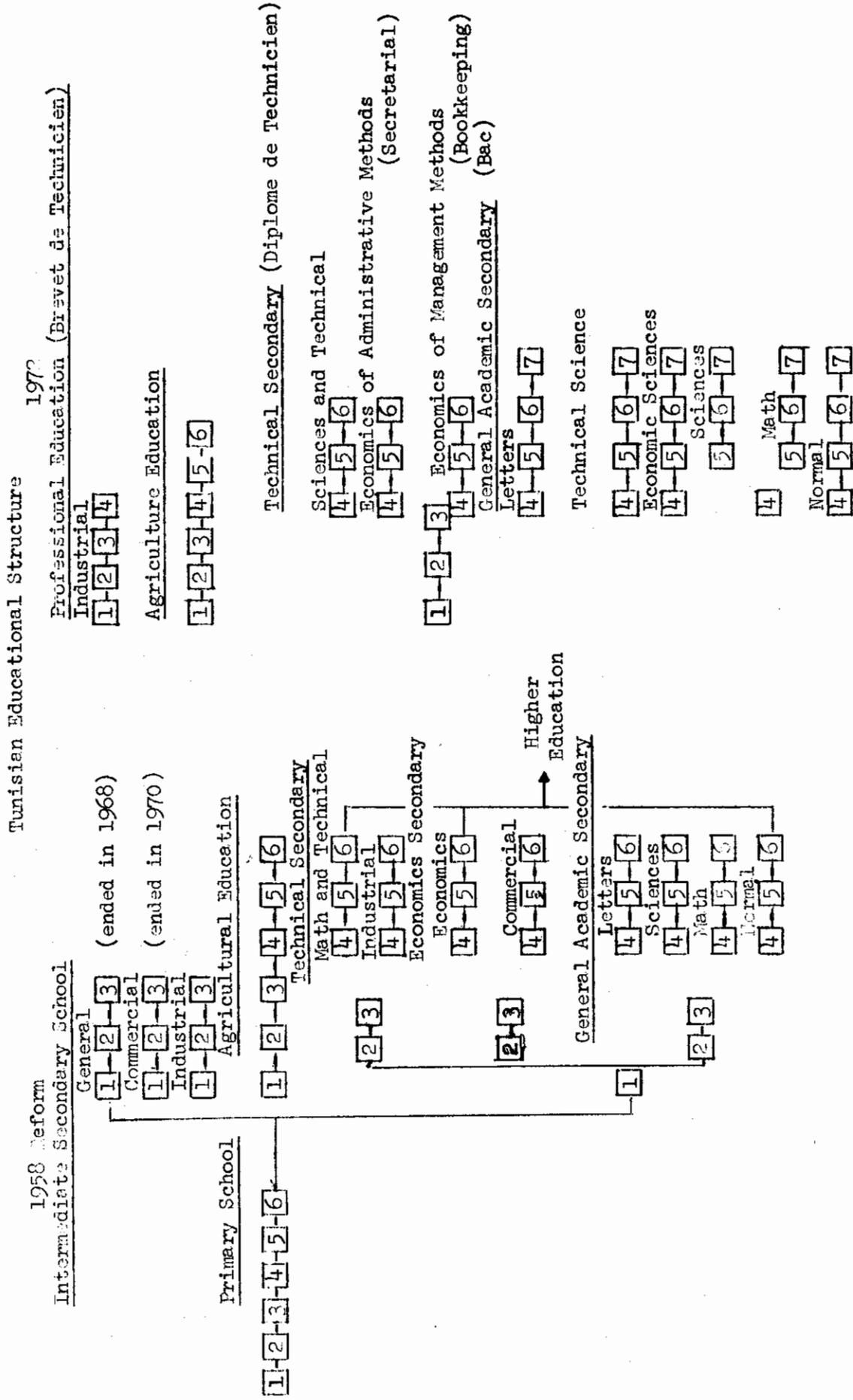
Diagram I

Educational Pyramid: 1958 and 1972



Source: Kinsey, p. 2/5 and Tunisia, MEN, Statistiques Essentielles de l'Education Nationale pour l'annee 1971-72.

Diagram II



Source: Synthese, p. 36, Kinsey, p. 1/21.

competitive examination, to either three years of intermediate or six years of secondary school. Arabic was introduced as the medium of instruction for the first two years of primary school, then concurrently with French; the latter remains predominant at the secondary level. The French language is considered an "indispensable but associated" vehicle of culture.

20.5 The classical academic type of elementary school is found almost everywhere, even in the most remote areas. The function of these schools (923,000 pupils in 1970/1971) is mainly instruction in the "3 Rs", French and some civics. A final certificate is in practice given only to those pupils who succeed in passing the secondary school entrance examination. The remainder are considered as dropouts, although they have completed the course of instruction. Approximately 30 percent of the pupils do not complete primary school and a further 23 percent fail to qualify for secondary. Thus, half of all primary school leavers, after taking an average of eight years to pass through the six grades, will have reaped relatively little benefit from their studies. The other half normally qualify for admission to secondary school. About one-third of these go to intermediate schools^{1/} (12,000 pupils in 1970/1971), which have replaced the old-fashioned craft schools and, in a three to four year course, combine more appropriate forms of vocational education with further general education. They are intended to provide the basic skills needed in the lower ranks of industry, government and business. About 75 percent complete the course, and about half of these go on to further training.

Table 20.1: GROWTH OF SCHOOL ENROLLMENT

<u>School Year</u>	<u>Primary</u>		<u>Secondary</u>		<u>Higher</u>	
	<u>Students</u>	<u>Index</u>	<u>Students</u>	<u>Index</u>	<u>Students</u>	<u>Index</u>
1956 - 1957	226,919	100	32,924	100	2,140	100
1957 - 1958	266,288	117	32,149	98	2,164	101
1958 - 1959	320,362	141	32,934	100	2,489	116
1959 - 1960	361,532	159	35,732	109	2,157	101
1960 - 1961	408,758	180	40,317	122	2,478	116
1961 - 1962	465,577	205	45,751	138	2,309	108
1962 - 1963	527,373	232	51,433	156	2,869	134
1963 - 1964	593,059	261	58,938	179	3,396	159
1964 - 1965	658,766	290	67,793	206	4,587	214
1965 - 1966	717,093	315	82,548	251	5,456	255
1966 - 1967	777,686	342	100,525	305	5,903	276
1967 - 1968	810,795	357	118,411	359	6,686	312
1968 - 1969	844,994	372	135,947	413	7,668	358
1969 - 1970	900,519	396	161,382	490	9,413	440
1970 - 1971	922,861	407	180,522	548	10,343	484
1971 - 1972	934,827	412	184,125	559	10,992	514

Source: Ministère de l'Education Nationale.

^{1/} "College moyen" from 1959 to 1970; "education professionnelle" from 1971.

