



REPUBLIC OF TUNISIA
MINISTRY OF AGRICULTURE

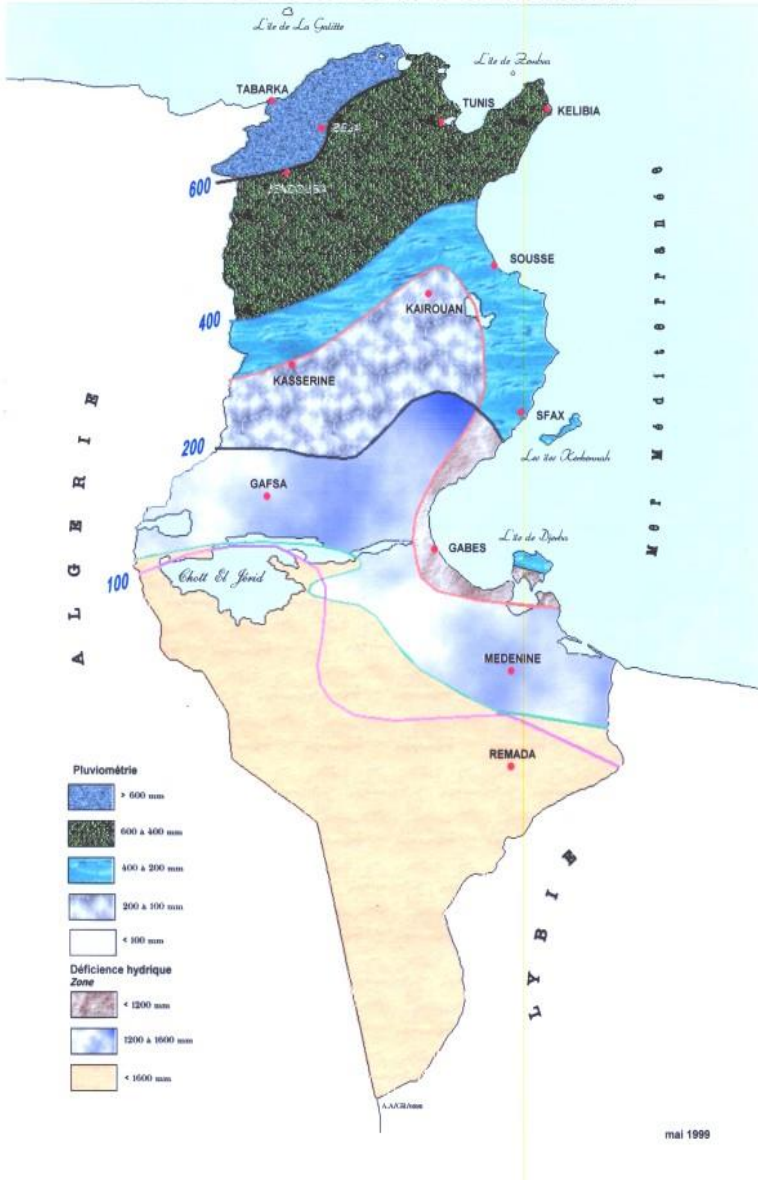
IRRIGATION IN TUNISIA

1st MEETING OF THE COMCEC AGRICULTURE WORKING GROUP
(June 6th, 2013, Ankara)

**“Increasing Agricultural Productivity in the COMCEC Region :
Improving Irrigation Capacity”**

INTRODUCTION

LA PLUVIOMETRIE EN TUNISIE



Tunisia is characterized by a semi-arid climate and an irregular rainfall system (230 mm/year average, 1500 mm/year in the North, and 50 mm/year in the South), combined with drought periods and torrential rain.

This climate and particularly the irregularity of rainfall make irrigation necessary.

