



**Arab Republic of Egypt**

**Ministry of Housing, Utilities, and Urban Communities (MHUUC)**

# **Egypt's Water and Sanitation Sector: Water Solutions for Future Water Challenges**



**KGID** KOREA GREEN INNOVATION DAYS  
CAIRO OCTOBER 17-19, 2023  
LEVELING UP  
GREEN GROWTH IMPACTS



# Water Conservation Plan for Managing Water Scarcity and Sustainability for the Utilities Sector

<b><u>Pillar1:</u></b> <b>Alternative sources of drinking water</b>	<ol style="list-style-type: none"><li>1. Surface water (Nile River)</li><li>2. Desalination water in Coastal Governorates.</li><li>3. Ground water.</li></ol>
<b><u>Pillar 2:</u></b> <b>Safe reuse of treated wastewater</b>	<ol style="list-style-type: none"><li>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 .</li><li>2. Agriculture drainage wastewater treatment for irrigation (El Mahsama and Bahr El Bakar-El Hamam ‘ongoing’).</li><li>3. Expansion of the National Rural Sanitation Program.</li></ol>
<b><u>Pillar 3:</u></b> <b>Reduction of NRW</b>	<ol style="list-style-type: none"><li>1. Expansion in installation of household water meters (Prepaid- smart)</li><li>2. Decrease the losses in potable water networks.</li><li>3. Use of water saving fittings.</li><li>4. Media awareness plans for water conservation.</li></ol>