20.6 The other two-thirds of pupils accepted into secondary school follow the regular secondary cycle. Until 1972 the secondary schools (21,000 new entrants in 1970/1971) were based on the principle of progressive specialization, in two three-year cycles. After one common year, pupils were divided into technical, economic and general streams. During the second three-year cycle, each stream divided into a number of optional sections, including teacher training, with strongly differentiated curricula. The grammar and science tracks, as well as the economic and the technical-mathematical options, led up to the "Baccalaureat" examination which guarantees entrance to the university. Other sections, including teacher training, were considered vocational and led to a certificate (Brevet or Diploma). About two-thirds of entrants dropped out, and about 40 percent of the final-year students failed to get their diplomas. In 1963 the seventh year was reintroduced. In 1971 a number of changes were introduced, primarily to reduce the intake into secondary schools from 40 percent to 25 percent of primary school leavers, and secondly to expand the intermediate schools and integrate them more closely into the general secondary system.

20.7 Primary teachers are trained in four teacher-training colleges and in a growing number of training sections (18) in secondary schools. Until a training college for secondary teachers was established in 1965, secondary teachers were expected to have university degrees. All student-teachers, either in the University of Tunis or abroad, receive substantial grants, provided that they commit themselves to serve as teachers for a minimum of ten years. This commitment is strictly enforced.

20.3 The University of Tunis, established in 1960, comprises, in addition to faculties of science, law and economics, arts, medicine and theology, the following specialized institutions: (i) the Advanced Teacher-Training College, (ii) the Pedagogic Center, (iii) the Advanced School of Law, (iv) the College for advanced Commercial Studies and (v) the Normal School for Assistant Secondary School Teachers. There are also research centers for (i) economics and social studies, (ii) arid-zone studies, (iii) atomic physics, and (iv) audio-visual aids.

20.9 Agricultural education, which was not covered by the 1958 Education Reform Act, is provided under the auspices of the Ministry of Agriculture by means of schools at the secondary and higher levels, special vocational centers and, more recently, in short seminars for farmers. The Ministry of Social Affairs is responsible for a program of general vocational training.

20.10 In sum, in the decade of the 1960s Tunisia's school system developed substantially, to the point where, in the Third Plan (1969-1972), investment in education totalled D 35.6 million, about 5 percent of total investment. The share of the ordinary national budget allocated to the Ministry of National Education has risen from 19.4% (1961) to 25.7% (1965), 27.2% (1968) and 30.5% (1972). As a proportion of GDP, total expenditures for education (capital and current expenditure) channeled by the Ministry of National Education rose from 4.5% in 1962 to a peak of 7.1% in 1970.^{1/} **Practically all education expenses are met from public funds, but the number of pupils in private schools is now**

^{1/} This total does not include expenditure on professional and agricultural training. In 1972, total expenditure reached D 60 million but accounted for only 5.9% of GDP owing to the exceptional growth of the latter (Annex, Table).

expanding at a rate of more than 10 percent per year.

20.11 The purpose of the 1958 reorganization was to achieve universal primary education. Science, technology and agriculture have not received the desirable and necessary attention. The expansion of schools has been determined by criteria derived from the system itself, so that the rate of growth has been based on considerations of admittance and enrollment rather than of manpower needs. The financial implications of this evolution were accepted without contest up to the year 1964. Since then the financial authorities have expressed concern about the rapid increase in education expenditure.

C. The 1959 Targets

20.12 The aims of the Ten-Year Education Plan, established in 1959, intended to be achieved within the span of a student's school career, were universal primary education and a significant rise in output at the intermediate and secondary levels. Problems of teacher training and school construction were simplified by a number of expedients. At the primary level, the curriculum and the weekly schedule of instruction were reduced, the teacher-student ratio was increased from 1:40 to 1:57, and school space was economized by double-sitting the first grades, so that, on the average, seven grades of pupils needed no more than five classrooms. In secondary schools, the reduction of the foreign school-age population and the important contribution by expatriate teachers had the same effect. In addition, the course was reduced from 7 years to 6 years. These expedients gained the time needed to bring teacher training and school construction to the level necessary for the planned increase of enrollment.

20.13 Enrollment targets were calculated exclusively in terms of gross input. For primary schools, first grade places were to increase annually by 10 percent of the 1958 enrollment until the whole estimated 6-plus age group was in school. The primary "pyramid" was then estimated by assuming an annual attrition rate of 1 percent and a repeater rate of 25 percent. From these assumptions, the needed numbers of teachers and classrooms were calculated. For secondary enrollment, the key was the proportion of primary graduates permitted to enter secondary education, at first set at 37 percent and later raised to 40 percent; in 1971 it was lowered to 25 percent.

20.14 Broadly, the delayed impact of the larger primary enrollment was expected to be felt by 1963 in intermediate schools, by 1971 in six-year secondary schools, and by 1975 at the university level. It was expected that the most difficult period would be when enrollment sharply increased at each level, so that a maximum of investment would be needed and operational expenditures would rise at a corresponding rate. The expected stabilization point was 1972 for primary (with an estimated total enrollment of about one million pupils); 1975 for intermediate; and 1978 for the six-year secondary schools. The rate of continuance from primary to secondary should then reach 34 percent.

20.15 The 1958 forecasts provided a sufficiently precise frame of reference to enable the education authorities to manage the system within the limits of the policies then adopted. The chief deficiency of the 1958 projections

was to overestimate the eligibility of young school leavers for jobs and to underestimate the increase in school-age population. In fact, 75 percent of the new jobs called for experienced workers and for training on the job for which no provision was made. Adjustments of the school-age population forecasts have led to successive decisions to postpone the target date for universal primary education.

D. An Appraisal of the System

(i) Primary Education

20.16 It was predicted that universal primary enrollment would be attained for the first grade in 1966/1967, and would reach the entire 6-14 age group by 1972/1973. In 1966 the enrollment of first-graders was only 77 percent of the projected figure. Resources intended for primary school expansion were transferred to secondary and higher education. A slight decline in the proportion of children aged 6-14 in primary schools indicates that primary enrollment may have reached a plateau, partly because of a reduced emphasis on the early achievement of universal primary education in areas where population is widely dispersed and unit costs consequently high, and partly because primary education for girls has not yet won full acceptance in some areas. As regards regional difference, the enrollment rate ranges from 57 percent in Kasserine and 59 percent in Jendouba, to 81 percent in Tunis and 82 percent in Nabeul. And as regards in-school rates according to sex, in 1971/1972 about 85 percent of the boys in the 6-14 age group were in school, but only 58 percent of the girls. In Kasserine only 34 percent of girls are in school, compared with 75 percent in Tunis. Although starting from a very low percentage, the enrollment of girls has expanded only slightly more rapidly than that of boys.

