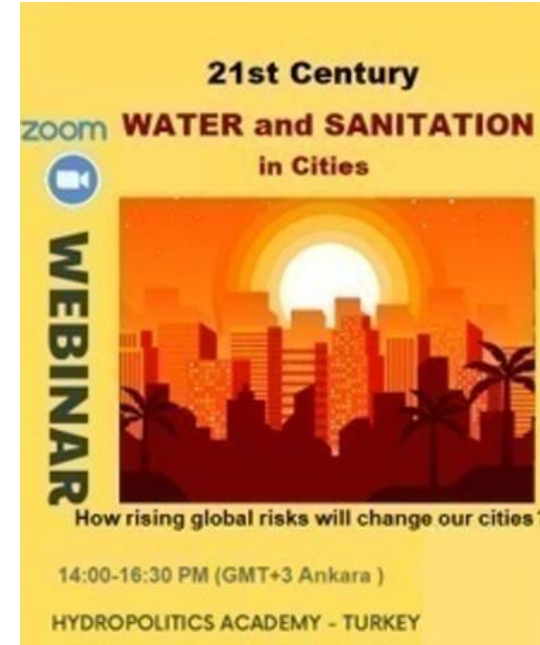


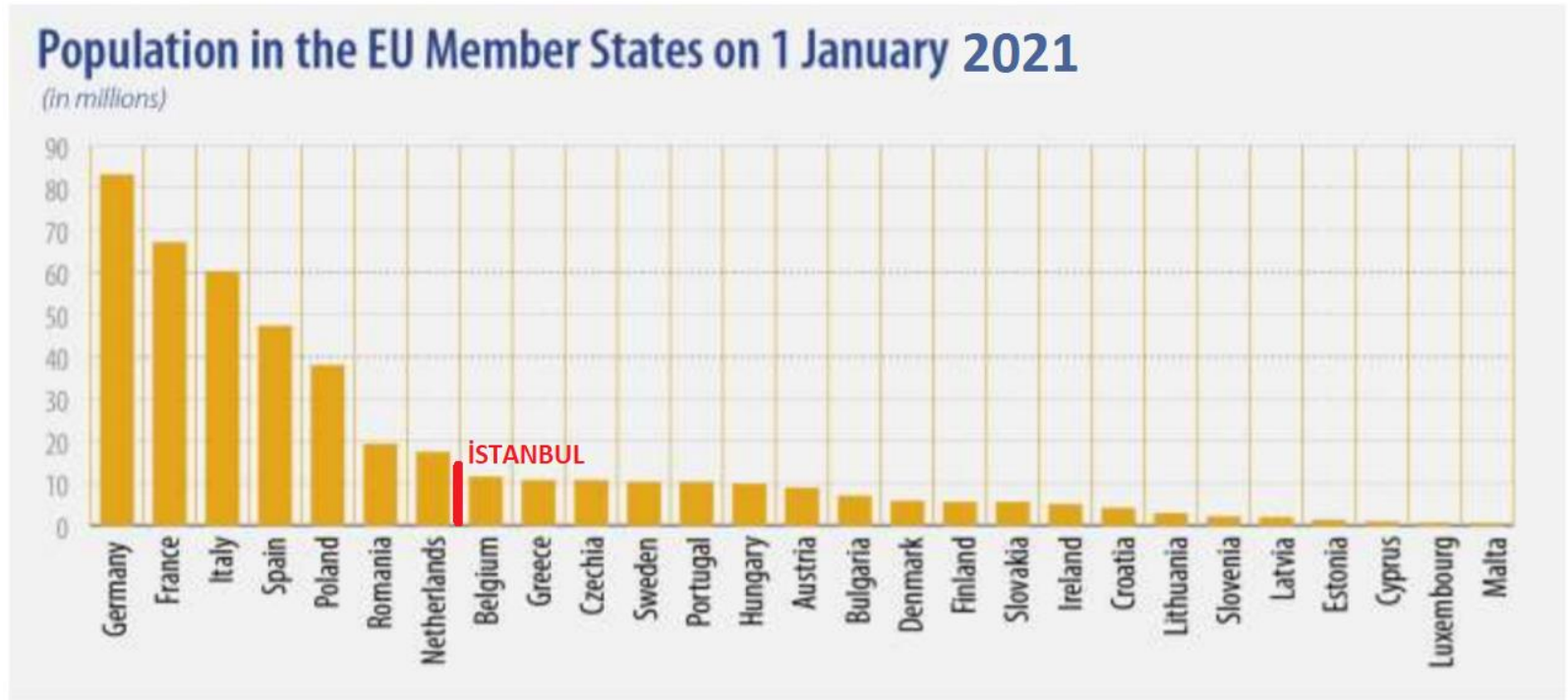


# Emerging threats, Water and Sanitation Management in Istanbul

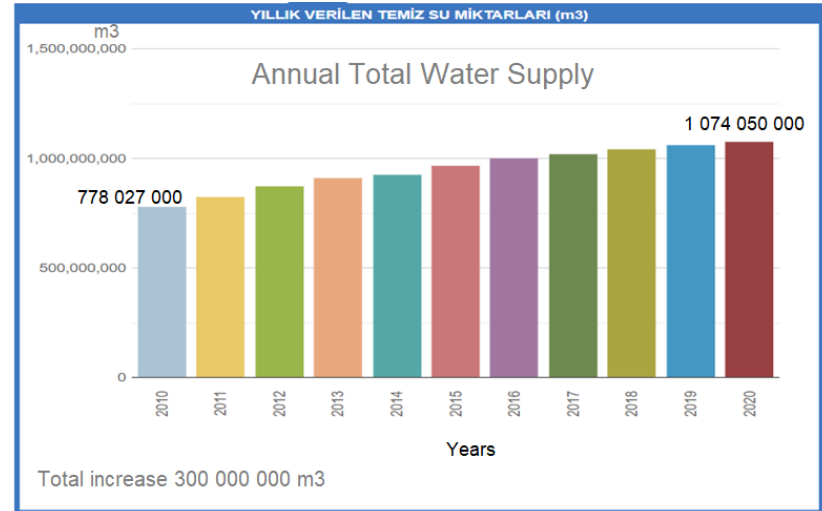