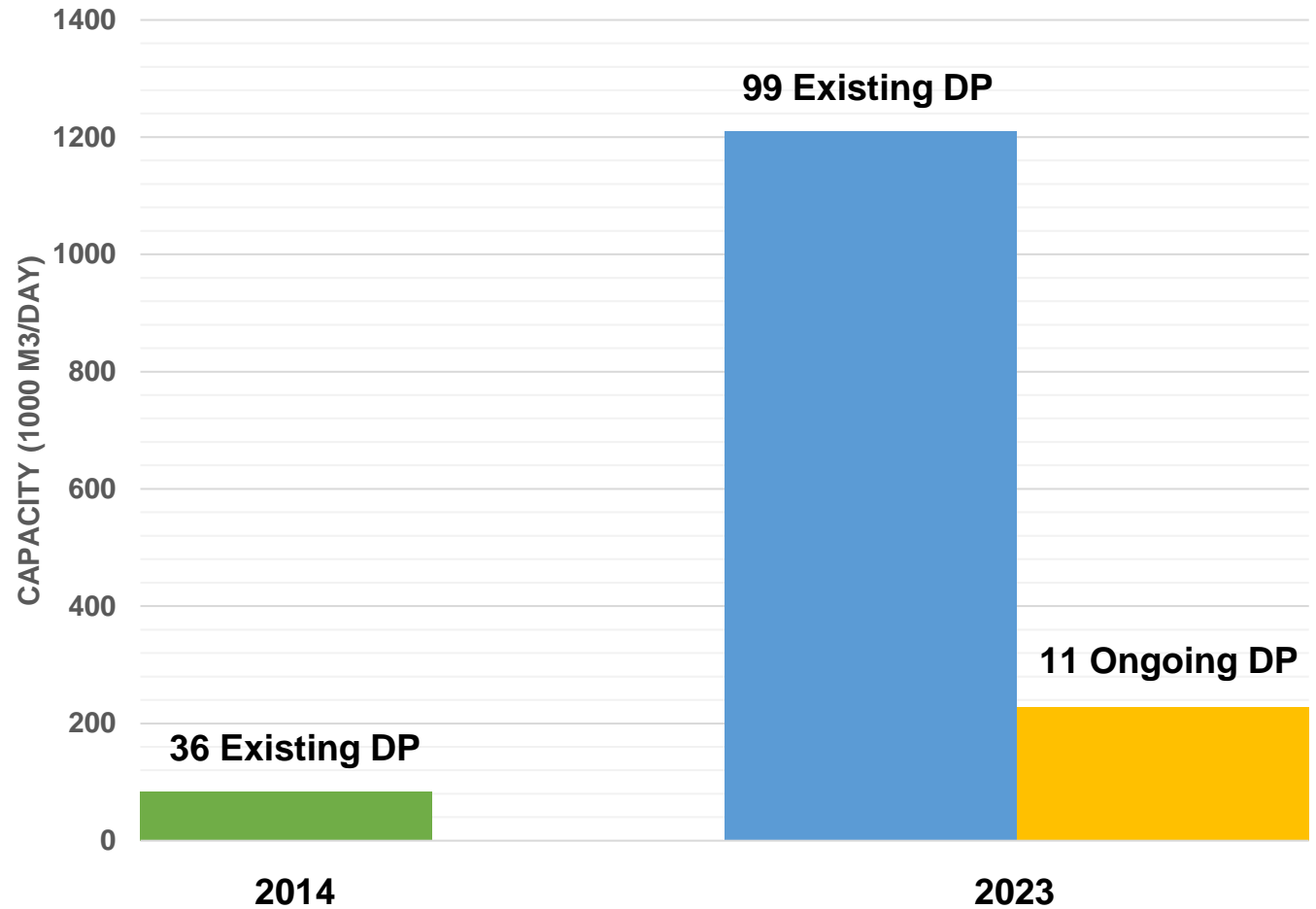
# **Pillar #1**

## **Alternative sources of drinking water**

# Desalination

# Desalination Plants all over Egypt

- ✓ Till **2014**: **36** desalination plant were implemented with capacity **84,000** m<sup>3</sup>/day.
- ✓ In **2023**:
  - **99** desalination plant were implemented with capacity **1.21 million** m<sup>3</sup>/day.
  - **11** desalination plant are ongoing with capacity **228,000** m<sup>3</sup>/day to reach **110** desalination plants with a capacity of **1.44 million** m<sup>3</sup>/day



# Strategic Plan for Desalination till 2050

- 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 m<sup>3</sup>/d** in **11 Gov.**
- The 1st five-year desalination plan covered implementation of **21 DTP** with a capacity of **3.4 M m<sup>3</sup>/day** extended to **6 M m<sup>3</sup>/day**.

1 To provide drinking water needs to meet the current requirements and the future increase of population

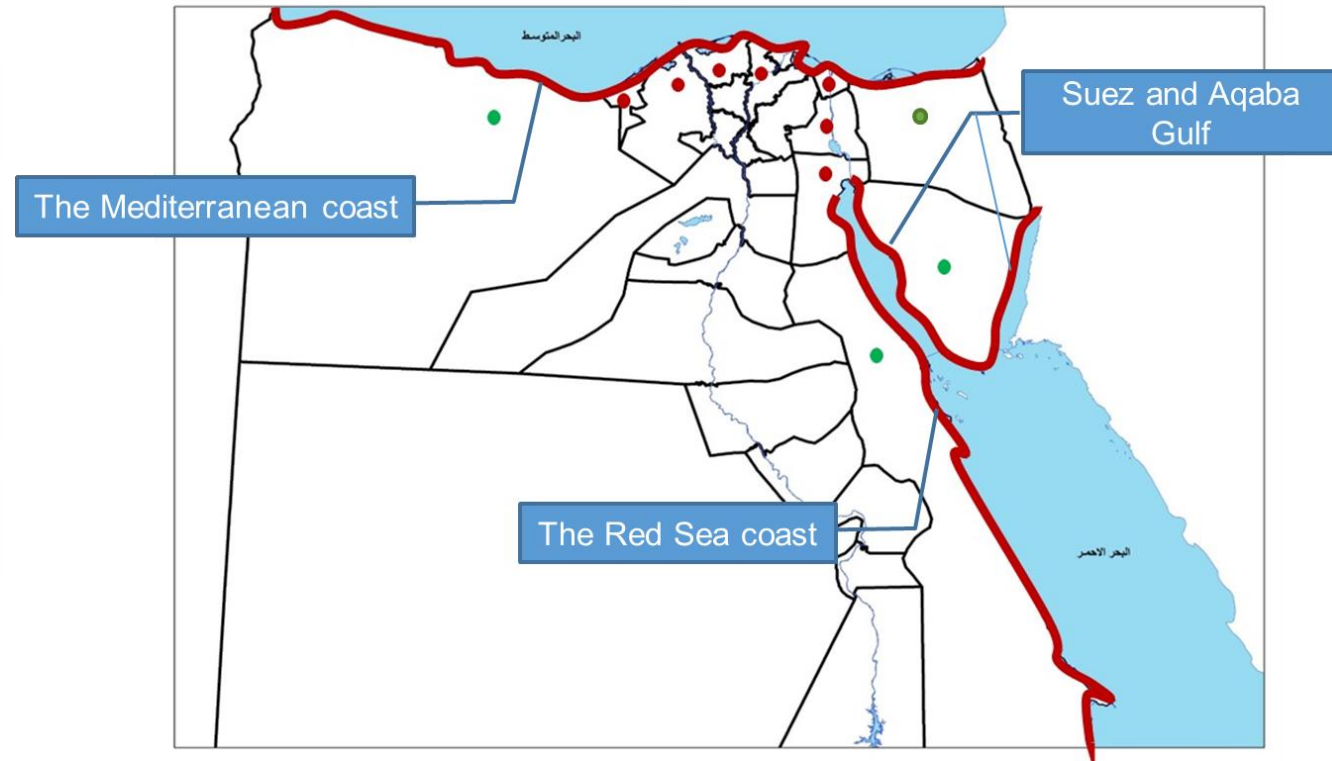
2 To provide drinking water needs to stop long transmission of surface water to governorates (Matrouh - Red Sea – South Sinai)