Table 20.2: PRIMARY ENROLLMENT: PROJECTED AND ACHIEVED

	Projected in 1958 for 1966/67	Projected in 1964 for 1966/67	Achieved in 1966/67	Achieved in 1970/71
Enter 1st Grade	154,000	-	118,000	124,000
All Grades	837,000	879,000	846,000	935,000

20.17 The combined effect of the two-shift system, the reduction in class hours from 30 to 25 for grades 3-6, and the elimination of the 7th grade was to reduce the total number of class hours for primary school. Courses developing manual skills, physical education and art were either omitted or severely reduced. The quality of teaching varied considerably over time and space. The number of primary teachers of French nationality declined until the late 1960s. They still constitute a majority in the private schools. Since the 1958 Reform Act more than 1,000 teachers have been trained each year, so that not the 20,000 "instituteurs" and "moniteurs" are Tunisian. The percentage of "instituteurs" and "moniteurs" varies considerably according to region. In Le Kef and Jendouba

only 29 and 30 percent of the teachers are the better qualified "instituteurs" while in the Sfax and Tunis regions the percentages reach 60 and 63. The salaries of primary teachers average 30 dinars a month, about the full-time earnings of an agricultural laborer. Primary teachers' salaries are about 40 percent of secondary salaries. The capital cost of creating a new job in primary education is about 60 dinars, and could be even less if school construction methods were simplified and more intensive use made of existing buildings.

20.18 One of the most serious problems of primary education is the high repeater rate. The effects of dropouts, repeaters and cumulative repeaters on primary, and even secondary education, is revealed by an analysis of the school careers of 1,000 children. Almost 18 percent left school before completing the fourth grade; 54.4 percent reached the last year of primary school without any delay; and those entering secondary school had on the average spent eight years completing the six-year primary curriculum. This situation in all probability cannot be cured by administrative measures; a drastic restriction of the right to repeat under the present system would probably result in an undesirable increase in dropouts. The main causes are apparently the excessive requirements of the curriculum and, above all, the traditional means of assessing achievement by formal examinations. More basic adjustments are needed. Two kinds of solutions are possible: either to extend the number of grade years in the primary cycle or to adjust the level and content of the curricula and examinations to correspond to the education level required of the pupils after completion of primary school. The most practical solution might well be to extend the primary cycle to 7 years and adjust the education level.

20.19 Before 1969, French was begun during the third grade. In 1969 it was begun in the first grade, a year later in the second grade. For the first three years arithmetic is taught in Arabic and for the last three in French. The switch to French means that students who are weak in French are likely to remain poor in arithmetic. Moreover, the Arabic taught in the classroom is literary Arabic, which is more complex than spoken. Studies are apparently needed to evaluate the advantages and disadvantages of beginning instruction in French during the first years of primary school.

(ii) Secondary Education

20.20 Secondary education in Tunisia is a complex operation involving three ministries - Education, Agriculture and Social Affairs. The initial (1961) and revised (1965) plans for the expansion of secondary education and the achievement over the period 1961-1972 are summarized in Table 20.3. Total Ministry of Education secondary enrollments in 1971/1972 were only 57 percent of the 1961 projection, but 80 percent of the 1965 revised projection. This was mainly the result of budgetary constraints during the middle 1960s. In addition to the 38,000 "technical" students under the Ministry of Education, there were 30,900 students not under the Ministry, i.e. a total of 68,900 receiving technical education in 1971/1972. About one half of these, or about 34,000, enter the job market each year to compete for barely 10,000 openings (75 percent of the new jobs created are for experienced workers, not apprentices).

Hence unemployment among technical school graduates is rising. The paradox of a growing social demand for secondary school places and a lagging growth of economic demand for the services of secondary school graduates is unlikely to disappear. The jobs held by expatriates until the early 1960s have now been filled by Tunisians, and new jobs are no longer available at the rate which prevailed in the 1960s. While there are no comprehensive estimates of the number of unemployed school leavers, partial studies appear to indicate an increasing trend. Extension of the period of schooling would not, apparently, help to improve their job prospects. It appears that the solution to this problem lies rather in a review of the nature and structure of secondary education to give greater emphasis to practical technical instruction.

Table 20.3: SECONDARY ENROLLMENT: PROJECTED AND ACHIEVED
(Numbers of Pupils)

	Actual <u>1961/62</u>	Projected In 1961 For 1971/72	Projected In 1965 For 1971/72	Achieved In 1971/72
<u>Ministry of Education</u>				
Academic	28,966	222,000	152,658	156,316
Professional	<u>13,959</u>	<u>103,000</u>	<u>76,329</u>	<u>37,809</u>
Total	42,925	325,000	228,987	184,125
<u>Ministry of Agriculture</u>				
Lycees (7 years)	-	-	-	1,418
Shorter program	-	-	-	<u>7,164</u>
Total	-	-	-	8,582
<u>Ministry of Social Affairs</u>				
Vocational education				
Basic	-	-	-	14,000
Other I	-	-	-	9,326
Other II	-	-	-	<u>7,618</u>
Total	-	-	-	30,944
Total	-	-	-	223,651

Source: Ministère de l'Education Nationale, Ministère de l'Agriculture,
"Formation des Cadres: Plan Quadriennal, 1973-1976."

20.21 Another issue in secondary education has been its dependence on foreign teachers, who accounted for 34 percent of the total in 1971/72, the same proportion as in 1965/66, the earliest year for which data are available, even though over the same period the number of secondary and professional teachers virtually doubled.

20.22 Admission to secondary school is based on an examination in Arabic, French and arithmetic. Yet the 1972 National Commission on Education and Research reports that only a small proportion of students, "thanks to favorable family and social conditions, achieve a sufficient knowledge of one language or the other". Before 1970, 40 percent of the sixth-grade primary students were admitted into secondary school on the basis of their examination grades. In 1970 the standard was raised. The number of students admitted to secondary schools then fell, from 41,955 (41 percent) in June 1969 to 32,663 (25 percent) in June 1971 (Table 20.4). This shift in policy is probably having an inequitable effect, in that an even higher level in French is now required for admission to secondary school and this places students from the poorer homes and rural areas at a disadvantage.

Table 20.4: TRENDS IN ADMISSIONS TO SECONDARY SCHOOL

	<u>Sixth Grade</u>	<u>Admitted Secondary</u>	<u>Percent Admitted</u>
1961/1962	32,822	14,644	39
1968/1969	101,899	41,955	41
1969/1970	119,580	41,543	35
1970/1971	133,166	32,663	25

Source: Ministère de l'Education Nationale.

Table 20.5: GIRLS AS A PERCENTAGE OF SECONDARY STUDENTS,
MINISTRY OF EDUCATION

	<u>1961/62</u>	<u>1971/72</u>
General Academic Schools	22.7	28.7
"Professional" schools	25.1	26.7
Total	23.6	28.4

Source: Ministère de l'Education Nationale.

