Republic of Tunisia
Ministry of Agriculture, Water Resources and Fisheries
Office of Water Planning and Balances

Annual Report on Water Sector 2023 Executive summary

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2023 Annual Report on Water Sector Executive Summary

Introduction

The annual national water sector report aims to provide an overview of the activities and achievements of the sector in the country and to inform stakeholders, decision makers and the public about the progress made in the realization of plans and programs. The preparation of the report, with the contribution of various structures and institutions working in the sector, is an appropriate framework for assessing achievements and discussing challenges facing water management. It is also an opportunity for consultation between the diverse stakeholders on possible solutions to improve the situation.

The report covers various aspects related to water such as governance, natural hazards and climate change.

The 2023 report was prepared by the Office of Water Planning and Balances at the Ministry of Agriculture, Water Resources and Fisheries, with external technical assistance, and based on the contributions of the structures involved in the sector in different ministries such as the Ministry of Environment and the Ministry of Health.

The report went through several discussions to enrich it, revise its content, and present it during the annual water sector meeting with stakeholders and technical and financial partners.

This document represents a summary of the Water Sector Annual Report 2023, and the full version in French can be found on the website of the Ministry of Agriculture, Water Resources and Fisheries.

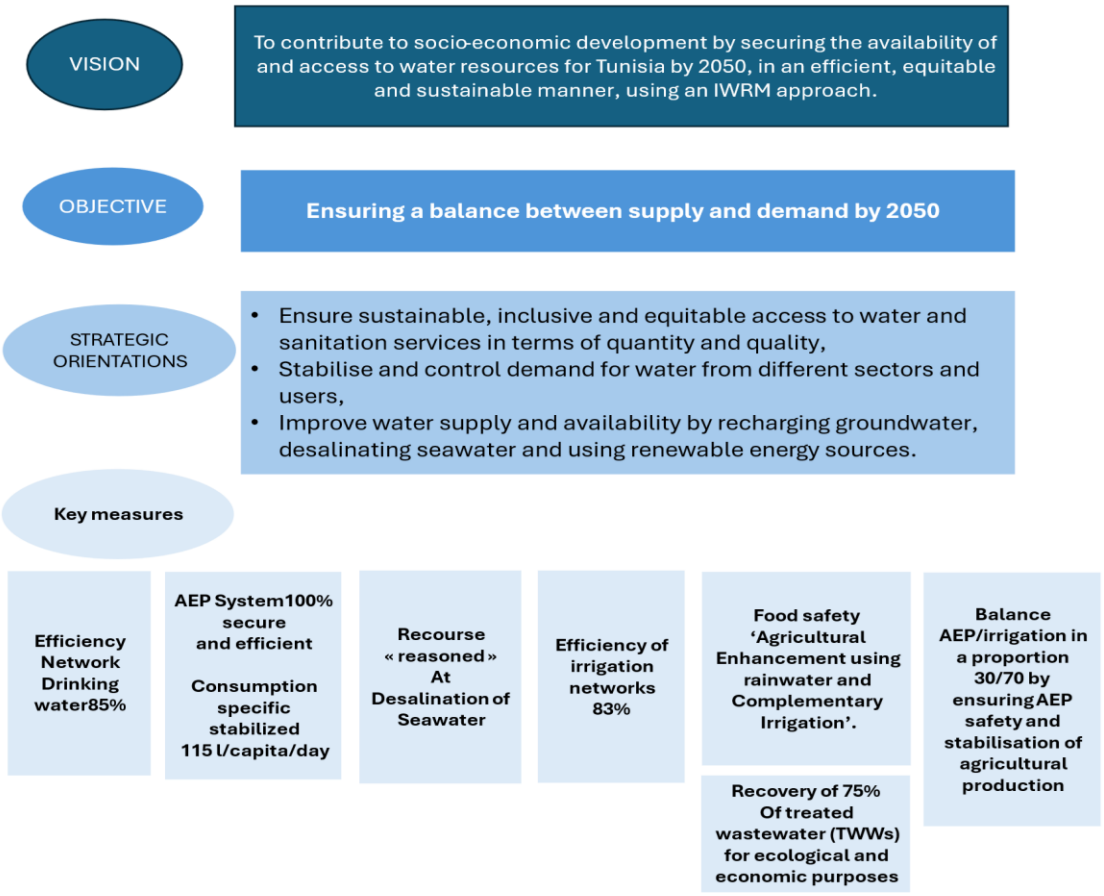
GENERAL SUMMARY

Declination of the Water 2050 Vision

In 2023, the National Water Sector Report was tasked with evaluating and analyzing the achievements related to the implementation of the Economic and Social Development Plan (ESDP) 2023-2025. This plan represents the first action plan of the Water 2050 strategy. For the water sector, the ESDP serves as a crucial transitional link to the future programs and initiatives outlined for the successful realization of the strategy through 2050.