3 To replace surface water by desalination water in coastal governorates

4 To provide drinking water needs required for new urban development communities

● 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

## Completed WWTPs

**560 WWTPs** (secondary & Tertiary)

Total capacities **18** million m<sup>3</sup>/day

## Ongoing WWTPs including 1<sup>st</sup> phase of Hayah Karima

**305 WWTPs** (secondary & Tertiary)

Total capacities **4.5** million m<sup>3</sup>/day

## Total (Completed and ongoing)

**865 WWTPs** (secondary & Tertiary)

Total capacities **about 22.5** million m<sup>3</sup>/day



# Projects Pipeline for PPP

- ❑ The third phase of the **West WWTP in 6th of October**, with a capacity of **150,000 m<sup>3</sup>/day** (NUCA)
- ❑ The first phase of the **industrial WWTP in Sadat**, with a capacity of **100,000 m<sup>3</sup>/day** (NUCA)
- ❑ The first phase of the **industrial WWTP in New Beni Suef**, with a capacity of **25,000 m<sup>3</sup> / day** (NUCA)
- ❑ The first phase of the **industrial WWTP in New Mansoura**, with a capacity of **10,000 m<sup>3</sup>/day** (NUCA)
- ❑ Extension of **Zenien WWTP** in Giza, with a capacity of **100,000 m<sup>3</sup>/day** to reach **0.5 M m<sup>3</sup>/day**. (CAPW)

# Projects Pipeline for PPP

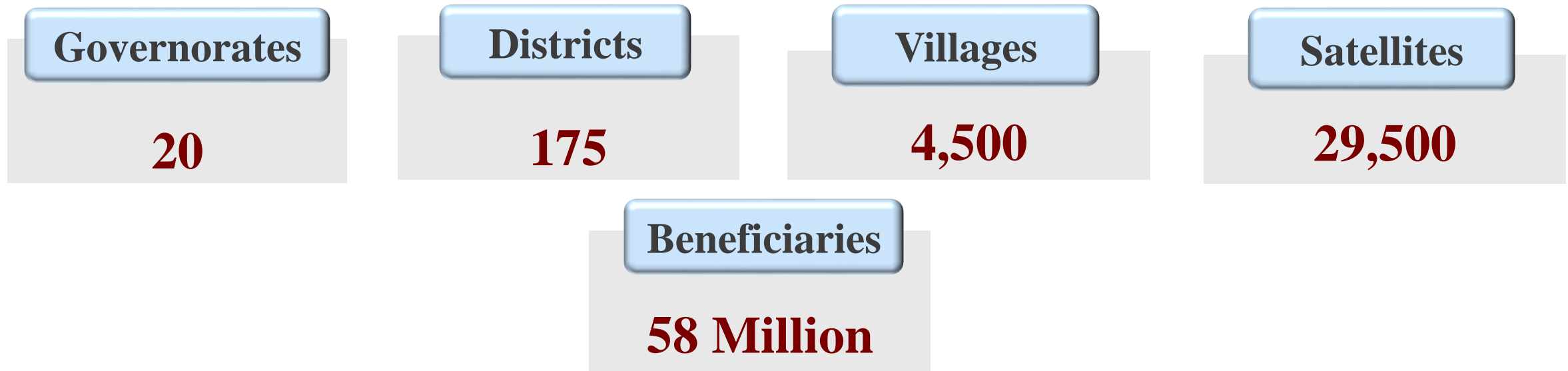
- ❑ Extension of **Rashed WWTP** in Beheira, with a capacity of **40,000 m<sup>3</sup>/day** to reach **60,000 m<sup>3</sup>/day**. (HCWW)
- ❑ Extension of **Saraboum WWTP** in Ismailia, with a capacity of **70,000 m<sup>3</sup>/day** to reach **205,000 m<sup>3</sup>/day**. (HCWW)

# National Integrated Development For Rural Egypt (HAYAH KARIMA)

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:



# 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**.

# Sludge Management and Utilization – Existing sludge projects

- ✓ El Gabal Al-Asfar WWTP with a capacity of **2.5** million m<sup>3</sup>/day, and seeking to be extended to **3.5** million m<sup>3</sup>/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<sup>3</sup>/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<sup>3</sup>/day with anaerobic digestion for the total produced sludge will be implemented.



# Projects Pipeline for PPP

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 on going extension to reach **2.5 M m<sup>3</sup>/day**. [\(CAPW\)](#)
- ❑ Sludge produced from Tanta WWTP for the existing WWTP and on going extension to reach **190,000 m<sup>3</sup>/day**. [\(HCWW\)](#)



# Drainage Wastewater Treatment & Reuse Projects (For Irrigation)

## Construction Completed

**Baher El Bakar treatment plant**

Total capacity  
**5.6** million m<sup>3</sup>/d

awarded **3** Guinness world records certificates

**Mahsama treatment plant**

Total capacity  
**1** million m<sup>3</sup>/d

awarded the best world water recycling project in 2020

## Under Construction

**El Hamam treatment plant**

Total capacity  
**7.5** million m<sup>3</sup>/d

**Total will be 14.1 million m<sup>3</sup>/d**

\* To reach **36.6 million m<sup>3</sup>/d** total wastewater to be reused.



## **Pillar #3**

### **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;

The **huge investments** required to establish drinking water and sewage projects and the **high cost of operation and maintenance** (Low water Tariff).

Impact of **Climate changes** and their effects on ensuring the **sustainability of services** and maintaining water availability.

**Involving the private sector** in the growth of the utilities sector and the access of services to all citizens.