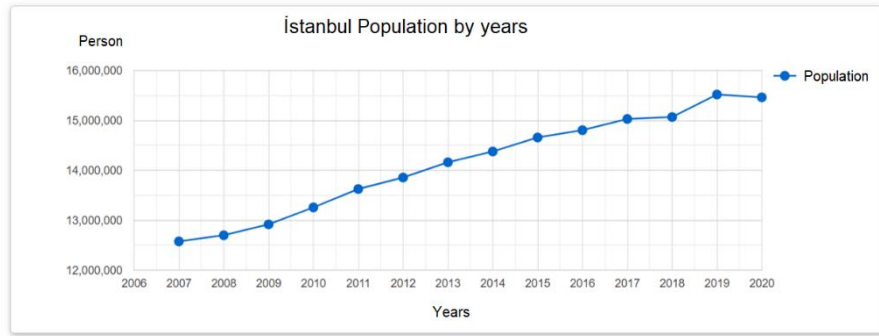
Dursun Yıldız C.E. Expert on Hydropolitics



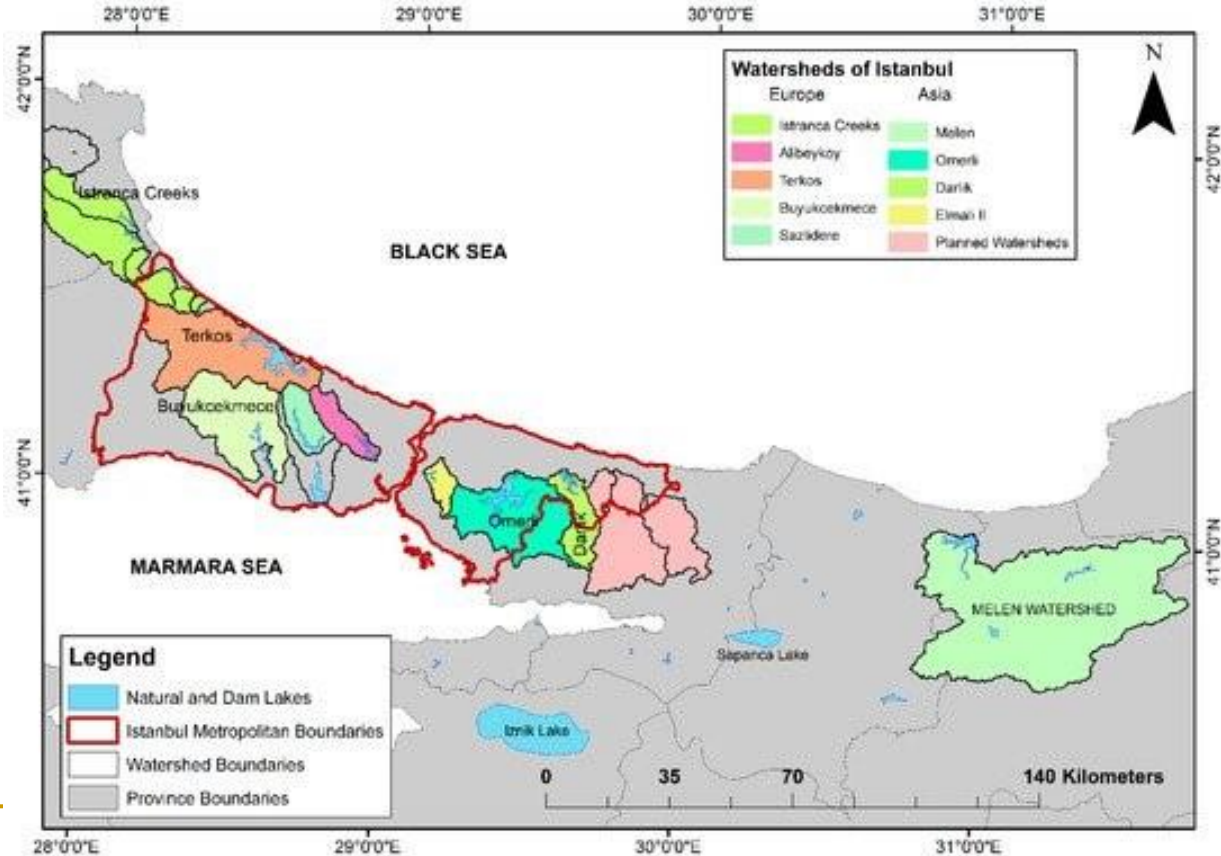
Istanbul population is higher than 20 EU countries