Water Vision 2050 is summarized below, as a reference to the analysis of the situation in 2023.

Water Vision 2050 outlines a strategic framework for sustainable water management, aiming to address current and future challenges in the sector. This vision serves as a reference point for analyzing the situation in 2023.



The situation in 2023:

Global warming and water stress

2023 marked the 3rd hottest year on record for Tunisia. Several maximum temperature records were shattered throughout the year. The absolute Maximum Temperature: 49.1°C recorded in July in two places: Gabès on July 25; Médenine on July 29.

Autumn 2023 is recorded as the warmest autumn in Tunisia since 1950, surpassing even autumn 2022. The average temperature during the autumn season was 2°C above normal. This increase in temperature further confirms the trend towards a longer hot season in Tunisia.

The consistent rise in temperatures serves as a significant indicator of ongoing climate disruption, highlighting the urgent need for adaptive measures and sustainable practices in various sectors, especially water management.

The evolution of annual reference evapotranspiration shows an increase of 35 mm per decade from 1986 to 2023.

Rainfall averaged 20% less than last year and was highly contrasted geographically. The heaviest rainfall occurred in May, June and December 2023. The rest of the year was marked by a rainfall deficit.

Tunisia thus faced its fourth consecutive year of drought, with inflows to dams of 694 Mm^3 representing 38% of the average, and a national dam-filling rate reduced to 29% by the end of 2023.

Climate change has increased pressure on groundwater to make up for the shortage of surface water. The volume drawn from groundwater is estimated at 3.20 billion m^3 in 2023, compared to 3.06 billion m^3 in 2022, confirming the trend towards increasing exploitation, particularly through unauthorized extraction, estimated at 25% of total extractions.

The situation is critical for some heavily exploited aquifer systems, such as those in the Zaghouan governorate. Overexploitation is also leading to a deterioration in the quality of coastal aquifers such as Ras Jebel and the east coast of the Nabeul governorate.

The transfer of water from the far north of the country was massive, with the commissioning of new transfer systems from the Harka, Guamgoum and Moula dams, and the operation of previously little-used structures such as the Taref station and the Oued Cheir station to pump water from Sejnane and Joumine.
The State covered the energy costs of increasing transfers, which increased from 20 million dinars in 2022 to 41 million dinars in 2023.
In addition, the significant contributions from the Mellègue dam in May 2023 were transferred to the Sidi Salem dam, thus helping to ensure the supply of drinking water.

Appropriate measures for the management of dams and transfer systems

The Ministry of Agriculture, Water Resources, and Fisheries (MARHP) has implemented effective management strategies for dams and transfer systems to address the critical water shortage in Tunisia, prioritizing drinking water needs.

Key Actions Taken:

- Enhanced Water Transfers: Significant water transfers were initiated from the far north of the country, commissioned new systems from Harka, Guamgoum and Moula dams,
- Activation of underutilized existing infrastructures such as Taref and Oued Cheir Stations. These stations were employed to pump water from Sejnane and Joumine,
- Significant contributions from Mellègue Dam in May 2023 were transferred to the Sidi Salem Dam, ensuring a steady supply of drinking water,
- The government covered the increased energy costs associated with water transfers, which rose from 20 million dinars in 2022 to 41 million dinars in 2023.

Agricultural uses and quota reduction

With the aim of improving food security, the agricultural sector is the most important user of water, accounting for almost 75% of total consumption, most of which comes from groundwater.

In fact, the quotas allocated to the PPI from dam water have been considerably reduced, and distribution has been limited to two months only. In this regard and as an example, the irrigated PPIs of Sidi Salem were only able to benefit from 18.7 Mm3 for needs exceeding 100 million.

Needs are generally based on the following sectors: cereals, tomatoes and potatoes, livestock, olive oil, citrus dates and other tree crops.

These crops are experiencing a decline in yield and production, due to climate impacts and irrigation restrictions. The water footprint of these crops is negatively impacted. Climate scenario projections confirm that persistent water stress will lead to a decline in the share of green water compared to blue water in the total water footprint of irrigated crops, within the limits of available water resources in the medium term, leading to a reduction in cultivated areas, yield and product quality.

