



# The Future of Wastewater Treatment and Reuse in Kingdom of Saudi Arabia

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# Acknowledgment

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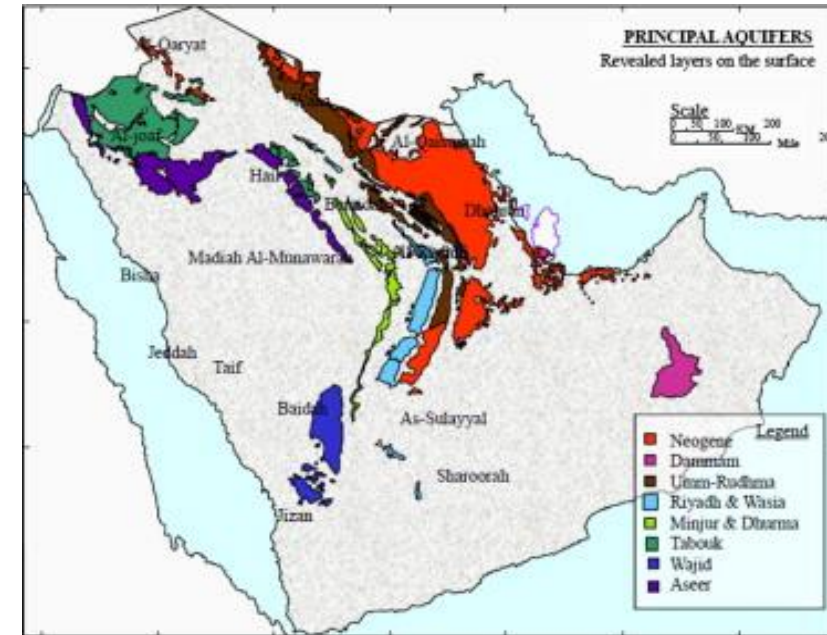
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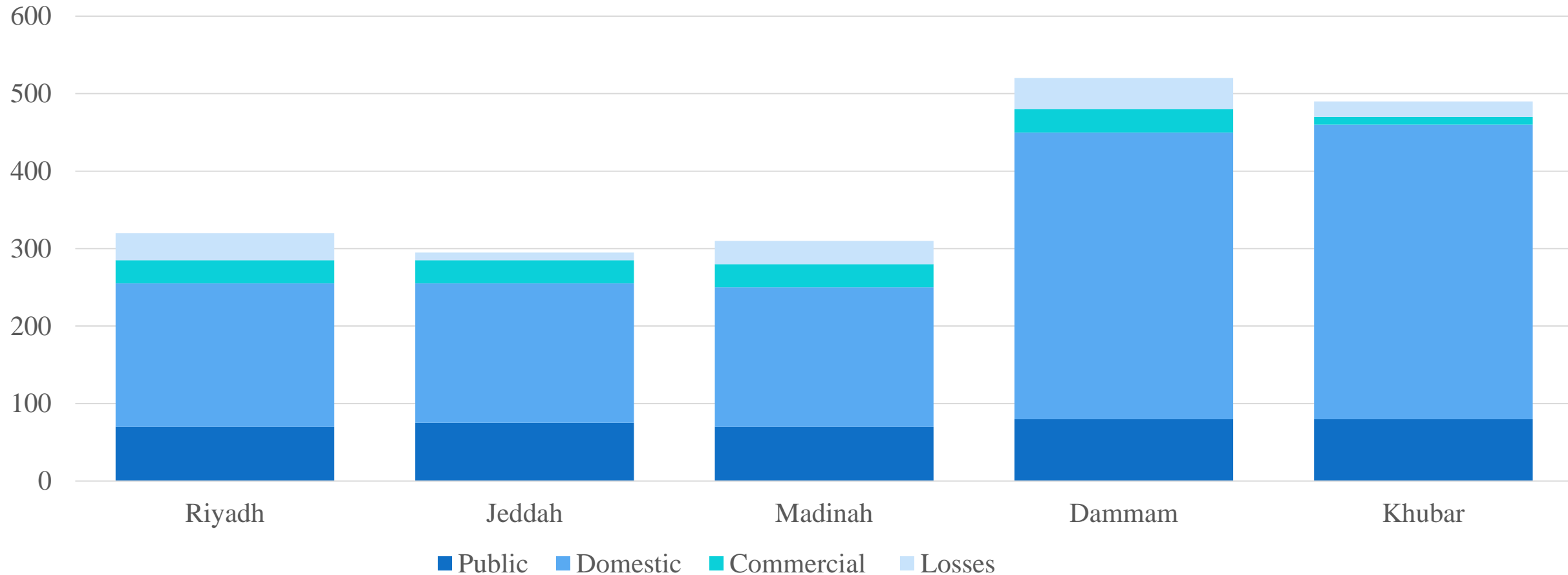
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# Water Resources in KSA (million m<sup>3</sup>/year)