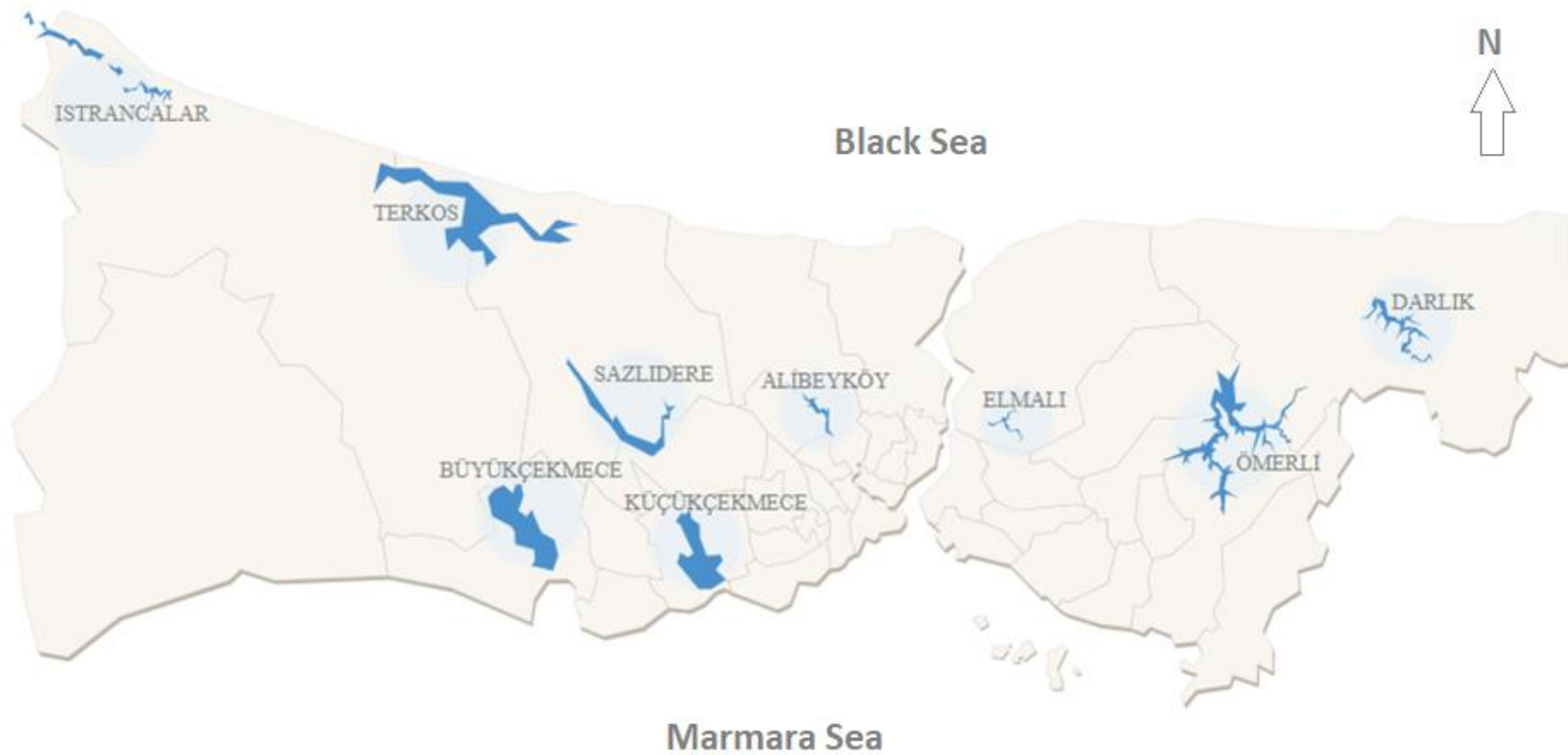


# Istanbul water and sanitation needs



# Watersheds of Istanbul





# Water and Sanitation Services in İstanbul by İSKİ

- 98 % of water resources in İstanbul are surface water resources
  - 60% of water resources are on the Asian side , while 40% of the water is on the European side
  - 115 pump station
  - 13 Potable water treatment plants
  - 114 water storage tanks
  - 18 000 km long potable water network pipes
  - 67 wastewater treatment plants
  - Wastewater network of 14,990 km in length
  - Network lost range %23 (unaccountable water )
- 
- ENERGY INTENSE WATER SUPPLY
  - DEPENDS ON INTER-BASIN WATER TRANSFER

Statistics on İstanbul

Population Served :	15 million 519 thousand
Total Area of Service :	5 thousand 461 km <sup>2</sup>
Number of Subscribers :	6 million 638 thousand 791
Length of Water Network :	19 thousand 577 km
Length of Transmission Lines :	2 thousand 847 km
Yield of Water Resources :	1 billion 653 million m <sup>3</sup> /year
Average daily water supply :	3 million m <sup>3</sup> /day
Number of Potable Water Treatment Plants :	21
Capacity of Potable Water Treatment Plants :	4 million 352 thousand 220 m <sup>3</sup> /day
Number of Water Storage Tanks :	152
Volume of Water Storage Tanks :	1 million 567 thousand 080 m <sup>3</sup>
Total length of sewers :	16 thousand 515 km
Length of Collector Lines :	1197 km
Length of Tunnels :	201 km
Number of Wastewater Treatment Plants :	88
Capacity of Wastewater Treatment Plants :	5 million 811 thousand 990 m <sup>3</sup> /day



İstanbul	West	%	East	%
Population	9 959 793	64,5	5 502 659	35,5
Used Water Poten.		40		60
Daily Water Use	2 000 000 m3	66	1 000 000 m3	33
Additional water pot.	150 mm3/year		400 mm3/year	



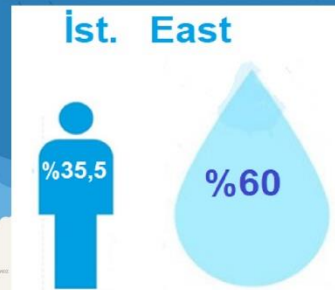
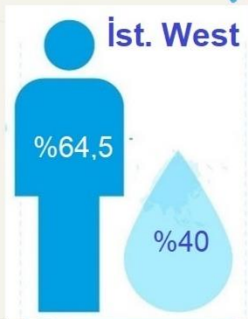
KIRKLARELİ

TEKİRDAĞ

# Daily water use 2 000 000 m<sup>3</sup>



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# Daily water use 1 000 000 m<sup>3</sup>