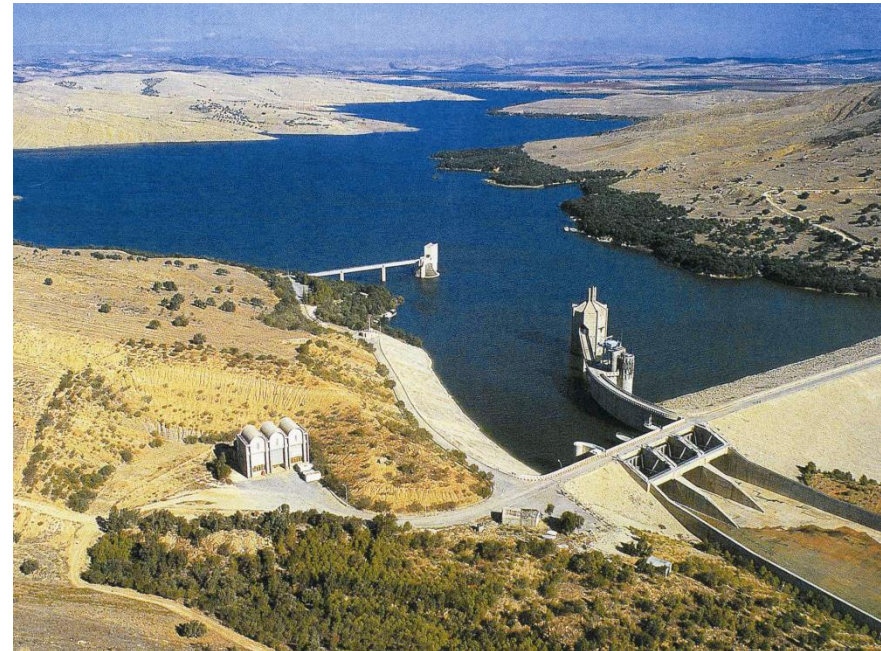
Several reforms were enacted in order to overcome the emerging difficulties and to address challenges in a globalization context of climate change.

WATER RESOURCES

In the Mediterranean basin, Tunisia is considered as one of the underprivileged countries in water resources. The mobilized water potential, 4800 million m³/ year, represents a quota lower than 500 m³/capita (poverty line). This figure tends to decrease with the increase of the population and the needs of all the development sectors.

Additionally, the country is facing water quality problems, in fact:

- 50% of conventional water resources have dry residue concentration RS > 1,5 g/l, and
- 30% have concentration in dry residue of RS > 3 g/l.



WATER ALLOWANCE TO AGRICULTURAL SECTOR

The average water allowance of to the agricultural sector is 2100 million m³/ year.

Water demand, which varies according to the yearly rainfall (dry or rainy year), is dispatched on average over the various concerned sectors as follows:

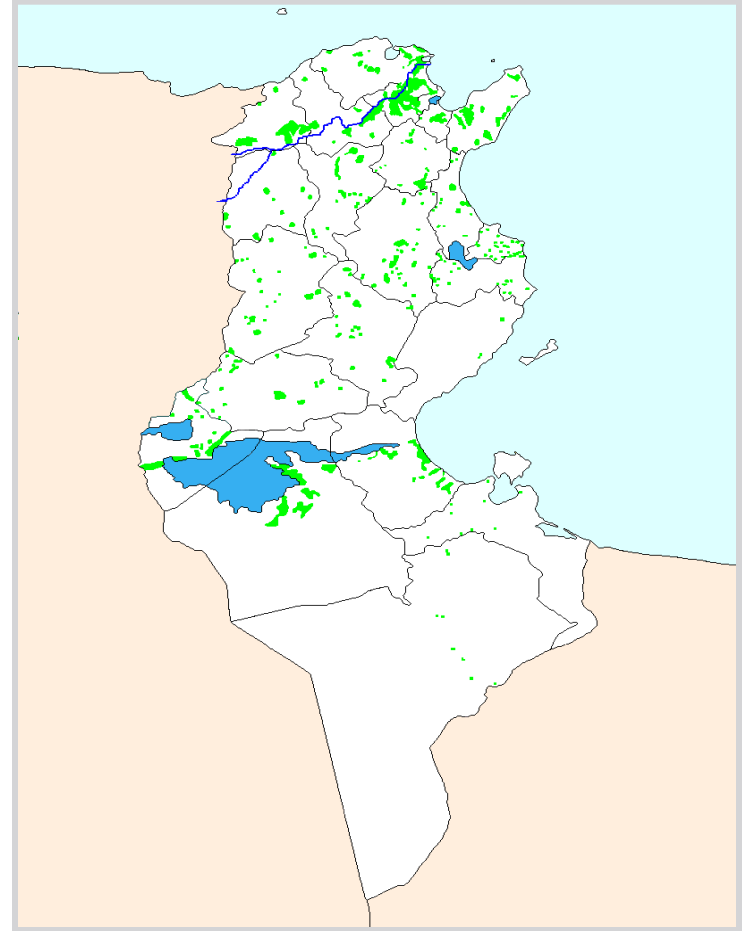
- Irrigation : 80%**
- Drinking water : 14%**
- Industry : 5%**
- Tourism : 1%**

The agricultural sector is subject to competition of the other sectors in droughts periods.

IRRIGATION SECTOR

Intensive irrigated perimeters cover 420.000 ha, and they were executed either through:

- ❖ **Public investments, covering 225.000 ha (54%),**
- ❖ **Private investments covering 195.000 ha (46%).**



The latter are executed upon the farmers' personal initiatives, mainly irrigation from shallow wells, private wells, or from rivers.