Part of the production is exported, generating economic income for Tunisia. The balance of virtual water flows, generated by production exchanged with other countries and resulting in water consumption, is estimated to be positive for Tunisia at over 4 billion m^3, given the large quantities of cereals imported, implying a net import of virtual water.

Lack of resources and restrictions of drinking water supply

The drinking water service in Tunisia is characterized by good performance, attributable to a social policy pursued in the sector for over forty years. The coverage rate in urban areas is 100%, and 95.3% in rural areas.

However, faced with the prolonged drought, MARHP has taken several measures:

- A quota system for drinking water was introduced in March 2023 to reduce excessive consumption and distribute the deficit across all regions,

- SONEDE temporarily stops supply during the night,

- Some uses of water distributed by SONEDE are prohibited.

SONEDE's water supply difficulties are largely attributable to the lack of resources in dams and autonomous systems such as that of Zaghouan. Access to drinking water in rural areas is high, but coverage varies from one area to another. Although the Tunisian government has implemented policies to improve access to drinking water, notably with the rural drinking water supply program (PAEPR) launched in 2012, some rural areas are still under-supplied, and service is disrupted in other localities.

Aware of the delicacy of the situation, and to avoid a repeat of the difficult moments experienced during the summer, SONEDE is implementing desalination as an alternative solution to meet water needs. The pace of implementation of seawater desalination plant projects was accelerated in 2023, with the aim of commissioning them by summer 2024.

The quest for better water quality in Tunisia has led citizens to resort to bottled water, to the point that the average consumption of bottled water per person is estimated at 247 liters per year. However, consumption has slightly declined, due to distribution disruptions for some brands whose supply source has been affected by the drought.

Plan achievements: projects aligned with the economic and social development plan and surmountable delays

2023 marks the first year of implementation of the 2023-2025 Economic and Social Development Plan. The plan is based on the major orientations set out in Tunisia's strategic vision for 2035. The plan's activities in the water sector have been developed in harmony with the Water 2050 strategy, the NDC, Water REUSE, etc. The overall aim is to adapt to current challenges and implement a model based on better use of resources.

The ESD action plan focuses on improving governance through regulatory and institutional reforms. It focuses on mobilizing water resources, preserving resources and improving the supply of drinking water. It is presented as a project to promote effective IWRM, with the development of non-conventional water use and water saving. The plan contributes to enhancing the value of irrigated perimeters and intensifying their use. It also aims to create favorable conditions for adaptation to climate change. The ESDP 2023-2025 aims to preserve water quality and the environment in general and supports the water-energy-food nexus approach through activities to promote renewable energy and energy management.

From the perspective of accomplishments in 2023, several key developments stand out:

For the implementation of major ongoing projects in the fields of water development, drinking water, sanitation and pollution control: These are projects that are in line with the PDES and that started well before the plan. These projects, which take a long time to complete, are experiencing delays. In fact, delays in implementation are a recurring phenomenon affecting various sectors, including the water sector. They are caused by a combination of factors, including land tenure problems, complex regulations and procedures, lack of coordination, ...

The consequences are economic losses, infrastructure degradation, a slowdown in the country's economic growth, and a loss of public confidence in public institutions. But the situation can be overcome. For project implementation, it is essential to simplify procedures, improve coordination and strengthen resources.

For new projects: new projects are included in the plan, such as the creation of new PPIs using Treated Wastewater, which are currently seeking funding. This state of progress, together with the complexity of the procedures involved, means that they cannot be implemented during the plan, but their launch would be a positive outcome.

Total expenditure under the GBO's water program (program 3) in 2023 amounted to 567 million Dinars out of a budget of 565 MD. This represents a reduction of 25 MD compared with 2022.

Governance

After 2022, when no progress was made on the new Water Code project, the file was resumed in 2023, and a new version was discussed at a Council of Ministers meeting.

In the absence of promulgation of the new Water Code, institutional reorganization measures were not initiated in 2023. In fact, these structural measures, which should profoundly modify the mode of governance, have been included in the draft of the new Code and therefore remain dependent on its promulgation. These measures include the restructuring of “Groupements de Développement Agricole” (GDAs). The management performance of GDAs is still often considered mediocre. The reasons for poor performance are often specific to each GDA, and the sticking points relate to the varying capacities of stakeholders to collectively manage issues, which differ from one GDA to another. Water shortages and the application of irrigation quotas further complicate the situation.