ARITMA TESİSLERİ

- Drinking water
- treatment plants

KOCAELİ





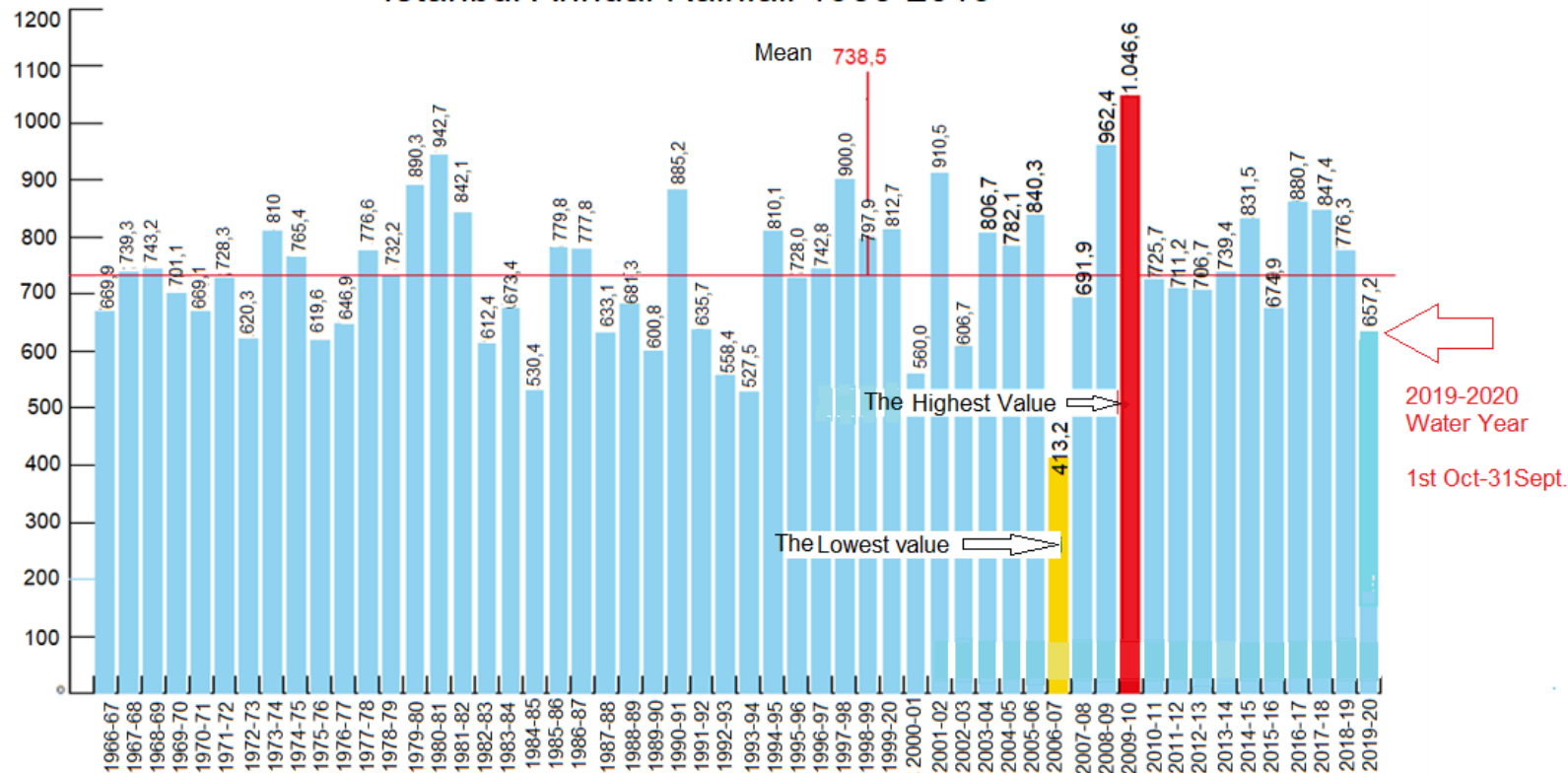
# Solution until 2040

Greater Istanbul Water Supply Project, Melen System



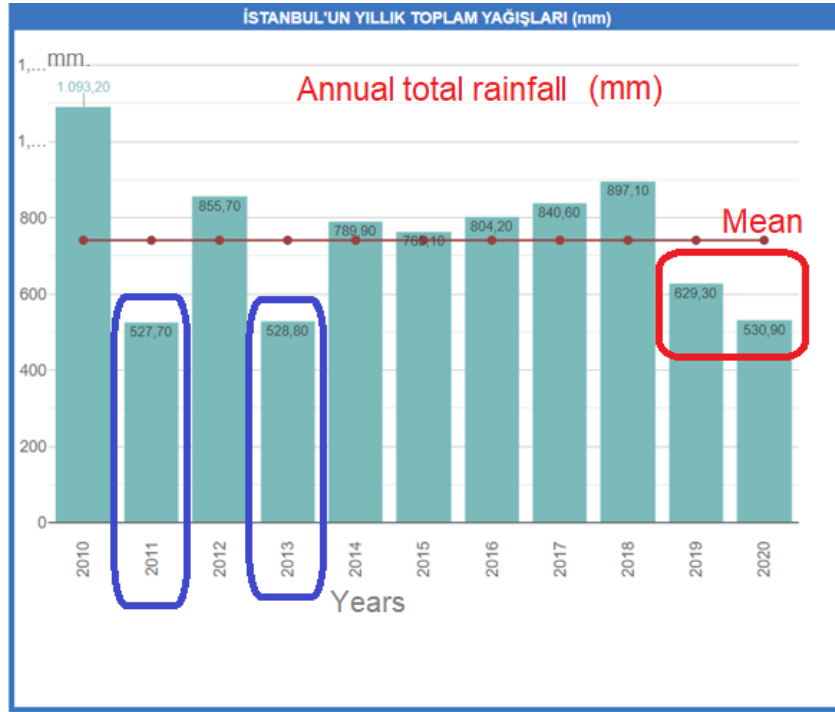
Rainfall (mm)