20.23 The increase in the number of students has led to extreme pressure on school accomodation. Laundry rooms, gymnasiums, infirmaries, and even warehouses are used to house students. Schools planned for 800 have had to take 1,400. Because of these pressures, the curriculum has had to be simplified and the number of class hours reduced.

20.24 These circumstances have caused feelings of instability and insecurity among teachers, parents and students. For example, when the 6th grade of secondary was the last grade it took the average student 8 years to reach it; but the vast majority did not reach the last grade, since they either dropped out or were pushed out. For the intakes beginning their first year of secondary education during the period 1961-1970, the number of dropouts is estimated at 75 percent (academic secondary 81 percent; professional secondary 63 percent).

Table 20.6: GRADUATES AND DROPOUTS ESTIMATED FOR SECONDARY INTAKES FROM 1961-1970

	<u>Total Entered</u>	<u>Percent Graduate</u>	<u>Total Graduate</u>	<u>Total Dropout</u>	<u>Dropout/Year/Intake</u>
Academic	202,565	19	38,487	164,078	16,408
Professional	92,808	37	34,339	57,469	5,747
Combined	294,373	25	72,826	221,547	22,155

Source: Ministère de l'Education Nationale.

(iii) Vocational Training

20.25 (1) Non-Agricultural. To fill the jobs of non-Tunisian workers following Independence, vocational training centers were organized. In 1966 the Office of Vocational Training and Employment (OFPE) ^{1/} was created in the Ministry of Social Affairs to coordinate and manage training. Three types of training are given: Pre-apprenticeship, adult and retraining/upgrading. Pre-apprenticeship training is usually for one year and accepts primary school leavers and dropouts. The courses provide a basic knowledge of Arabic, French, workshop calculations, technical science and drawing, and also develop a range of practical skills (fifteen hours per week). In 1966 there were 60 centers and about 3,000 students. The initial plan was to expand rapidly to 120 centers and 6,000 students, but by 1972 the numbers were unchanged from the 1966 levels (Table 20.7). Adult training aims at achieving skill in a narrow field in a 6-month course. In 1966 there were 12 centers and by 1972 27, of which 14 were in Tunis or Sousse. About 7,200 students are trained each year. Retraining/upgrading courses vary in length from six months to two years, and are mainly for the training of teachers for the vocational centers. The training is for two years, and is carried out at five centers, of which the most important is the National Institute of Productivity and Vocational Training at Rades. The number of workers trained in both the adult courses

^{1/} Now the "Office des Travailleurs Tunisiens à l'Etranger, de l'Emploi et de la Formation Professionnelle".

and the retraining/upgrading courses was about the same in 1972 as in 1966. The adult training courses are of about six months and the number trained has averaged about 10,500 a year (Table 20.7).

20.26 OFPE also supervises other vocational training, which includes a new pilot program in the primary schools, in-plant apprentice training and other courses given by correspondence or in the evenings. The table below indicates the levels of these programs in 1972. Finally, there is a range of non-agricultural training opportunities that are not supervised by the OFPE and mostly under the Ministries of Social Affairs and Education. The total number of non-agricultural students receiving some vocational education outside the Ministry of Education is estimated at 27,400 per year in all.

Table 20.7: BASIC VOCATIONAL TRAINING IN 1972

	<u>Classes</u>	<u>Students</u>
A. <u>Pre-apprenticeship</u>		
Fundamentals (Men)	43	2,341
Fundamentals (Women)	7	271
Hotel (Men)	<u>3</u>	<u>381</u>
Total	57	2,993
B. <u>Adult Training</u>		
1st degree	298	5,216
2nd degree	128	1,918
3rd degree	<u>4</u>	<u>68</u>
Total <u>/1</u>	430	7,202
C. <u>Adult Retraining/Upgrading</u>		
	15	350
Total A, B and C (six-month period)	287	10,545

/1 Of which 1,988 are in construction trades, 1,246 in metal working, and 367 in other skills.

Source: Ministère des Affaires Sociales, OFPE, February 1972.

20.27 (2) Agriculture. The agricultural sector was severely affected by the withdrawal of expatriate technicians in the late 1950s and early 1960s. Before Independence, only one Tunisian had graduated from the Faculté d'Agro-nomie. Agricultural training has usually been the responsibility of the Ministry of Agriculture except for a short period in the late 1960s, when it was transferred to the Ministry of Education. The courses range from the training of specialized workers to preparation for university degrees.

TABLE 20.8: OTHER VOCATIONAL TRAINING IN 1972

	Centers/Firms	Students
Primary schools (5th and 6th grades)		549
<u>In-plant Apprenticeship:</u>		
Construction	-	1,602
Metals	-	3,175
Other	-	3,060
<u>Other Courses:</u>		
Evening		380
Correspondence		560
Total		9,326

Source: Ministère des Affaires Sociales, OFPE, February 1972

TABLE 20.9: VOCATIONAL TRAINING, UNDER MINISTRY OF SOCIAL AFFAIRS (number of students)

Organization	1971	1972
Office National de la Pêche	274	459
Union Nationale des Travailleurs Tunisiens	760	800
Union Nationale des Agriculteurs	3,153	2,837
Inst. Orient	382	356
Ecole de Montfleury	30	29
Centre de Formation d'Assistants en Gestion	67	142
Beaux-Arts	210	207
Service Social ^{/1}	197	113
Institut National de Nutrition	69	136
Croissant Rouge	27	42
Institut National des Sports	211	247
Ecole Normale des Maîtres d'Etude Primaires	153	154
Ecole Nationale des Cadres et de la Jeunesse	88	81
Ecole Nationale d'Administration	531	530
Union Nationale des Femmes Tunisiennes	1,500	1,500
Office des Céréales	15	15
Total	7,667	7,618

^{/1} This is inside the Ministry of Social Affairs

Source: Ministère du Plan, 1973

20.28 Formal agricultural education and training begins at the college moyen level. Three-year courses to train field officers (agents techniques) are given in eight of these colleges to pupils who have completed their primary education and not less than 14 years of age. Upon leaving, some 60 percent of the pupils pass into a vocational training school from which they emerge two years later as junior technical assistants (adjoints techniques) or as instructors in government service: a further 25 percent secure direct employment on farms or in other agricultural undertakings. For the remaining 15 percent, three agricultural schools provide second-cycle secondary education leading to employment as senior technical assistants, agricultural teachers, and farm managers. The course is of three years, and receives equal intakes from the first cycle of general secondary education and from the agricultural collèges moyens; during the first year the former group receives agricultural subjects and the latter a general scientific training. During the second and third years, common courses are followed in one of three main streams: scientific, technical, and instructor training.

20.29 Some 75 percent of those who obtain the secondary agricultural studies diploma find immediate employment in government or the private sector. The remaining 25 percent enter the Ecole Nationale Supérieure d'Agriculture de Tunis (ENSAT), where they are joined by entrants who have completed the second cycle of general secondary education. The courses, of four and six years, lead to diplomas in agricultural and agronomic engineering respectively.