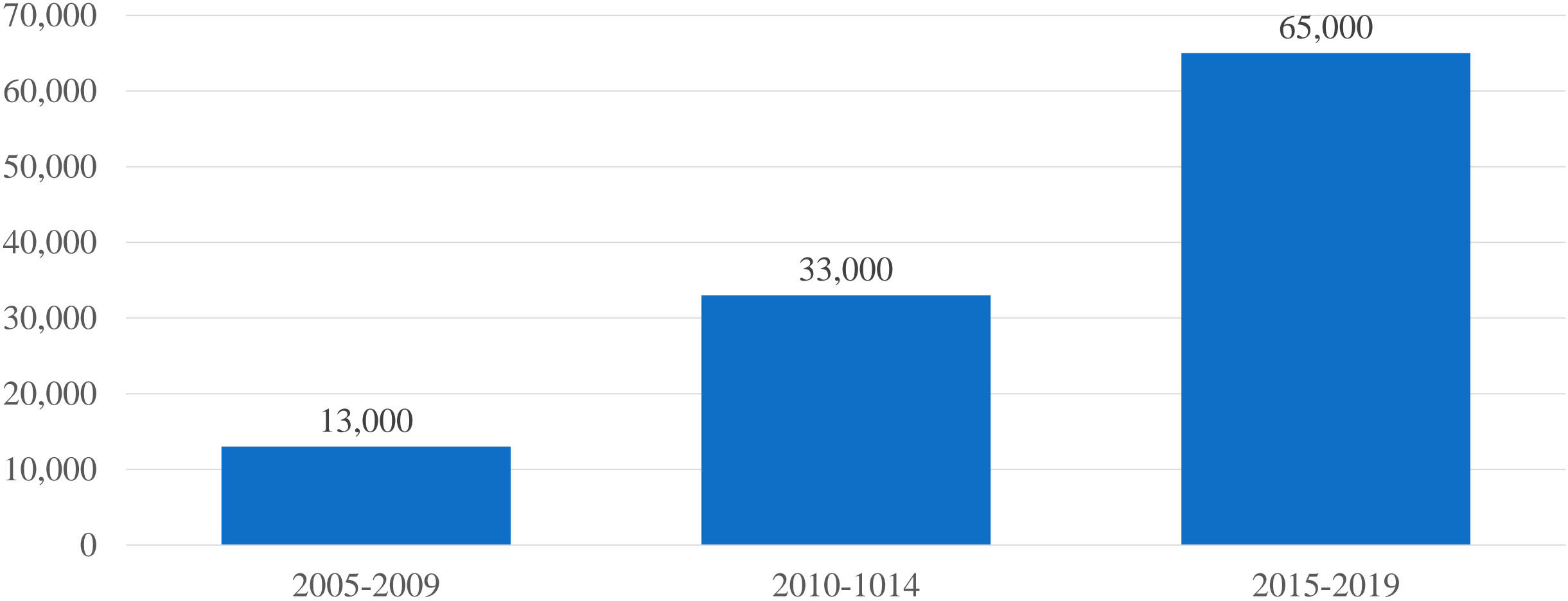
Water Sources	Volumes (2019)
<b>Conventional Water Resources</b>	
Groundwater (Nonrenewable)	2,060
Groundwater (Renewable)	2,300
Surface Water	100
<b>Non- Conventional Water Resources</b>	
Desalinated Water	2,200
Treated Wastewater	2,044
<b>Total Water Resources</b>	<b>8,704</b>