Weaknesses in water governance are not limited to GDA management. They also concern non-compliance with the regulations in force, with a lack of follow-up on violations of the DPH and

unauthorized water abstraction. In fact, as an indication, reports of infringements revealed 5082 violations (collected at the BIRH level, not including infringements directly transmitted by the CRDAs to the regional courts), but only 350 cases had been received by the courts, hence the significant gap between infringements and their judicial processing.

Current water tariffs are unable to cover costs: 90% for SONEDE including fixed charges and 70% without, and 69.4% for ONAS. For irrigation, this rate varies from one CRDA to another, generally ranging from 52% to 87% depending on the perimeter. Irrigation water bill collection rates and the indebtedness of the contracting parties to each other are on the increase: Subscriber/GDA and consequently GDA/CRDA. The amount owed to the CRDA increased by 2 MD in 2023. Resource scarcity and the application of quotas are putting a strain on an already precarious situation; the prospect of applying/upgrading irrigation tariffs to cover costs cannot currently be envisaged without re-establishing access to the service enabling farmers to produce under profitable conditions.

The integration of climate change adaptation into action planning reflects a proactive approach to managing the impacts of CC. By focusing on desalination, circular economy practices, and resource efficiency, these strategies aim to create a sustainable and resilient future for water, energy, and food systems. Since 2018 Tunisia has been implementing its national adaptation plan for food security, which consolidates the agricultural component of Eau 2050 and will guide agricultural policy in the coming years.

MARHP departments are working with technical and financial partners to support the implementation of reforms. Local and national water management tools are being developed. These include management plans for overexploited aquifers, to provide tools for local governance of these aquifers. In addition, the partial updating of the agricultural map, which should be correlated in the near future with the water resources map (CRET) and extended to the whole country, will enable it to be enhanced with the implementation of a water resources planning and management system.

Need for energy transition and use of unconventional water sources

In Tunisia, climate change is likely to exacerbate an already critical situation of water stress. The Water 2050 vision considers non-conventional water as a resource in its own right to ensure water and food security.

Reuse of treated wastewater:

As part of the adaptation strategy, a national master plan for the REUSE of treated wastewater (REUT) has been drawn up. The aim is to develop a shared vision and a long-term strategy for the development and sustainable management of treated wastewater, and to valorize this resource for various purposes, while guiding public policies and future investments in this sector.

The plan calls for the creation of 10,000 ha of PPI by 2030, and larger areas by 2050. This development would go hand in hand with the development of sanitation and the improvement of TME quality through additional treatment. It would enable the rate of connection to the public sewerage network to rise from 65% in 2023 to 70% in 2030, and consequently growth from 293 million m^3 of TME to 373 and energy consumption by ONAS from 138 Gwh to 240 Gwh in 2030. There would therefore be a significant increase in energy consumption, which would have a considerable impact on expenses and costs.

To prepare for this scenario, ONAS has drawn up an energy efficiency program to optimize energy consumption in wastewater treatment plants (WWTPs) through the use of innovative energy optimization technologies and equipment.

Investment measures include reducing energy consumption by installing energy-saving aeration systems and producing energy from biogas or photovoltaic installations.

Desalination development:
Desalination has become an unavoidable source of water to meet the growing needs of the population. It has become essential as conventional resources are becoming increasingly scarce.
Current seawater desalination capacity is 50,000 m^3/d. This capacity is set to rise to 775,000 m^3/d by 2035.
SONEDE's energy bill rose by 10% between 2022 and 2023, reaching 172 million dinars in 2023. The company estimates that its energy consumption will increase from 563 Gwh in 2023 to 1,000 in 2030. The investment and operating costs of energy-intensive desalination plants will weigh heavily on the cost price of water. By 2030, the energy portion of SONEDE's water cost price will reach 35%, further undermining the company's financial equilibrium. This situation will be exacerbated by rising electricity prices.
To solve this problem, SONEDE has drawn up an energy transition strategy. This involves implementing the best technologies for energy efficiency, smart water networks and renewable energy projects. The aim of these projects is to reduce energy consumption in terms of both physical quantities and costs, with the best possible economic and financial return on invested capital. The strategy also aims to preserve the environment and mitigate climate change by reducing greenhouse gas emissions.

