Egypt’s Water and Sanitation Sector: Water Solutions for Future Water Challenges
### Water Conservation Plan for Managing Water Scarcity and Sustainability for the Utilities Sector

| **Pillar 1:** Alternative sources of drinking water | 1. Surface water (Nile River)  
2. Desalination water in Coastal Governorates.  
3. Ground water. |
|---|---|
| **Pillar 2:** Safe reuse of treated wastewater | 1. Expansion of the establishment of Wastewater treatment plants, raising the efficiency of existing treatment plants, and improving the quality of treated wastewater allowing for mixing and reuse in agriculture.  
2. Agriculture drainage wastewater treatment for irrigation (El Mahsama and Bahr El Bakar-El Hamam ‘ongoing”).  
3. Expansion of the National Rural Sanitation Program. |
| **Pillar 3:** Reduction of NRW | 1. Expansion in installation of household water meters (Prepaid- smart)  
2. Decrease the losses in potable water networks.  
3. Use of water saving fittings.  
4. Media awareness plans for water conservation. |
Pillar #1

Alternative sources of drinking water
Desalination
✓ Till 2014: 36 desalination plant were implemented with capacity 84,000 m³/day.

✓ In 2023:

- 99 desalination plant were implemented with capacity 1.21 million m³/day.
- 11 desalination plant are ongoing with capacity 228,000 m³/day to reach 110 desalination plants with a capacity of 1.44 million m³/day
Ministry of Housing, Utilities, and Urban Communities has developed the Strategic Plan for Desalination to cover the seawater desalination for providing drinking water needs from till 2050 with total capacity 8.89 million m³/d in 11 Gov.

The 1st five-year desalination plan covered implementation of 21 DTP with a capacity of 3.4 M m³/day extended to 6 M m³/day.

Main governorates (4 Gov.) that relying on desalinated water (Matrouh - Red Sea – North Sinai - South Sinai)

New governorates (7 Gov.) will be relying on desalinated water (Suez – Ismailia – Port Said – Dakahlia – Kafr El Sheikh – El Beheira – Alexandria)
Pillar #2

Safe reuse of treated wastewater
Expansion of the establishment of **Wastewater treatment plants**, improve the efficiency of existing treatment plants, and improving the quality of treated wastewater allowing for mixing and reuse in agriculture

<table>
<thead>
<tr>
<th>Completed WWTPs</th>
<th>Ongoing WWTPs</th>
<th>Total (Completed and ongoing)</th>
</tr>
</thead>
<tbody>
<tr>
<td>560 WWTPs (secondary &amp; Tertiary)</td>
<td>305 WWTPs (secondary &amp; Tertiary)</td>
<td><strong>865 WWTPs (secondary &amp; Tertiary)</strong></td>
</tr>
<tr>
<td>Total capacities <strong>18 million m³/day</strong></td>
<td>Total capacities <strong>4.5 million m³/day</strong></td>
<td><strong>Total capacities about 22.5 million m³/day</strong></td>
</tr>
</tbody>
</table>
Projects Pipeline for PPP

- The third phase of the West WWTP in 6th of October, with a capacity of 150,000 m³/day (NUCA)
- The first phase of the industrial WWTP in Sadat, with a capacity of 100,000 m³/day (NUCA)
- The first phase of the industrial WWTP in New Beni Suef, with a capacity of 25,000 m³/day (NUCA)
- The first phase of the industrial WWTP in New Mansoura, with a capacity of 10,000 m³/day (NUCA)
- Extension of Zenien WWTP in Giza, with a capacity of 100,000 m³/day to reach 0.5 M m³/day. (CAPW)
Extension of Rashed WWTP in Beheira, with a capacity of 40,000 m³/day to reach 60,000 m³/day. (HCWW)

Extension of Sarabioum WWTP in Ismailia, with a capacity of 70,000 m³/day to reach 205,000 m³/day. (HCWW)
A Presidential program has been launched for the Integration Development for Rural Egypt (HAYAH KARIMA INITIATIVE) in order to provide a decent life for the citizens nationwide by improving the quality of life and services for rural areas and achieving the sustainable development for all districts nationwide.