## Istanbul Annual Rainfall 1966-2019

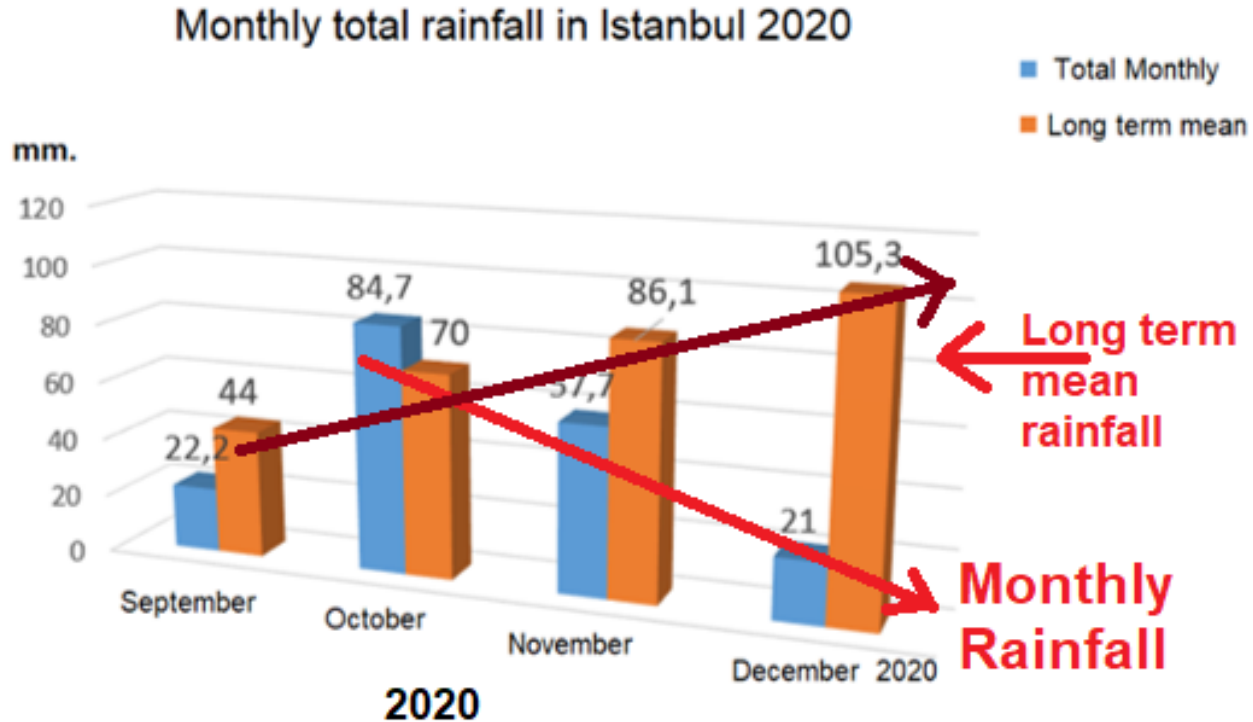


Source: Annual Activity Report 2019 .İSKI

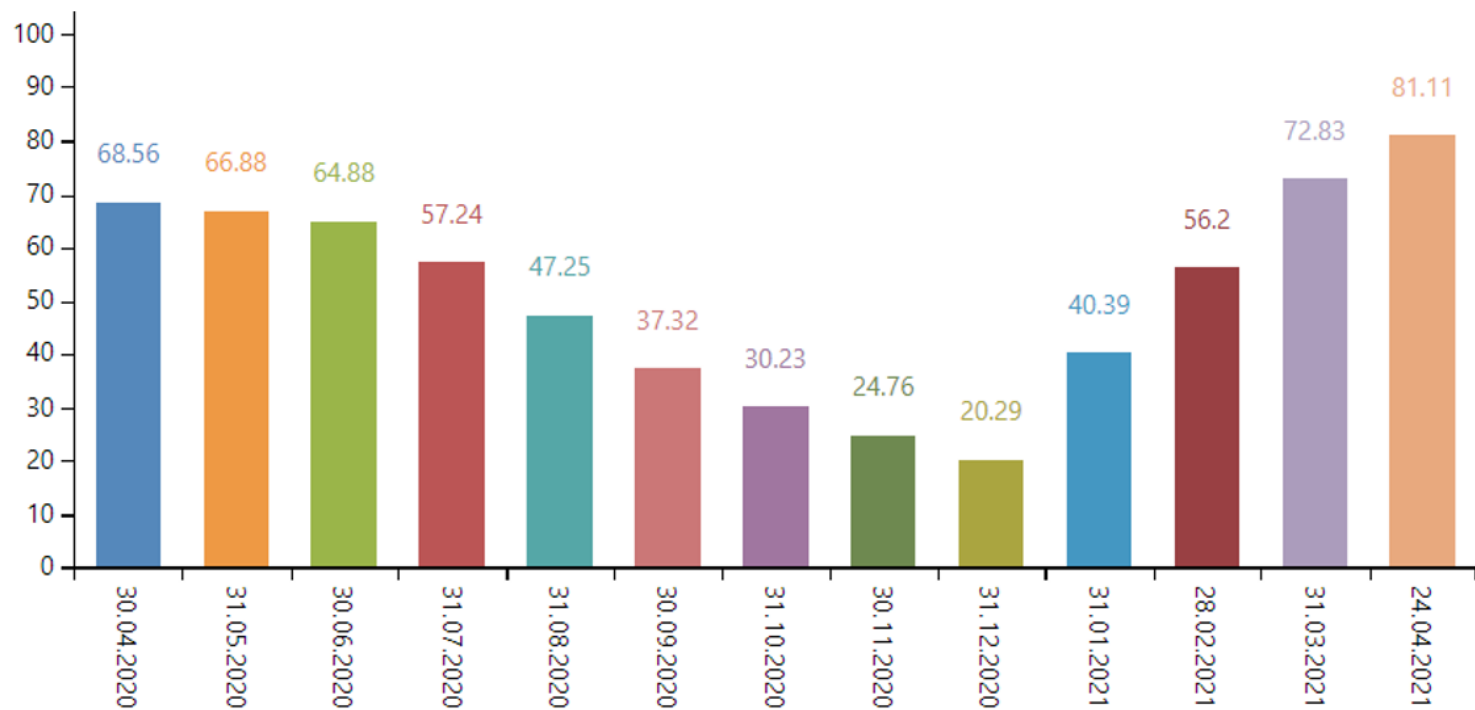
# Annual total rainfall in İstanbul



# 2020 