20.30 An entirely different path leads from the primary school to the Agricultural Vocational Training Centers. Recruiting pupils of 14 and 15 years of age, the centers offer two-year courses leading to certificates marking the completion of elementary agricultural studies or of agricultural apprentice training. The curriculum includes general education and farm economics, together with technical subjects, selected according to the areas served, which include irrigation, sheep farming, fruit farming, cattle rearing, forestry, commercial grasses, horticulture, agricultural machinery, fishing, and rural feminine crafts. In addition to these full-time courses, producing practical farmers with a sound knowledge of modern methods and techniques, the centers also provide one-week to three-months upgrading courses for farm workers wishing to keep abreast of recent developments or to qualify for promotion.

20.31 Table 20.11 shows the number of graduates, planned and actual, during the 1962-71 period. The number of specialized workers almost doubled over the period and the number of university graduates increased 3.6 times. However, the results range from 50 to 59 percent of the targets set in 1962. The 43 separate facilities under the Ministry have an unused capacity varying between 56 percent and 84 percent.

20.32 In general, the capacity of the system of vocational training appears fairly adequate, but the quality of the graduate of the non-agricultural training centers is not very high. Gaps exist in particular in training for special trade skills, and in the supervisory and higher technical grades in manufacturing, tourism and building and construction. In the training of primary school leavers and dropouts, formal education is emphasized at the

expense of practical training. There is a lack of interest on the part of potential employers. In the agricultural schools, the problem is rather the misuse or misdirection of the graduates and their limited suitability for field work. This is partly due to the method of selection, with its urban basis and its lack of emphasis on rural background and vocational motivation.

Table 20.10: STUDENTS AND SCHOOLS IN AGRICULTURAL EDUCATION, 1972

	<u>Centers</u>	<u>Capacity</u>	<u>Students</u>	<u>Graduated Year</u>	<u>Percentage of Capacity</u>
(A) Vocational Training (stagiaires)	17	..	4,500	4,500	..
Adult Training (Ouvriers Spécialisés)	<u>15</u>	2,760	2,005	<u>1,200</u>	73
Total	<u>31</u>			<u>5,700</u>	
(B) Lycées (Agents Techniques)	8	1,680	1,418	350	84
Technical Institutes (Ad-joints Techniques)	<u>3</u>	<u>780</u>	<u>433</u>	<u>110</u>	56
Total	<u>11</u>	<u>2,460</u>	<u>1,851</u>	<u>460</u>	
(C) Higher Education (Faculté d'Agronomie, ingénieurs)	<u>1</u>	330	<u>226</u>	<u>45 /a</u>	68
Total A, B, C,	43	..	8,582	6,200	..

/a Excludes 36 who graduated abroad.

Source: Ministère de l'Agriculture, Plan Quadriennal: Formation des Cadres, Tunis, 1973.

TABLE 20.11: PLANNED AND ACTUAL OUTPUT OF AGRICULTURAL EDUCATION

	Avail- able in 1962	Planned 1962-71	Achieved 1962-71	Achieved/ planned %	Output/ Year
Ouvriers Specialises	10,600	47,500	27,862	59	2,786
Agents techniques	-	5,417	2,838	52	284
Adjoints techniques	19	1,425	722	51	72
Ingenieurs	164	1,204	606	50	50

Source: Ministère de l'Agriculture, Plan Quadrennial: Formation des Cadres, Tunis 1973.

(iv) Higher Education

20.33 In 1961/62, the University of Tunis and other schools of higher education had 2,234 students. By 1971/1972 enrollment had reached 10,849. Higher education is open to all holders of the secondary school "baccalaureate" and only 6 percent of these fail to enroll. This requirement is often waived; 37 percent of first-year students in 1970/1971 did not have the baccalaureate. Some institutions for example, the Faculty of Theology and the Normal School of Assistant Teachers, do not require the baccalaureate. The distribution of students is given in Table 20.12. The supply of higher education places in Tunisia increased sufficiently to reduce the percentage of students studying abroad from 45 percent in 1960 to 30 percent in 1971.

TABLE 20.12: STUDENTS AND FACULTY IN HIGHER EDUCATION, 1971/72

	Students	Faculty	Students/ Faculty
Ecole Nationale d'Ingenieurs	266	74	4
Institut Supérieur de Gestion	133	24	6
Institut des Hautes Etudes Commerciales	108	10	11
Ecole Normale des Professeurs Adjoints	871	68	13
Faculte des Sciences	2,299	174	13
Faculte de Medecine	798	47	17
Faculte des Lettres	3,320	102	33
Faculte de Theologie et des Sciences Religieuses	867	18	48
Faculte de Droit	1,948	48	41
Total	10,610	565	186

Source: Ministère de l'Education Nationale

20.34 The quantitative objectives of the Perspectives and the three development plans were achieved. The goal was to have between 12,000 and 15,000 students in higher studies at home and abroad in 1971, and the actual figure was 14,073. The number actually graduated was 8,000, of whom 5,200 were from the University of Tunis. The demand for graduates was estimated at 11,000, of whom about 6,000 were needed for teaching, mainly at the secondary level. But, during the decade, only 2,000 were trained as teachers and of these it is estimated that half are not teaching but are working either in education administration or outside education.

20.35 Unemployed university graduates appeared for the first time in the fall of 1971 and in 1972 the number was larger. Because they were comparatively few in number, a considerable proportion was easily absorbed by jobs created in government for the purpose. However, even under optimistic assumptions about the rate of growth of GDP and the number of new jobs, the planned rate of expansion of the faculties for the next decade will probably mean that more graduates will be unemployed. These graduates, unlike "blue collar" workers, will not find a ready demand for their skills in Europe, which faces a similar disequilibrium except in a few fields, such as medicine, statistics, management and accounting. Some graduates could, however, find jobs in other Arab countries. A number could also go into primary and secondary teaching, after suitable training. While more years of schooling are often regarded as a net social benefit, these benefits will have to be carefully compared with the net benefits from alternative investments, the social and political problems of unemployed graduates, and the mounting financial burden of university education. The Government has now undertaken the definition of a specific policy for the training of manpower for higher education and of a clear strategy of career guidance.

(v) Adult Education and Literacy

20.36 To reduce the proportion of illiterates has been one of the Government's principal objectives but a nationally organized and financed program was not undertaken until 1965, at the same time as UNESCO began its campaign to promote functional literacy. Thus, the Tunisian program, supplemented by UNESCO, provided information useful for low-income adults as well as teaching the simple cognitive skills. The number of participants reached a peak of 41,000 in 1968/1969 and by 1971 had declined to 26,000. The program seems to have had less than the expected impact on the cognitive achievement or attitudes of the participants. An evaluation of the better program centers showed that four years attendance was necessary to achieve the proficiency of a sixth-grade primary student in Arabic reading comprehension. Adults with less than four years did worse than fourth-grade students, which meant they could not read and understand a national newspaper. The adults who did best came from the city, had had previous education, and had parents of higher socio-economic status. Finally, 34 percent showed a decline in reading ability two years after completing the course, while 48 percent showed a gain. Students with previous education were more retentive than those without.