Implemented by (MHUUC – Engineering Authority)

The Initiative Targeting:

- **Governorates**: 20
- **Districts**: 175
- **Villages**: 4,500
- **Satellites**: 29,500
- **Beneficiaries**: 58 Million
Sludge Management and Utilization

- Maximizing the safe reuse of sludge through different projects.
- Achieving the sustainable development goals of the United Nations related to energy, sustainability and environments concerning good health and wellbeing, water and sanitation, clean and affordable energy, sustainable cities and communities, responsible consumption and production and climate action.
- Efficient use of biogas from Sludge Anaerobic Digestion is a potential operational cost recovery.
- The promotion of green sustainable source of energy through reducing climate change impacts.
✓ El Gabal Al-Asfar WWTP with a capacity of 2.5 million m\(^3\)/day, and seeking to be extended to 3.5 million m\(^3\)/day, this project is a typical project for sewage sludge management to generate biogas/energy starting with targeting 50% energy recovery at Stage I, the figure was raised to 65% at Stage II and again ambitious goal of reaching 80% energy recovery was aimed at Stage III.

✓ Alex East WWTP with a capacity of 800,000 m\(^3\)/day, was rehabilitated and added sludge digestion to decrease the sludge environmental impacts by decreasing the sludge disposal by 30% and to provide 50% of the power needed the whole plant.

✓ **On tendering process**, Alex West WWTP that targeting to reach a capacity of 630,000 m\(^3\)/day with anaerobic digestion for the total produced sludge will be implemented.
There are also other projects planned to benefit from the utilization of sludge, such as:

- Sludge produced from Abu Rawash and Zenen WWTPs for the existing WWTPs and ongoing extension to reach 2.5 M m³/day. (CAPW)

- Sludge produced from Tanta WWTP for the existing WWTP and ongoing extension to reach 190,000 m³/day. (HCWW)
Drainage Wastewater Treatment & Reuse Projects (For Irrigation)

Construction Completed

- **Baher El Bakar treatment plant**
  - Total capacity: 5.6 million m³/d
  - Awarded 3 Guinness world records certificates

- **Mahsama treatment plant**
  - Total capacity: 1 million m³/d
  - Awarded the best world water recycling project in 2020

Under Construction

- **El Hamam treatment plant**
  - Total capacity: 7.5 million m³/d

Total will be **14.1 million m³/d**

* To reach 36.6 million m³/d total wastewater to be reused.
Pillar #3

Reduction of NRW
Reduction of NRW

✓ Expansion in installation of household water meters:
   This is including expansion in providing the smart and pre-paid water meters for the new customers and replacement of the non working existing water meters (About 19.16 Million Subscriber)

✓ Use of water saving fittings:
   The saving fittings have been installed in the governmental entities and institutions in cooperation with the Ministry of Military Production and the Arab Organization for Industrialization.
   3.7 million saving fittings were supplied, and 2.9 million were sold and installed.
✓ Decrease the losses in potable water networks:

The water leakage has been reduced from 29.1% in 2017/2018 to 26% today through establishment of District Metered Areas (DMAs) to reduce water leakage.

✓ Media awareness plans for water conservation have been applied through different approaches:

A national campaign to rationalize water consumption, Production of awareness-raising materials, Reducing the informal connections, Development of rationalization technology, Mobile application for drinking water and sanitation services
Challenges
Egypt is currently facing water scarcity and shortage as per the following challenges:

- **Population growth and increase in water demand**
- **Capacity Building for service Providers**
- **Limited water resources**
- **Impact of Climate changes and their effects on ensuring the sustainability of services and maintaining water availability.**
- **The huge investments required to establish drinking water and sewage projects and the high cost of operation and maintenance (Low water Tariff).**
- **Involving the private sector in the growth of the utilities sector and the access of services to all citizens.**