Hydrological Drought



## % Total water volume rate in İstanbul's water supply dams reservoirs (2020-21)

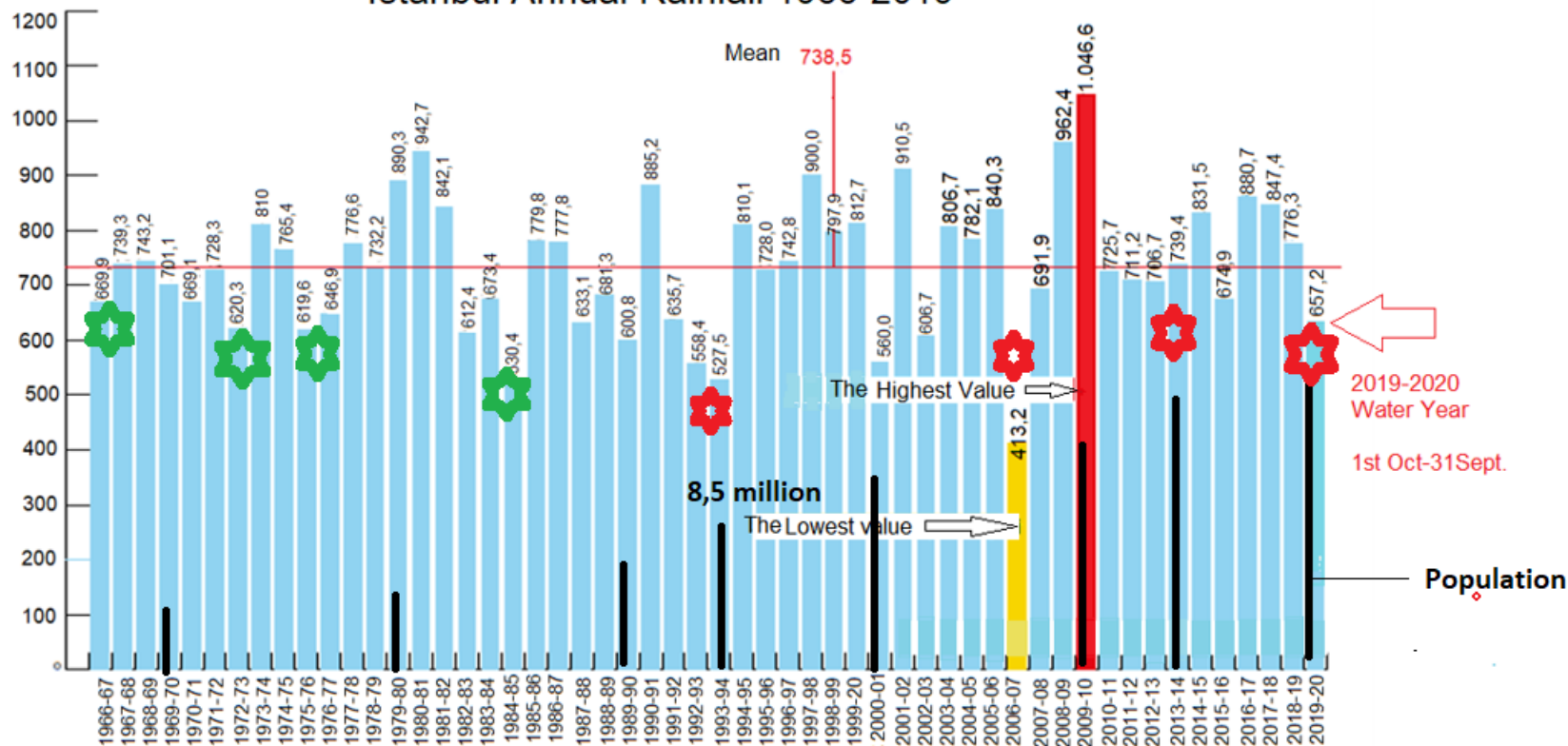




# In conclusion

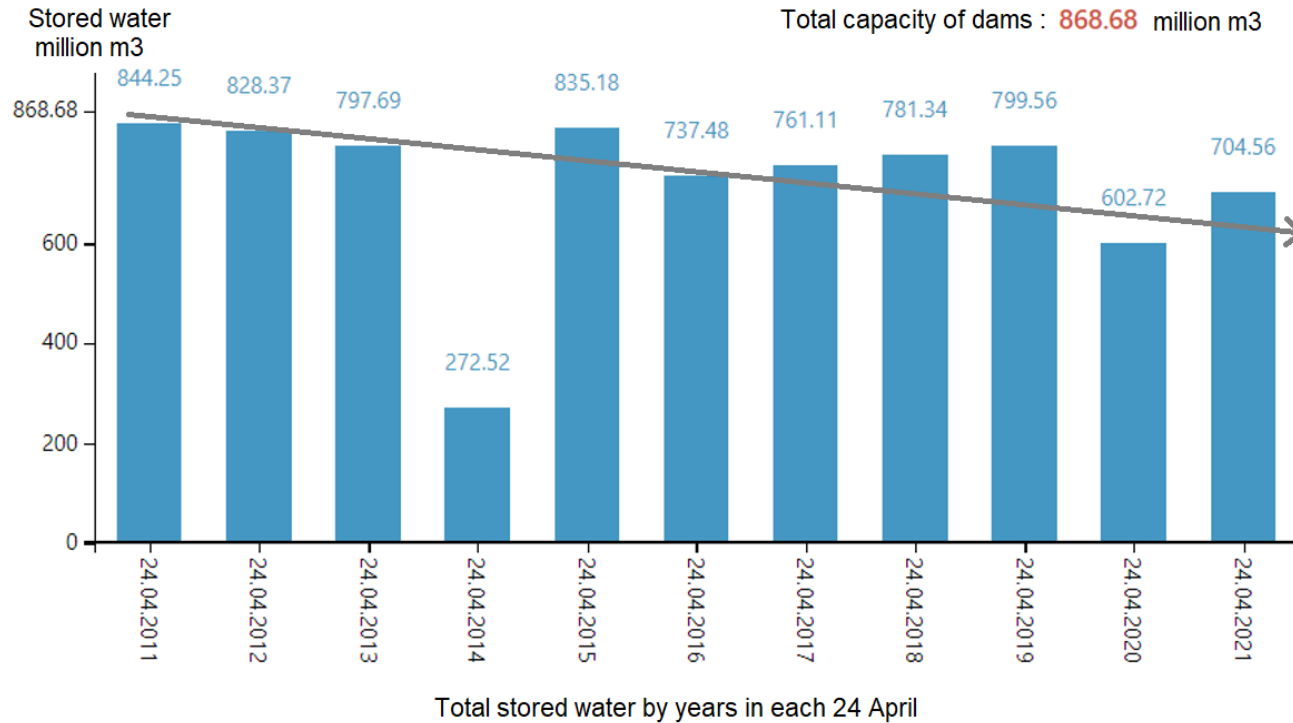
Rainfall (mm)