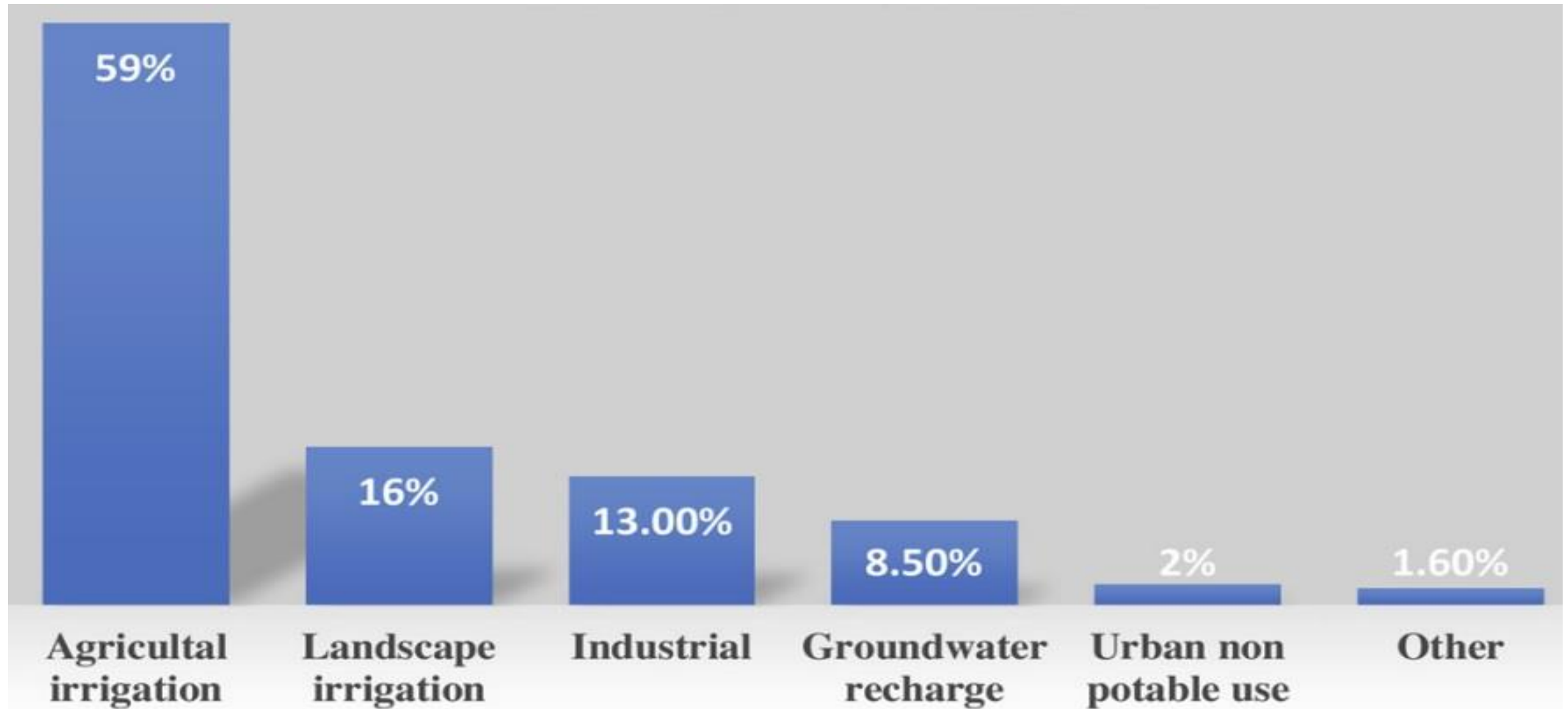
# Daily per Capita Average Water Consumption in the Domestic Sector (l/capita/day).