IRRIGATION SECTOR

The irrigated surface area is 420.000 ha, are distributed according to the water sources as follows:

- Surface water : 43 %**
- Aquifer surface water : 33 %**
- Underground water : 23 %**
- Treated waste water : 2 %**

It is distributed over crops as mentioned hereinafter:

- Vegetables : 33,0 %**
- Field crops : 28,5 %**
- Fruit trees : 26,0 %**
- Olive trees : 12,5 %**

IRRIGATION SECTOR

Irrigated perimeters represent only 8% of the useful agricultural area, yet they contribute with:

- 37% of the total value of the National agricultural production**
- 10% of the export value of agricultural Products**
- 90% of vegetables production**
- 75% of fruit production**
- 27% of agricultural labor**

PROBLEMS OF IRRIGATION SECTOR

Public irrigated perimeters executed after the independence are equipped with networks of open air canals (trapezoidal or semi-circular). Collective irrigation networks, which became decayed, are prone to frequent breaks, hence leading to subsequent water loss.

Tertiary networks, are in land in the majority of the old perimeters, causing a considerable water loss during water transport.

In these perimeters, water distribution mode is done respecting water tour; however, the existing pressure is insufficient to adopt the modern irrigation techniques.



Figure 22: Un canal d'aménagé parallèle à l'arroseur



PROBLEMS OF IRRIGATION SECTOR

Oases are characterized by:

- An important intensification
- Huge losses (60%)
- Continuous lowering of the aquifer level
- A progressive increase of salinity

Private perimeters are intensive and diversified.

- They overexploit the aquifers (thus a shortage is irrigation water, and aquifer salinisation)

➡ Specific actions for the protection of the irrigated perimeters are undertaken in some areas (aquifers recharging ...)

NATIONAL HYDRAULIC POLICY

Balance Interregional:

Simultaneously with the program of mobilization of water resources, thanks to the big dams constructed in the Northern areas, in the 80-90s the Tunisian Government initiated the implementation of big facilities of water transfer from extreme North to other areas, which are suffering from water shortage so that to reach an interregional equity and to answer the water demands of the various national economic sectors.

NATIONAL HYDRAULIC POLICY

Reinforcement of the irrigation sector:

Irrigation sector was the object of great actions of extension and rehabilitation and that within the frame of a regional strategy in sight:

- Sector development (New perimeters),
- To safeguard and modernize the existing perimeters, and
- To preserve overexploited aquifers.

In this regard, exploitation programs of water resources were implemented accounting to the existing various water resources.

NATIONAL HYDRAULIC POLICY

Strategic approaches:

Since the 90s, important reforms followed the investments efforts for the promotion of the irrigation sector and the rationalization of the water use.

These regulation, economic, and institutional reforms, aims mainly at:

- **The improvement of the efficiency of the collective irrigation networks (maintenance, rehabilitation, modernization),**
- **Improvement of the on-plot irrigation efficiency,**
- **Implementation of an adequate of irrigation water tariff system, and**
- **More active participation of users groups in the management of water systems.**

NATIONAL WATER SAVING STRATEGY

Water saving strategy aims principally at the improvement of water supply services, essentially for the preservation of the resources, reliability of the distribution, and rationalization of the utilization.

The scheduled water saving programs in the public irrigated perimeters consist in the rehabilitation, the modernization, and/or the sealing of the collective water distribution in order to:

- ✓ Contribute to water saving and make it available to farmers in adequate conditions of pressure and flow,**
- ✓ Rapid extension of the integration of on-plot water saving techniques, and**
- ✓ Transfer the public irrigated perimeters to water users associations in a convenient management conditions.**

IMPROVEMENT OF ON-PLOT IRRIGATION EFFICIENCY

In this frame, since 1995, the Tunisian Government adopted a National Program for Irrigation Water Saving, the objectives of which are essentially:

- ❑ The improvement of the on-plot irrigation efficiency,**
- ❑ A better economic valorization of water, and**
- ❑ The safeguard of the hydraulic resources.**

The allotment of a subsidy rate for the procurement of water saving equipments ranging from 40% to 60% of the investments according to the various categories of farmers, encouraged considerably farmers to adopt irrigation modern techniques and thereby an unprecedented expansion of on-plot water saving irrigation systems.

IMPROVEMENT OF ON-PLOT IRRIGATION EFFICIENCY

The National Program for Water Saving previewed the water saving equipments for all the irrigated areas.