Istanbul Annual Rainfall 1966-2019





# Stored water volume in April (10 years)



DSİ XIV. BÖLGE MÜDÜRLÜĞÜ  
BÜYÜK İSTANBUL İÇME VE KULLANMA  
SUYU PROJESİ

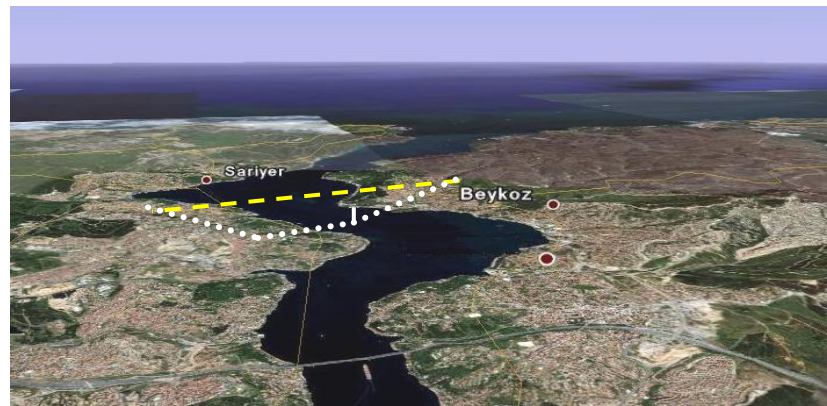
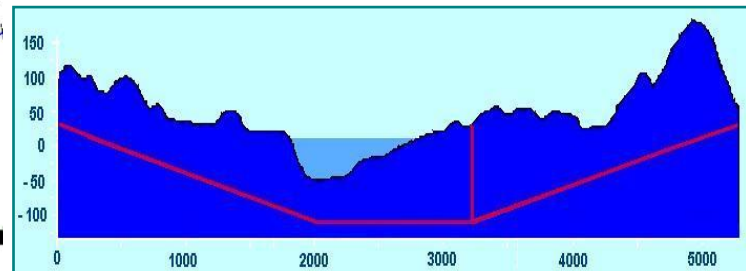
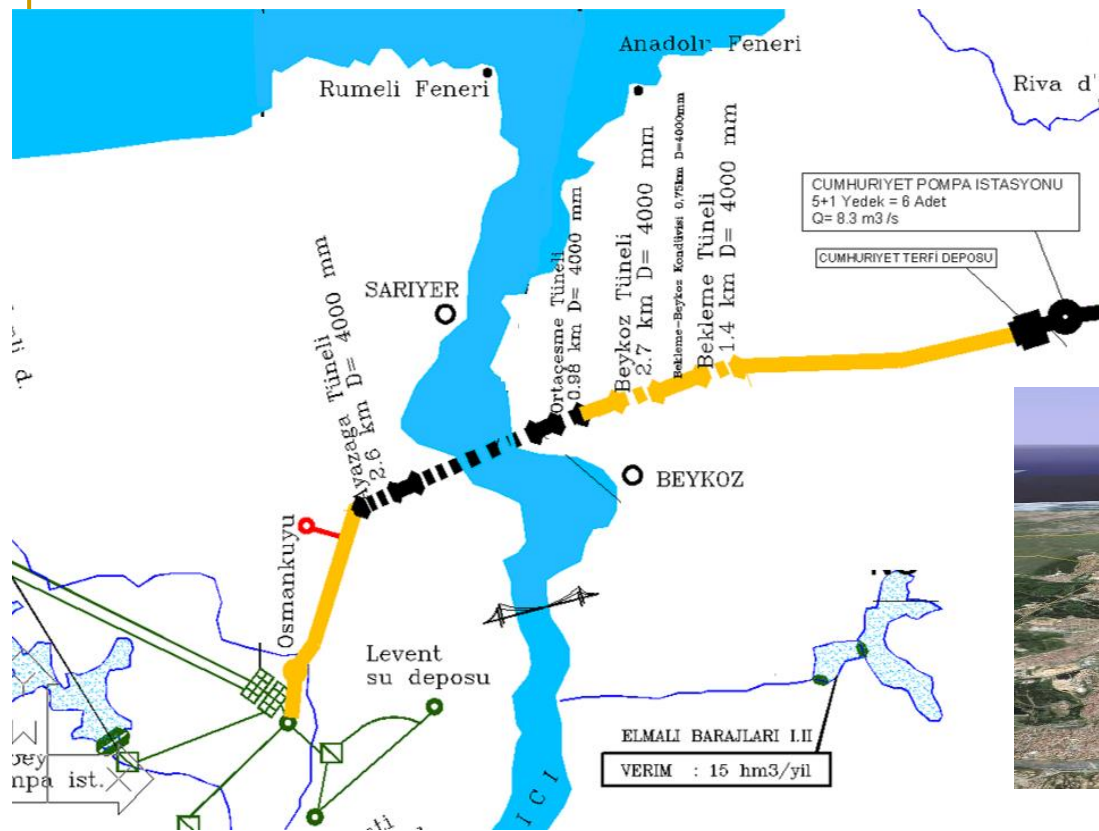
MELEN PROJESİ