Eighteen percent were unchanged. The program was costly since only 50 percent of each grade was permitted to proceed to the next. The costs per graduate of the 4-year course were as high as D 1,600. Since 1970 the program has been affected by a budget reduction and the number of participants has diminished. The 1966 census indicated a literacy rate of 55 percent of the population, on the basis of the number of people who had completed 4 years of primary school.

(vi) Private Education

20.37 Private education performed an important function in Tunisia before Independence. In 1972, the total number of private students was less than 3 percent of the number enrolled in public schools. There are two main kinds of private schools: schools staffed by French teachers and subsidized by the French Government, mainly attended by children of the elite, and schools attended by students of the middle and upper income groups who drop or are pushed out of the public secondary system. The former concentrate on academic subjects, while the latter provide a mixture of academic and commercial courses. With the reduction in 1970 in the percentage of primary students admitted to public secondary schools, the number of private students has increased at both primary and secondary levels. New "non-elite" private schools have opened across the country, 17 in 1972 alone. The number of students receiving private education was 21,000 in 1972, 20 percent more than in 1971.

(vii) Pre-School Education

20.38 Most pre-school education is in private institutions, some of which are subsidized by the French Government. In the middle 1960s, however, the Ministry of Social Affairs began to organize kindergartens, supported by local contributions, in which 4-6 year olds engage in supervised play and receive nutritious meals. Low-income students either pay half fees or nothing, according to the local contribution.

TABLE 20.13: STUDENTS AND SCHOOLS IN PRIVATE EDUCATION

	1971/72	1972/73
<u>Students</u> /1		
Primary	8,475	9,404
Secondary		
- Professional	2,056	2,596
- Academic	5,248	8,127
- Pre-Professional	1,189	1,189
Total	16,968	21,316
<u>Schools</u>		
Primary	36	39
Secondary	55	69
Total	91	108

/1 These include students at the French Mission schools:

	1971/72	1972/73
Primary	1,599	1,678
Secondary	2,262	2,655

Source: Ministère de l'Education Nationale

E. Cost and Efficiency of Education

20.39 Two studies 1/ on educational costs in Tunisia carried out in the past few years reached the conclusion that real costs per secondary and university student were high and rapidly rising. The costs per student for the three levels of the education system are given in Table 20.14 below. Secondary-education is at least seven times as expensive as primary. Agricultural education costs 17 times as much as primary, and higher education 41 times as much, per student. A major component of these high costs is the high salaries of foreign teachers, who constitute nearly half of the staff at the secondary and higher levels. Scholarships average D 75 per holder for secondary and D 406 for higher education.

1/ Basis, A & C Morrison: Les couts de l'Education en Tunisie, in Cahiers du CERES, No. 3, June 1970. Tibi, Claude: Economic Development and Financial Aspects of Education Policy: The Tunisian Case, The International Institute for Education Policy, Paris, 1972

TABLE 20.14: UNIT COSTS OF EDUCATION IN 1971
(current prices in dinars)

	Current	Capital	Total	Index
Primary ^{/a}	23 ^{/b}	1	24	100
Secondary ^{/c}	156	25	181	754
Vocational ^{/d} (Indust.)	202	6	208	867
Vocational (Agric.)	416 ^{/e}	-	416	1,733
Higher	762 ^{/f}	224	986	4,108

^{/a} Note de Synthese preparatory to Plan.

^{/b} Of which D 1.40 was spent on food, clothing, and scholarships.

^{/c} For 1970, and includes academic and professional.

^{/d} For 15,000 students.

^{/e} 1969.

^{/f} Of which D 406 went for food, tuition and scholarships.

20.40 The real cost of producing one graduate consists of the total cost of his education plus a share of the cost of the education of those students who did not graduate. This fails, of course, to take account of the benefits that may have accrued to the students who did not graduate.* The costs per graduate at each level of the education structure, when the costs of dropouts and repeaters are included; are shown in Table 20.15. The cost per primary graduate was D 394 in 1971. The cumulative cost of obtaining one secondary graduate (i.e., primary plus secondary) was D 4,792 and one university graduate D 19,582.

* Although these benefits are small for secondary students who do not reach "Brevet" certificate stage and are almost insignificant for primary students.

TABLE 20.15 COST PER GRADUATE IN 1971
(current prices in dinars)

	Cost Student (1)	Mean Years Required To Obtain Certi- ficate (2)	Cost/ Grad- uate (3)	Number of Non- Certi- ficate Students per Certi- ficate holder (4)	Mean Years School- ing Non- Certi- ficate Students (5)	Total Cost of Non- Certi- ficate Students (1)x(4) x(5) (6)	Cost Grad- uate (3)+(6) (7)
1. EACH LEVEL							
Primary	24	8	192	2.1	4	202	394
Secondary	181	9	1,629	5.2	3	2,769	4,398
Vocational(Indus)	208	4	832	2.7	2	1,123	1,955
Vocational(Agric)	416	7	2,912	3.0	3	3,744	6,656
Higher	986	6	5,916	3.0	3	8,874	14,790
2. CUMULATIVE							
Primary+Secondary	.	.	1,829	.	.	.	4,792
Primary+Voc(Ag)	.	.	3,104	.	.	.	7,050
Primary+Sec. + Higher	.	.	7,745	.	.	.	19,582

Source: Ministère de l'Education Nationale

20.41 Private studies 1/ made to measure the achievement of students as a function of school inputs, family background and personality show that the fact that some students score higher than others is probably due more to family background and personality rather than to the quality or quantity of school inputs. As regards measurement of non-cognitive educational achievement, the studies show that primary schooling has little effect in developing "modern attitudes" as measured on the Inkles modernity scale, but secondary schooling has a significant effect. These results appear consistent with those of recent educational research in other countries, and the questions they raise demonstrate the need to pursue the study of this problem.

20.42 Several studies have sought to determine the importance of schooling for lifetime earnings. Earnings are regarded as a function of schooling, ability, work experience, and parental socio-economic status. A national survey (Carnoy, Thias, Sack 1972) 2/ found that the predicted lifetime earnings of a worker with no education at all were just as high as those of a worker with full primary and two grades of post-primary schooling. The more schooling workers had after the second secondary year, the higher their earning. But, the older the workers in this group, the less important schooling below a certain level was in determining their earnings. For example, for schooling to be significant for workers above 40, they had to have had one year of university training. Contrary to expectations, workers aged 21-40 with vocational training were found to earn less than workers who had general education. Furthermore, training on the job was highly significant in determining earnings.