Currently, 366.000 ha (87%) were equipped with water saving systems namely:

- 90.000 ha improved gravity,
- 116.000 ha sprinkler irrigation, and
- 160.000 ha drip irrigation (44%).

Water saving permitted the improvement of the promotion of the on-plot farming.



improved
gravity



sprinkler
irrigation

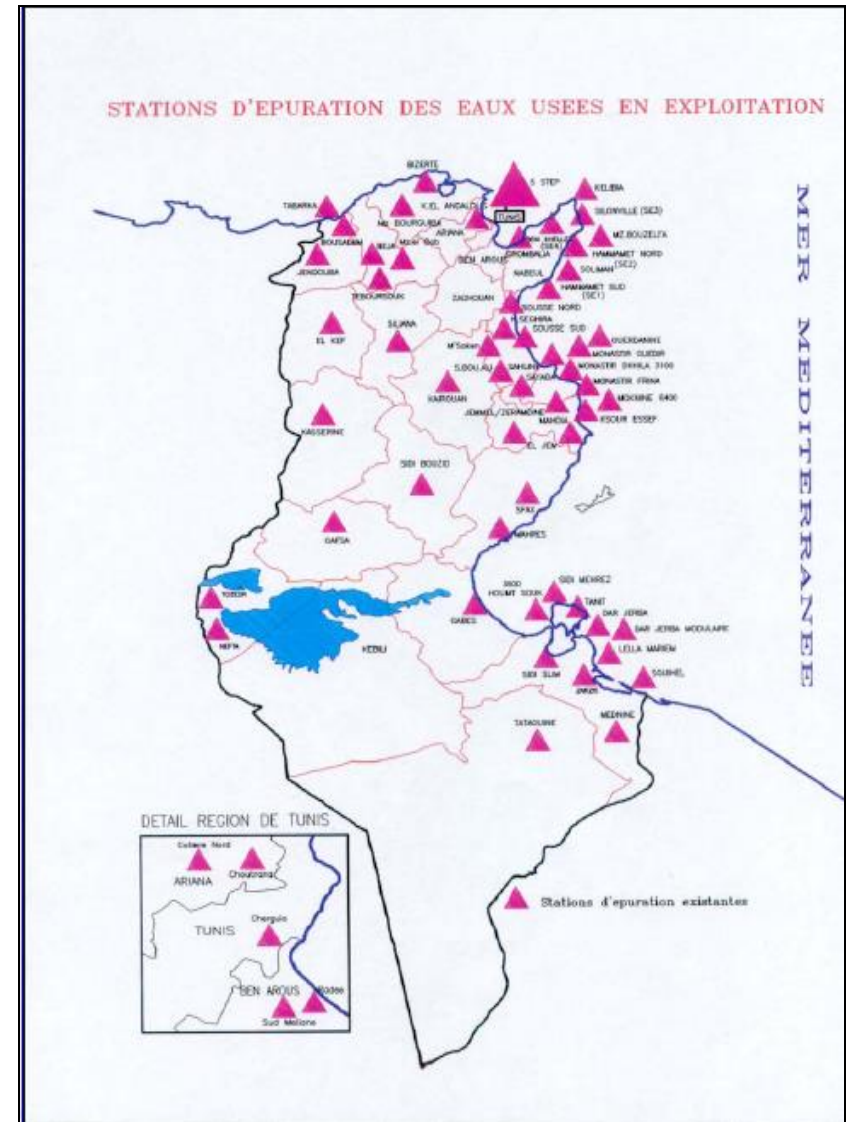


drip
irrigation

USE OF TREATED WASTE WATER

Currently, volumes of treated waste waters are estimated at 240 million m³/year produced by 110 sewage treatment plants managed by the National Utility for Sewerage (ONAS).

Sewage water is mainly treated at the secondary level. Around 50% of treated volumes are produced in grand Tunis area.



USE OF TREATED WASTE WATER

Currently, 17% of treated waste water (40 million m³) is reused in irrigation. In Tunisia, perimeters irrigated through reused treated waste water cover an area of 8.000 ha.

The total of the effective use of the treated waste water remains low, recording an average of 42%; this is due principally to the water quality as and to the non adherence of beneficiaries.



CONCLUSION

- The uses of water, in the medium term, approach the magnitude of mobilizable resources and shortages can worsen in the future.
- The mobilization of supplementary resources faces socio-economic and ecological obstacles. Costs have become very high.



In order to guarantee future water generations:

- A rational water use from all the stakeholders and particularly water users is necessary.
- More interaction with international partners is necessary for the capacity building in water domain.



**THANK YOU
FOR YOUR ATTENTION**