In short, the massive use of non-conventional water to ensure water security would lead to a very significant increase in energy consumption and operating costs for both ONAS and SONEDE. It is therefore essential that this orientation be accompanied by an energy transition. The projects of these two organizations are strategic opportunities that will make it possible to limit the influence of energy costs on the cost price in the future. However, their implementation requires relatively substantial funding, and raises major challenges in terms of project design, technology and operation.

Scientific research in the water sector: encouraging and useful results

The many projects carried out by IRESA integrate environmental, social and economic dimensions and cover a broad spectrum of themes.

The IRESA system's flagship institutions, involved in research and development projects focusing on water and climate change, include INGREF, INAT, IRA and ESIM.

Funding for these projects is provided by various national and international donors. The Ministry of Higher Education and Scientific Research (MESRS) is the main contributor, with 25% of funding.

In the water sector, the themes of IRESA's projects revolve mainly around the three main thrusts of the “Water 2050” strategy, namely: IWRM and food security, Water quality and ecosystem preservation, Water-food-energy Nexus.

These projects aim to improve irrigation efficiency, improve the quality of treated wastewater, encourage its reuse, promote participatory water resource management and design decision-support tools for integrated management.

The results of these projects are encouraging. They have led to the development of new knowledge, innovative tools and capacity-building for local players.

Despite the progress made, many challenges remain in the management, capitalization, extension and dissemination of the results of these projects, limiting the scope of their impact.

To enhance the impact of research in the field, IRESA recommends strengthening tools for disseminating and communicating project results, reinforcing coordination between the various players, increasing research funding, and developing monitoring and evaluation tools.

Integrating new technologies to meet future developments

The integration of new technologies in the water sector aims to improve water efficiency, reduce consumption and promote sustainability in Tunisia's water sector. These new technological solutions

therefore need to be rapidly developed and implemented, enabling solutions to be envisaged to meet the problems experienced and the evolutions of the years to come, in line with strategic orientations.

Wastewater treatment processes to enable the recycling and reuse of water in both industry and agriculture, and to reduce operational and energy costs, is an important theme given the focus on the REUSE of TMEs.

The same applies to technologies for improving and promoting water resource efficiency and energy efficiency in irrigation to cope with water stress. The appropriation of these new technologies is increasingly evident in the field of “smart irrigation” in the face of dwindling water resources for crops; several Tunisian green start-ups are very successful in this field.

Drinking water distribution is set to follow suit and modernize in areas such as smart metering, which enables the volume of water consumed to be recorded and information transmitted via a communications network.

To this end, SONEDE has been implementing a geographic information system (GIS) since 2018. The implementation of the GIS enables the company to initiate its digital transformation, and to respond to the main issues linked to the management of its services. Expectations include digitizing all water networks and equipping them with meters and other communicating sensors.

Communication, outreach and professional training

AVFA continues to strengthen its activities in the field of sustainable water management in agriculture, in its various areas of intervention: extension, training and mass communication. The range of themes is expanding, with the development of awareness-raising days and the training of trainers on intelligent irrigation, irrigation using TMEs, the equipping or reorganization of training centers to introduce innovative practices such as hydroponics, but also agroecology, the application of the water-energy nexus concept and the use of solar energy.

The range of training courses for young people is also diversifying, often in partnership with professionals, for training modules in irrigation management, pump repair/maintenance, etc. The Barouta sectoral agricultural training center (Kairouan), specialized in the installation of irrigated perimeters, should soon see its vocation as a future center for water-related professions consolidated.

The fact remains, however, that far-reaching institutional communication is still not enough to support demand management at the level of user behavior. Efforts should be made by all players in the sector to run awareness campaigns throughout the year, not just in summer.

Findings in brief:

The year 2023 was characterized by drought, high temperatures and a lack of water resources. Tunisia was able to cope with this situation in terms of drinking water supply by taking a few restrictive measures, unlike irrigation, which was very poorly supplied.

The year's achievements generally fall within the scope of implementation of the 2023-2025 Economic and Social Development Plan, which in turn constitutes the 1st plan of the Water 2050 strategy. These are mainly ongoing infrastructure projects, which have taken a very long time to complete. Some projects, such as the Zarat and Sfax seawater desalination plants, made remarkable progress in 2023.

The indicator targets expected in the ESDP 2023-2025 are well on the way to being achieved (or have already been achieved), such as water conservation, drinking water supply and communal sanitation; however, it should be borne in mind that these indicators alone do not reflect reality in terms of sufficient availability of quality drinking water for all citizens, or irrigation efficiency.