20.43 Equity in the education sector implies a proper distribution of benefits and costs, over the long term, between the different social groups. Unfortunately, the basic data available for Tunisia is limited and the intergenerational social mobility data required to answer these questions is quite incomplete. In 1970 the Ministry of Education classified students at the three levels of education according to social situation. The results are presented in Table 20.16. Since this classification could not be made for the primary-school group, it was assumed that the classification for the primary group corresponds to that for the population as a whole. In fact, this "estimate by residue" is far from objective, since most primary-school children come from the lowest income groups of the population. Even on this assumption, the proportion of students with fathers of high socio-economic status (SES) getting some higher education is 8.8 times as high as the proportion of high-SES students in the population. The lowest income group has only 27 percent of the places at the university level that would be expected if education were distributed absolutely equitably. Table 20.16 shows that in 1970 children in the upper income groups were clearly getting the lion's share of higher education. Account must, of course, be taken of the quite undemocratic nature of primary education at the time of Independence.

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- 1/ Carnoy, Martin, Hans Thias and Richard Sack, "Middle Level Manpower, the Links Between Socioeconomic Origin, Schooling, and Job History in Tunisia," Tone and Simmons, 1973. Simmons, John, "The Income Benefits from Formal and Informal Education, Estimates for a Socio-economic Model." Development Research Center, Harvard University, Cambridge, Mass., 1972. Erkut, Sumru, "A Theoretical and Empirical Study of Modernity as a Concomitant of Industrialization," Department of Social Psychology, PhD Dissertation, Harvard University, Cambridge, Mass., Nov. 1972.
- 2/ Carnoy, Martin, Hans, Thias and Richard Sack, "Middle Level Manpower, the Links Between Socioeconomic Origin, Schooling and Job History in Tunisia," Stone and Simmons, 1972.

TABLE 20.16: SOCIO-ECONOMIC STATUS OF STUDENTS' FATHERS (1970)
(percentage)

Socio-Economic Status	Primary (1)	Secondary (2)	Higher (3)	Ratio (3) (1)
High 1	1.2	5.9	10.5	8.8
2	26.5	40.0	26.2	1.0
3	12.7	20.8	17.6	1.4
Low 4	43.5	17.3	11.9	0.27
Other	16.1	16.0	33.0	2.0
Total	100.0	100.0	100.0	
Number of Students (000)	113.9	7.8	0.6	

Status: High 1: Highest white collar, professions, heads of firms and employees Category A.
 High 2: Employees Categories B and C, office staff and skilled workers.
 High 3: Foremen, semi-skilled or unskilled industrial workers.
 Low 4: Agricultural laborer and non-industrial unskilled workers.
 Other: Retired, without occupation, and father dead.

Source: Ministère de l'Education Nationale, Bureau de Planification.

F. The Fourth Economic and Social Development Plan, 1973-76

20.44 The preparatory documentation for the Fourth Plan, 1/ and the Plan itself, stress the absolute necessity of bringing the output of the education system into line with the needs of the economy. The Fourth Plan does not claim to solve all the problems posed by the structural imbalance of education. A committee has been set up to carry out a far-reaching reform of education during the Plan period. Alongside this work, the tasks of short-term education planning will be continued.

20.45 At the present stage, the policy and objectives defined by the Fourth Plan can be summarized as follows:

(i) Primary education

The starting point adopted for the development of primary education is the basic decision to create structures to

1/ Commission Nationale Sectorielle de l'Education et de la Recherche Scientifique, "Rapport de synthese sur l'education pour la decennie 1961-1972," July 1972; Ministère de l'Education Nationale, Note de Synthèse du Plan Quadriennal 1973-76: "Les objectifs quantitatifs et qualitatifs du systeme scolaire et universitaire," May 1973.

accommodate all school-age children that wish to enroll: the right of every child to primary education is assured without going so far as to make schooling compulsory. Primary enrollment is expected to increase from 884,000 in 1972/73 to 1 million in 1976/77, an annual growth of 3.3 percent; with this rate, which compares with 8.5 percent in the 1960s, it will be possible to cope with the population growth while continuing to improve the percentage of school-age children receiving schooling. The qualitative objectives of the Plan are, essentially: to improve the internal productivity of education by revising timetables and strengthening teacher-training, and to guide students toward scientific and technical careers through appropriate curricula adjustments.

(ii) Secondary education

Secondary school enrollment is expected to grow by 4 percent a year, from 172,000 in 1972/73 to 200,000 in 1976/77. Most of this increase will be in the technical, mathematics, science and vocational tracks. In order to steer a higher percentage of pupils toward these, it is proposed to strengthen the mathematics, sciences and technical courses, to increase the number of teachers in these subjects, and to prepare the necessary structures to handle the growing technical and vocational enrollment.

(iii) Higher Education

Having regard to the foreseeable number of secondary-school graduates (bacheliers), student enrollment is expected to increase from 10,650 in 1972/73 to 22,700 in 1976/77, i.e. at a rate of 22 percent a year. In addition to this substantial growth, the Fourth Plan identifies the other two problems that higher education will have to face: the imbalances between the scientific and technical disciplines on the one hand and literature and the arts on the other, which will tend to widen, and the low output of the studies. The measures to change the enrollment structure at the secondary level should make it possible to guide students towards the scientific and technical disciplines and progressively to redress the balance of higher education to fit needs. Thus, the Plan calls for an increase of 226 percent in enrollment in the Faculty of Sciences and the scientific sections of the Ecole Normale Supérieure, doubling of the enrollment in the Faculty of Medicine (from 1,000 to 2,250 in 4 years), and an increase in enrollment in the National Engineering Schools from 340 in 1972/73 to 2,120 in 1976/77.

Table 20.17: PROJECTED STUDENT ENROLMENTS,
FOURTH PLAN, 1973-76
(000 students)

	<u>1972</u>	<u>1973</u>	<u>1974</u>	<u>1975</u>	<u>1976</u>	<u>Percent Growth 1972-1976</u>
Total Primary	883	918	950	975	999	13.2
Total Secondary	172	182	191	199	200	16.4
- of which Professional	18	27	34	41	41	124.4
Total Higher	11	12	14	18	23	109.0

Source: Ministère de l'Education Nationale and Ministère du Plan.

20.46 For teachers, the Fourth Plan gives detailed projections only for the secondary level. It appears that a sufficient number of teachers can be trained to cope with the increase in school population at the primary level. In higher education, the large increase in student enrollment will call for a substantial effort to develop the needed teaching staff. In the case of secondary education the present enrollment structure, in terms of its distribution among the various faculties, means that it will not be possible, in addition to supplying the new needs, to replace the expatriate teachers during the Plan period in certain subjects such as mathematics, physics and chemistry, and French. On the other hand, the output of the University in other subjects, for which teaching is the main outlet, such as Arabic, History and Geography, will far exceed recruitment opportunities in secondary education. According to the Fourth Plan the number of secondary teachers will increase from 5,560 in 1973/74 to 6,280 in 1976/77; the number of Tunisian teachers will increase from 3,750 to 5,390, while that of expatriate teachers will fall from 1,810 to 890.