# Financial Requirements of the Water Sector (Million US\$).

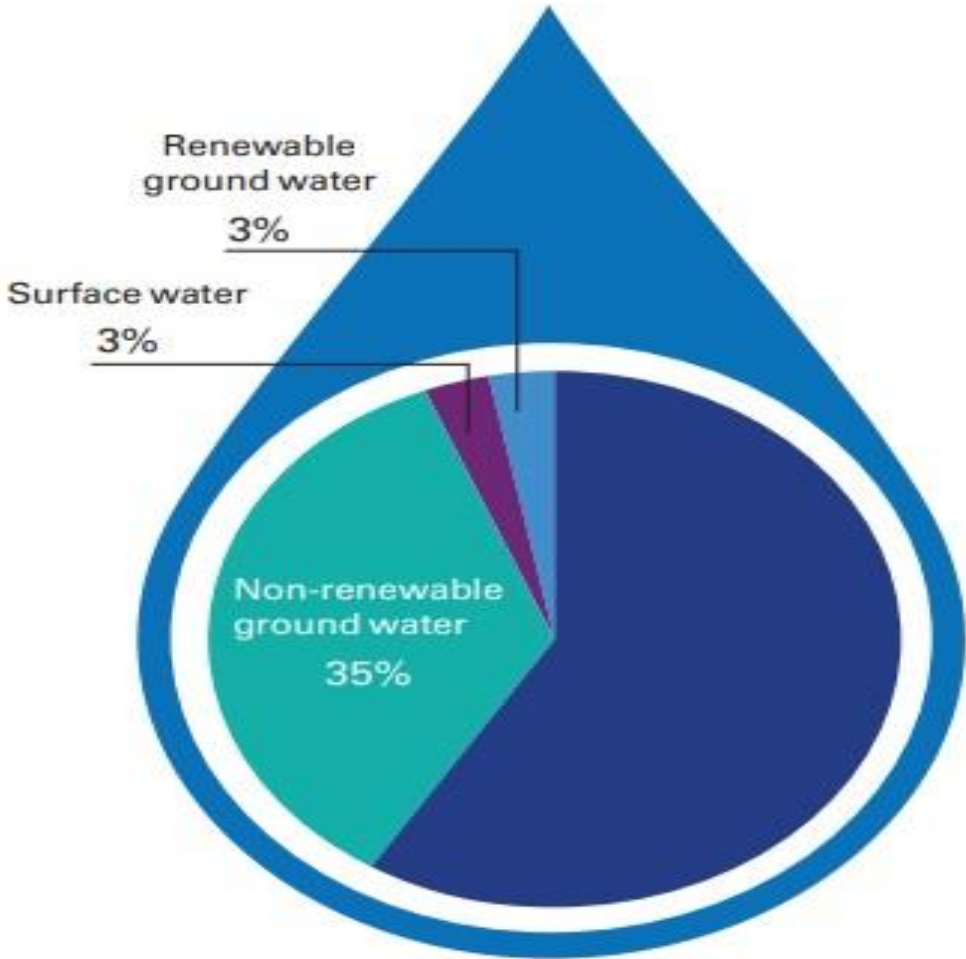


# Wastewater reuse in Saudi Arabia for 2018

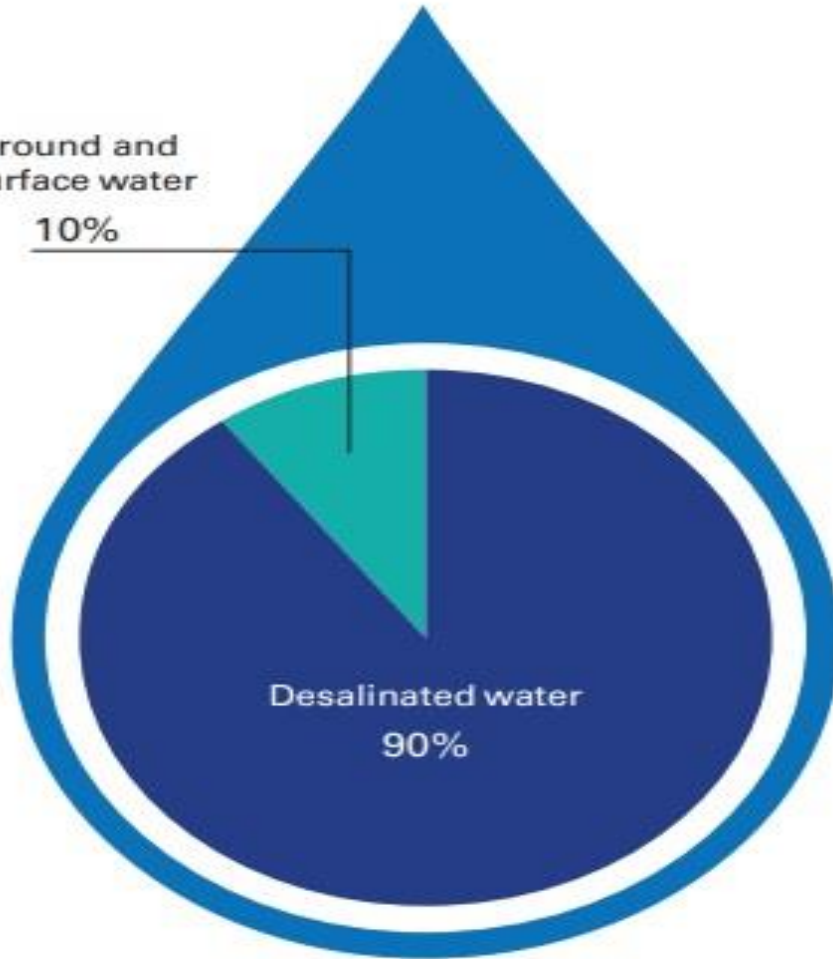




# Targeted change in water supply mix in KSA by 2030

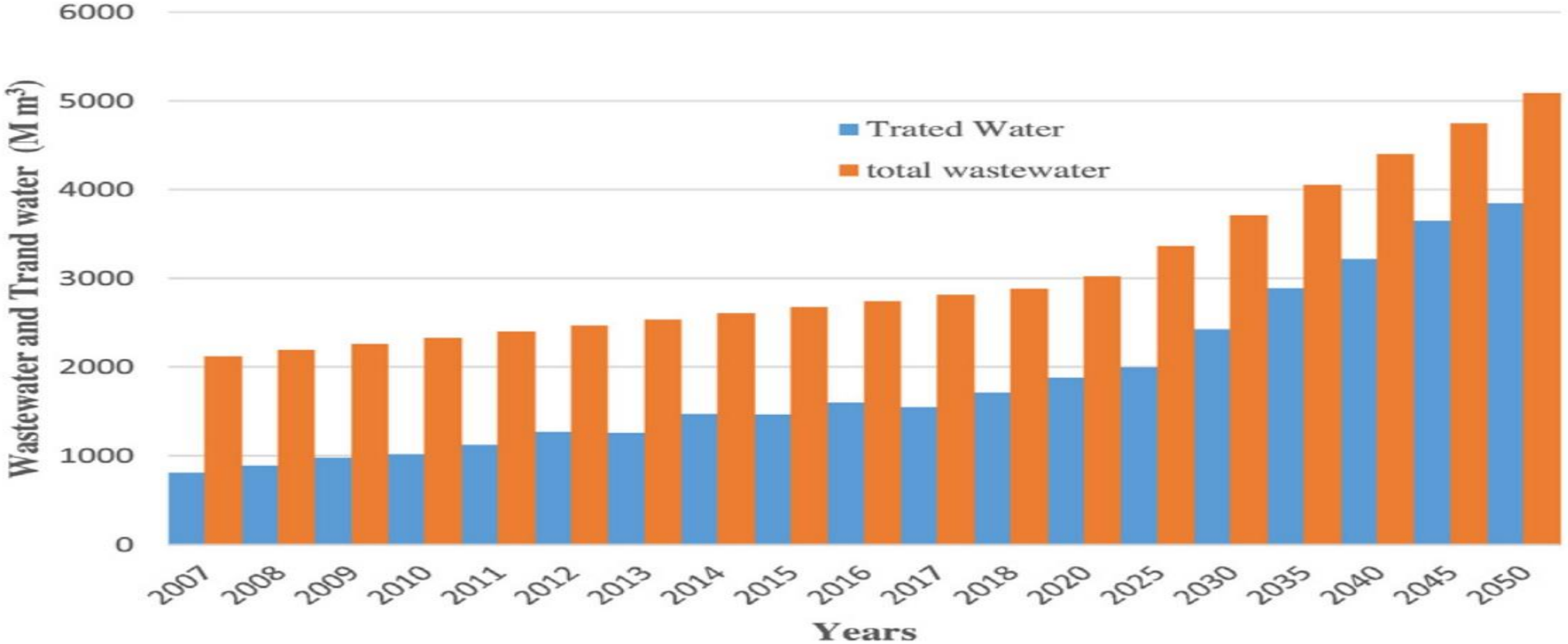


2018 urban water supply mix



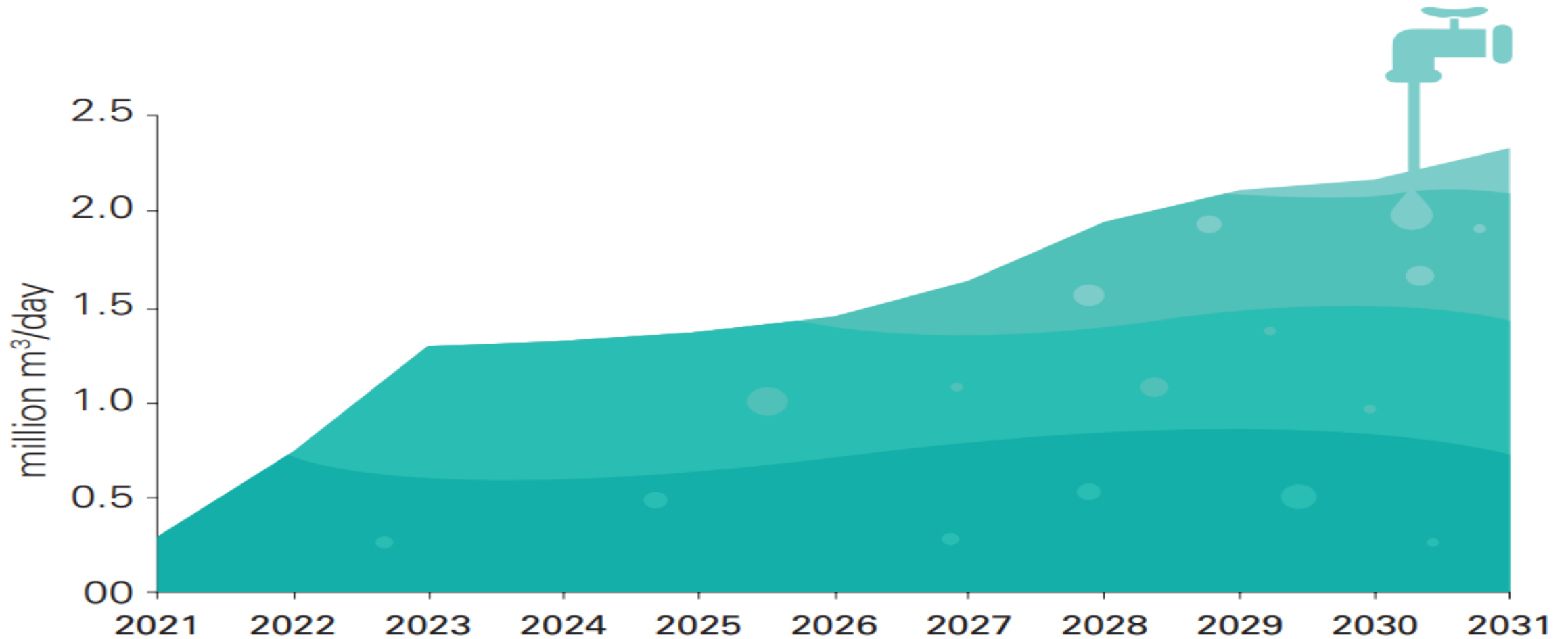
MEWA directive for 2030