Several projects are underway to meet the plan's expectations in terms of combating illicit drilling, water and soil conservation, green water development and agroecology. These projects will need to be the subject of a national operational strategy or plan to ensure their multiplication, in complementarity with Water 2050.

Deviations from the ESDP 2023-2025 forecasts mainly concern the expected reforms, which depend on the promulgation of the future new water code. Other measures, particularly in support of demand management, inclusive development or monitoring, such as the implementation of a national communication strategy, rural sanitation in clusters of less than 3,000 inhabitants, the development of measurement networks, early warning and flood reporting systems, etc., are not yet underway.

If we refer to the measures recommended in the Water 2050 vision, in order to achieve hydraulic balance by 2050, the priority projects and actions are obviously highlighted if we compare these measures with observed performance, as well as the interactions between these measures to ensure both water and food security, i.e.:

- **Securing drinking water, primarily by rehabilitating water supply networks and extending desalination plants, as a "sensible" solution for the short term, coupled with the acceleration of energy management/energy transition projects,**
- **The acceleration of REUSE in its various stages, treatment/transfer and recovery,**
- **Combating violations of the DPH (illegal drilling, illegal pumping on wadis, theft through illegal connections),**
- **To these should be added the implementation of an agricultural policy, giving priority to the valuation of green water, the stabilization of irrigated areas, and agricultural REUSE in dedicated PPI but also by substitution for conventional water in PPI suffering from a shortage of conventional water.**

The strengths of Tunisia's water sector in brief:

- A structured institutional and organizational framework, present in all governorates and regions,
- A water code to preserve the resource; the new version of which, awaiting promulgation, will enable the sector to meet the challenges facing the sector today,
- A coherent strategic framework, integrating sectoral strategies, in particular Water 2050, CDN and the ecological transition strategy, promoting a decompartmentalization of actions between Ministries,
- An impressive hydraulic infrastructure for mobilizing water resources, with interconnected dams,
- A drinking water distribution and treatment infrastructure with very high coverage rates,
- Extensive public and private irrigation schemes throughout the country,
- Water-saving measures implemented in irrigated areas, and GDAs trained to provide distribution services,
- An extensive wastewater collection and treatment infrastructure in urban areas, with 127 wastewater treatment plants nationwide, with a total treatment capacity of around 1 million m^3/d,
- Wide-ranging programs to combat water pollution and protect the environment,
- Major investment programs in the water sector, in all its various aspects, with technical and financial partners, supporting the continued implementation of major projects for transfer mobilization, hydro-agricultural development, drinking water, desalination and sanitation,
- Long-term, progressively enriched databases/documentation/studies on surface and groundwater,
- Teaching and research facilities in the field of water and agriculture, capable of developing cutting-edge innovations for the sector,

- Expertise and development of know-how in several fields: hydraulics, CES, groundwater recharge, etc.

Brief overview of recurring weaknesses

- Poorly distributed surface water resources with severe geographical and climatic constraints,
- Frequency of successive dry years leading to high water stress and increasing water shortages,
- Resources threatened by salinity and nitrate concentration,
- Excessive and unauthorized exploitation of groundwater and increasing number of violations of the DPH,
- Environmental infringements causing pollution, with non-compliant water discharges and uncontrolled disposal of solid waste, margines and other pollutants,
- Partially silted-up dam reservoirs,
- Degradation of distribution infrastructure, resulting in considerable water losses,
- Low rate of intensification in irrigated farming, affecting the profitability of high-cost hydraulic investments,
- Operating structures fail to cover the cost of water, resulting in financial imbalance and compromised performance,
- Lack of exploitation of TMEs even in periods of conventional water shortage; and quality of TMEs to be improved,
- Delays in implementing regulatory and institutional reforms to improve sector governance,
- Lack of an operational, reliable and sufficiently comprehensive information system on the various aspects of water.

Opportunities for the coming years:

- Completion of the process of adopting the “Water Code” for better governance of the sector,
- Implementation of the action plans resulting from the Water 2050 study,
- Investment opportunities and cooperation with technical and financial partners,
- The possibility of joint management of surface and groundwater resources between wet and dry events, with new hydraulic developments,
- The reuse of treated wastewater and the development of desalination, which are the focus of major programs,
- Modernization and rehabilitation of hydraulic equipment to improve efficiency,
- There is still considerable scope for progress in water saving, with technological innovations in irrigated perimeters, particularly for piloting, increasingly disseminated and adopted by farmers,
- The implementation of energy transition strategies by operators, particularly solar energy: an opportunity to reduce the cost of water,
- Improving the quality of drinking water through the implementation of cooperative health safety management plans, including the harmonization of water quality monitoring, between SONEDE, the GR and INSSPA,
- The strengthening of sanitation in rural communal areas and the development of a rural sanitation support programme for dispersed housing,
- Improvement of the technical and management performance of facilities (drinking water, irrigation, sanitation) through the participation of the private sector,
- The consolidation and development of a research, higher education and vocational training system, to support its opportunities in terms of human resources development capable of ensuring this multifaceted transition to have sufficient and quality water resources for its various uses.