20.47 The capital budget of the education system for the 4 years of the 1973-76 Plan is nearly D 40 million, or 14 percent of the total capital expenditure of the Government provided for in the Plan. During the preceding Plan period (1969-72), the capital expenditure on education amounted to D 36 million, i.e. 20 percent of the Government's capital budget. To this must be added D 4 million a year assigned to the schools of agriculture and D 1 million a year assigned to vocational training. During the same period, the operating expenditures of the education system will rise by 8.4 percent a year to D 72 million in 1976. According to the Plan forecasts, total education expenditure (capital and operating) in 1976 would account for 6 percent of GDP, i.e. slightly less than in 1970/71 (6.5 percent).

G. Elements of a New Orientation

20.48 Taking it that the objectives of education are essentially to contribute to economic growth, to the social development of the people and to greater social equality between population groups, the preconditions for achieving these objectives are three:

- (i) The efficiency of education investment must be improved by adapting the teaching to the needs of the economy and of the individuals;
- (ii) conditions must be fostered that allow equality of access to education and to the advantages it brings;
- (iii) education planning must be developed so that it may better satisfy the needs of society.

The Government's policy and the measures taken during recent years are consistent with this orientation. However, there is a need to give even greater attention to the factors, both inside and outside the education system, that would help to expand the number and range of productive jobs, to narrow the artificial differences, in wage levels, to ensure a smoother transition from school to working life, and to facilitate access to both scholastic education at all levels and other forms of education.

(i) Basic Education

20.49 Formal education to a minimum level of verbal and quantitative skills associated with literacy is essential for self-learning, further formal education and more active participation in economic and social life. It is also important to define as precisely as possible what constitutes an adequate level of literacy and what kind of education this calls for, so that the necessary adjustments may be made. Curricula, textbooks and practical work for the primary or basic cycle need to be revised to adapt them better to the dominant economic and social activities in the country. This would contribute both to the social objective of universal literacy and to raising productivity and improving the participation of the poor. Other basic reforms of primary education that could be studied include increased local contribution to school construction, raising the primary entry age, automatic promotion, mastery learning, the use of school leavers as para-professionals, and accelerated training aimed at re-entry of young people and adults into the school or university system.

20.50 The purpose of the certificate of primary education under the present system is essentially to select students for secondary school and not to attest to a particular level of education. Since only about 25 percent of the school population continue their formal education beyond primary, and the remaining 75 percent are left to develop their skills and knowledge for employment as best they can, it seems essential that the primary cycle be geared chiefly to the needs of this 75 percent. Because the curriculum is directly linked to the examination system (since the weight

given to a subject in the examination, and the form the questions take, largely define the method and content of teaching), it is essential to redefine the role of the primary certificate and to devise methods of selection that are appropriate to the amended curricula and, at the same time, efficient and equitable.

20.51 The present system of examination of cognitive achievement, which is heavily biased in favor of French language ability, has the effect of discriminating against rural and low-income students. While bilingual instruction has been the subject of considerable debate in the past few years, little evidence exists to suggest either how efficient or how fair the suggested alternatives are. This information should be collected and evaluated to provide insight into the issue. Furthermore, although technical workers require psychomotor ability, students are not tested for it and it is not correlated with cognitive achievement. Thus, an important group of students who would learn to be skilled technicians, if promoted to intermediate school, are excluded. Questions that need to be studied include the efficiency of available pedagogic methods and methods of improving reading comprehensive and developing non-cognitive skills.

(ii) Secondary and Higher Education

20.52 Given the present numbers of students in the pipeline, let alone the increases projected for 1973-1976, it may be expected that the system will increasingly produce dropouts and certificate holders who will not find jobs to match their school qualifications or aspirations. It would follow that number of years of schooling required for middle and upper level jobs should be reduced and part of the resources now spent on education allocated to other uses. The financial cost of successfully producing one university graduate, with uncertain prospects of finding a job, could create four new jobs in manufacturing. Once the basic skills for communication and further self-education have been provided, formal education opportunities could, in the light of the limited resources and jobs available, be geared more closely to the minimum educational requirements of the jobs that can be created, even if this means providing retraining later. For such a policy to be effective requires efforts to curtail excess demands for education on the one hand and to expand employment opportunities on the other.

20.53 The demand for post-primary training is inflated for a variety of reasons: (i) the supply of jobs is growing more slowly than the supply of school places; (ii) the income differential between modern and traditional sector employment remains artificially high and is widening; (iii) employers and government tend to give preference to educational "longevity" even though additional increments of formal education may add only marginally, if at all, to productivity, and (iv) the cost of education borne by the individuals is out of line with the potential benefits. There is, as a result, a private demand for education far in excess of the economic demand in terms of higher-income, modern-sector employment opportunities. Educational enrollment should accordingly be more clearly related to the employment market. To reduce the

demand for education to a more realistic level, consideration might be given to making the beneficiary (as opposed to his family or society as a whole) bear a larger or rising proportion of his educational costs as he proceeds through the system, with appropriate subsidies and loan programs.

(iii) Vocational Training

20.54 For terminal pupils at primary, and also at higher levels, there is an urgent need for a more comprehensive effort to establish practical, job-oriented training schemes to assist in absorption into the labor market. Specialized training activities undertaken by several ministries might usefully be brought together into one unified system of extra-mural, second-chance institutions catering for both adults and drop-outs. These institutions could essentially give instruction in village or rural crafts and training in modern industrial and business skills, and by catering for all-round needs (craft-skills, agricultural knowledge, small-scale business, elementary management and general economics), could assist people to improve their future livelihood, particularly in rural areas, and orient young people towards opportunities on the land and in self-employed activity. Of equal importance in the modern urban sector is the development of comprehensive programs for on-the-job training.

20.55 Finally, consideration could be given to the desirability of a formal break of one, two or more years in academic training to give students a greater awareness of the alternatives open to them and of their own preferences and aptitudes and, with greater maturity, to benefit more from further academic training. Introduction of such a break at this stage of Tunisia's development could interrupt the pattern of growth of education expenditure and provide a breathing spell in which to resolve some of the difficult problems confronting the Government. Such a proposal could, for example, be adopted to ease the problem of staffing in rural development programs identified in other parts of this report. All persons successfully completing secondary education could be required to give one year of community service to the rural areas, including teaching, on a subsistence-level pay scale as a prerequisite for higher education. This concept could also be usefully applied again by requiring a further year of service as part of the program leading to final qualification; this could be counted as part of the individual's military service.