# Changes in the wastewater effluent and treated water to 2050



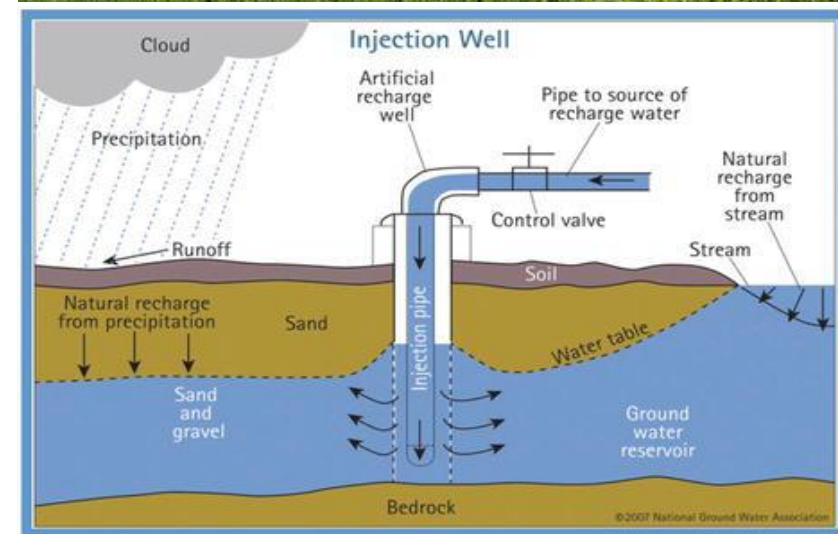


# Cumulative sewage treatment capacity planned to reach commercial operational date between 2021 and 2030



# Wastewater Reuse Options

- Irrigation
- Aquifer Recharge
- Environmental and Recreational Uses
- Industrial
- District Cooling



# Challenges Facing Wastewater Reuse

- Economics of Wastewater Treatment and Reuse
- Engagement of Private Sector
- Social Acceptance
- Environmental Impacts
- Technical Challenges for Wastewater Reuse
- Legal and Institutional Challenges



Under normal conditions, the following factors should be considered during the selection of any irrigation method:

- Water supply conditions
- Climate Conditions
- Soil Characteristics
- Cost of Irrigation Method
- Type of Crops
- System operation and management

Other factors that should be carefully considered for the irrigation with treated wastewater (in addition to normal conditions factors)

- Wastewater Quality
- Health Risk (Farm Workers)
- Protection of Soil and Groundwater
- Salinity and Toxicity Hazards
- O&M cost
- Water application