Summary of data and indicators for the water sector in Tunisia (2023)

	Designations	Unit	2020	2021	2022	2023
I.1	Area of Tunisia	Km2	163 610	163 610	163 610	163 610
I.2	Urban population	1000 Hab	8 044,4	8 058,7	8106,2	8129,2
I.3	Rural population	1000 Hab	3 740,6	3 744,9	3763,1	3774,8
I.4	Total population	1000 Hab	11 785,0	11 803,6	11869,3	11903,8
I.5	Average rainfall across the country	mm	218	172	139	164
I.6	Average summer temperature	°C		29,95	29,80	29,2
I.7	Maximum annual reference evapotranspiration	mm	2341	2700	2695	2560
I.8	Minimum annual reference evapotranspiration	mm	1236	1136	1240	1340
I.9	Volume of water evaporated from dams	Mm^3	-	142	137	121
II.1	Surface resources: inflows to dams	Mm^3	791	804	1109	694
II.2	% of annual inflows to dams / average annual inflows	%	44	43	59	**38**
II.3	Underground resources	Mm3	2201	2198	2202	2412*
II.4	Rate of surface water mobilization	%	92	92	92	92
III.1	Number of dams	Unit	37	37	37	37
III.2	Number of hill dams	Unit	258	258	258	258
III.3	Number of hill lakes	Unit	918	922	925	925
III.4	Total irrigated area	1000 Ha	440	441	442	442,5
III.5	Total surface area public irrigation area/perimeters (PPI)	1000 Ha	248	249	250	250,5
III.6	% of surface area of PI equipped with water-saving equipment	%	94,5	94,7	95,2	96,5
III.7	Area developed for PI from TWWs (treated wastewater)	1000 Ha	7,584	7,584	7,590	7,879
III.8	Area actually irrigated using TWWs	1000 Ha	2450	2425	2725	2577
IV.1	Agricultural abstraction (freshwater)	Mm3	2710	2722	2782	**2836,3**
IV.2	Withdrawal for drinking water (Domestic)	Mm3	802	827.29	855,68	783,1
IV.3	Withdrawal for Industry	Mm3	61,9	60.62	65,82	80
IV.4	Withdrawal for tourism and other	Mm3	13,5	10.09	33,34	15,5
IV.5	Use of treated wastewater in irrigation	Mm3	12,2	14,37	19,3	**10**
IV.6	% of wastewater treated in agriculture	%	5,1%	4,9%	6,6 %	**3,4 %**
V.1	2020 directory: Number of surface wells equipped	Unit	115001	115001	115001	114294
V.2	2020 directory: Exploitation of groundwater	Mm3	914	914	914	909
V.3	2020 directory: Groundwater exploitation rate **	%	119	119	119	nd
V.4	Total number of water points on deep aquifers	Unit	35428	41142	44444	48762
V.5	Number of authorized water points	Unit	14149	14801	15181	16187
V.6	Number of unauthorized water points	Unit	21279	26341	29263	32575
V.7	Exploitation of deep aquifers	Mm3	1904	2084	2144	**2299**
V.8	Exploitation rate of deep aquifers **	%	133	145,6	149,7	nd
V.9	Total exploitation of underground resources	Mm3	2818	2998	3069	3203*

V.10	Exploitation rate of underground resources	%	128	136	139	133
V.11	Volume of water artificially recharged	Mm3		41.74	40	0
VI.1	Number of AEP GDAs	Unit	1369	1330	1399	1382
VI.2	Number of PI GDAs	Unit	1240	1229	1215	1253
VI.3	Number of mixed GDAs	Unit	125	129	118	121
VI.4	Total number of GDAs	Unit	2734	2688	2732	2750
VII.1	Expenditure booked according to TBM for P3	million D	590,398	465,367	537,733	565,288
VII.2	TBM expenditure for P3	million D	672,835	470,995	589,970	566,895
VII.3	Rate of GBO expenditure for P3	%	114	101	110	99,72
	AEP by SONEDE					
VIII.1	Total number of subscribers	million	3,038	3,121	3,182	3,257
VIII.2	Urban population supplied with drinking water	million	8,044	8,058	8,106	8,129
VIII.3	Urban coverage rate	%	100	100	100	100
	AEP Rural area (SONEDE + GR)					
IX.1	Rural population served by SONEDE	million	1,998	2,010	2,038	2,060
IX.2	Coverage rate in rural areas SONEDE	%	53,4	53,7	54,2	54,6
IX.3	Rural population served by par GR	million	1,546	1,548	1,556	1537,7
IX.4	Coverage rate in rural areas GR	%	41,3	41,3	41,4	40,7
IX.5	Coverage rate in rural areas (GR + SONEDE)	%	94,7	95	95,5	**95,3**
	AEP Global (Urban + Rural areas)					
IX.6	Total population supplied with drinking water	million	11,588	11,616	11,700	11,726
IX.7	Overall coverage rate	%	98,3	98,4	98,6	98,5
	X.SONEDE					
X.1	Number of treatment stations	Unit	19	19	19	19
X.2	Number of seawater desalination stations	Unit	1	1	1	1
X.3	Number of brackish-water desalination plants	Unit	15	15	15	15
X.4	Network length	km	56561	57314	58001	58546
X.5	Water production: total volume produced	Mm3	759,1	779,9	806,6	**773,3**
X.6	Brackish water and desalinated seawater	Mm3	42,7	42,4	41,3	45,8
X.7	Total volume consumed	Mm3	494,3	511,8	537	516
X.8	Volume consumed/hab/ day	l/hab/jour	122,9	123,2	125,9	122,3
X.9	Average rate/m^3 (including fixed charge)	D/m3	0,765	0,914	0,966	1,079
X.10	Average cost perm^3	D/m3	1,224	1,302	1,346	1,550
X.11	Overall network efficiency (supply and distribution)	%	67,7	67,5	66,6	67,4
X.12	Medium voltage energy consumption	GWH	516	525	539,03	**562,9**
	X. SECADENORD					
X.13	Total volume billed	Mm3	478,5	467	456	403

X.14		Volume delivered to SONEDE	Mm3	372	389,2	406,1	380
X.15		Volume delivered to CRDA	Mm3	106,5	77,5	50	**23**
X.16		Energy consumption	GWh	127,6	128	116,3	**162,4**
X.17		Energy consumption cost	MDT	31,1	31,2	34,3	**53,3**
	X. ONAS						
X.18		Number of wastewater treatment plants	Unit	123	124	125	127
X.19		Network length	Km	17729	17877	17981	18243
X.20		Number of municipalities covered	Unit	193	193	193	197
X.21		Number of subscribers	million	2,125	2,160	2,200	2,253
X.22		Rate of connection to the public sewerage network	%	63	63,2	64,9	65,4
X.23		Volume of wastewater (produced) VEUP	Mm3	325	321	321	317,7
X.24		Volume of wastewater collected VEUC	Mm3	289,4	289,4	293,2	296
X.25		Volume of treated wastewater VEUT	Mm3	287	288,5	292	293
X.26		% of wastewater treated (VEUT/VEUP)	%	88,3	89,7	91	92,2
X.27		Energy consumption for treatment and pumping	GWh	126	121,7	127,5	138,28
	Water pollution control (ANPE)						
XI.1		Number of control points	Unit	340	390	404	434
XI.2		Number of water pollution control operations	Unit	3 284	4445	4991	4884
XI.3		Number of official reports of non-compliance or infringements	Unit	638	714	756	642
	Health inspection of drinking water distributed by SONEDE (DHMPE + INSSPA)						
XI.4		Number of free chlorine residual tests	Unit	287797	253944	252572	6598
XI.5		Number of bacteriological analyses	Unit	31579	31670	35948	118
XI.6		Bacteriological non-compliance rate	%	10,1	10,6	11,4	**13,6**

* The CRET project has presented a new definition of exploitable resources, which corresponds to the volume of water that it is economically possible to extract in a given area and over a given period, taking into account environmental, social, economic and political factors.
Thus, exploitable water resources are estimated at 2412 Mm³/year by the CRET project, while the D.G.R.E.'s deep and phreatic water table exploitation directories indicate a volume of 2202 Mm³/year up to 2022 for renewable resources allocated to the whole country.

Rapport National du secteur de l'Eau 2023

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