0 5 10 20 30 40  
km

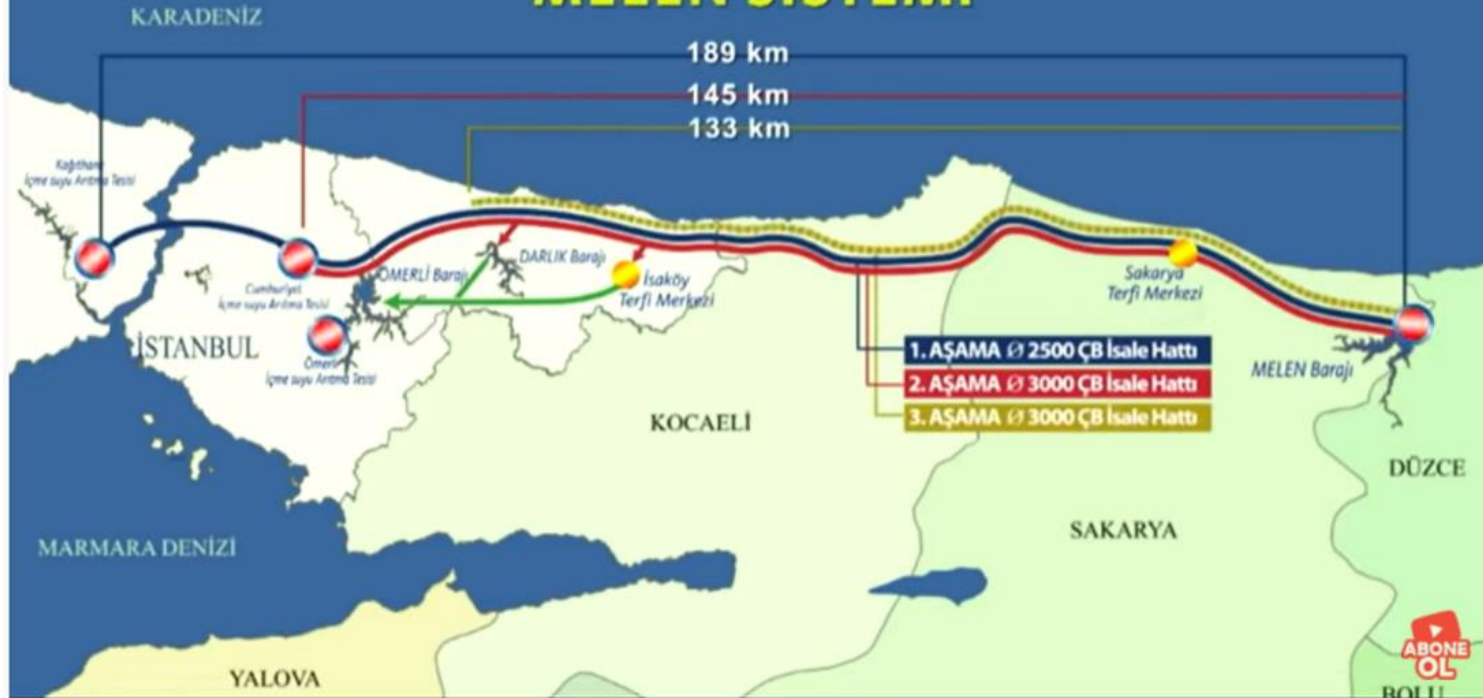
- Master Planlama
- Planlama
- İnşaa Halinde
- İşletmede





## İSTANBUL İÇİN BÜYÜK İÇME SUYU PROJESİ

# MELEN SİSTEMİ



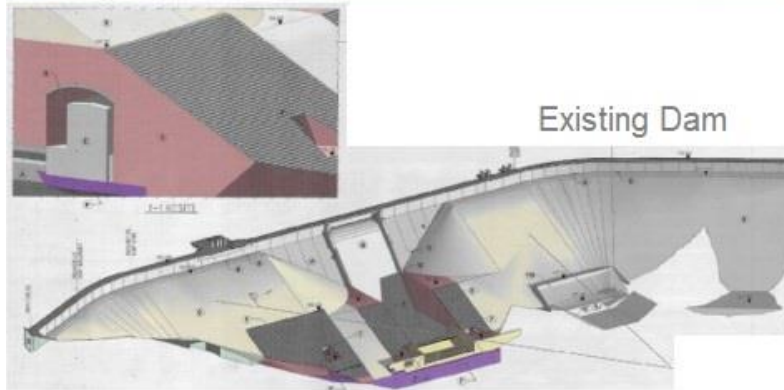
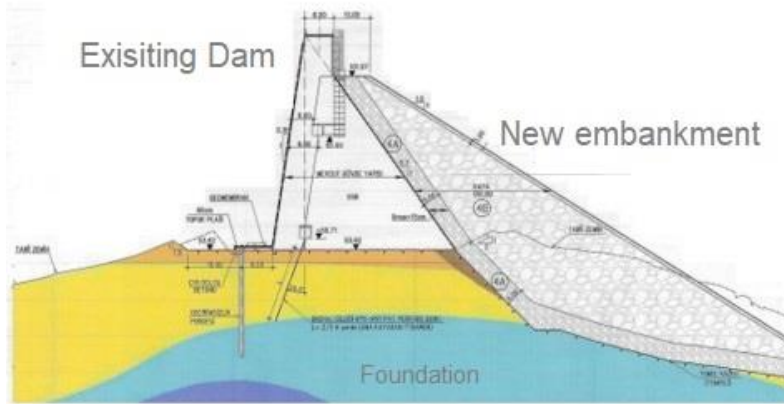
Melen Suyu Boru Hatları | Melen Projesi





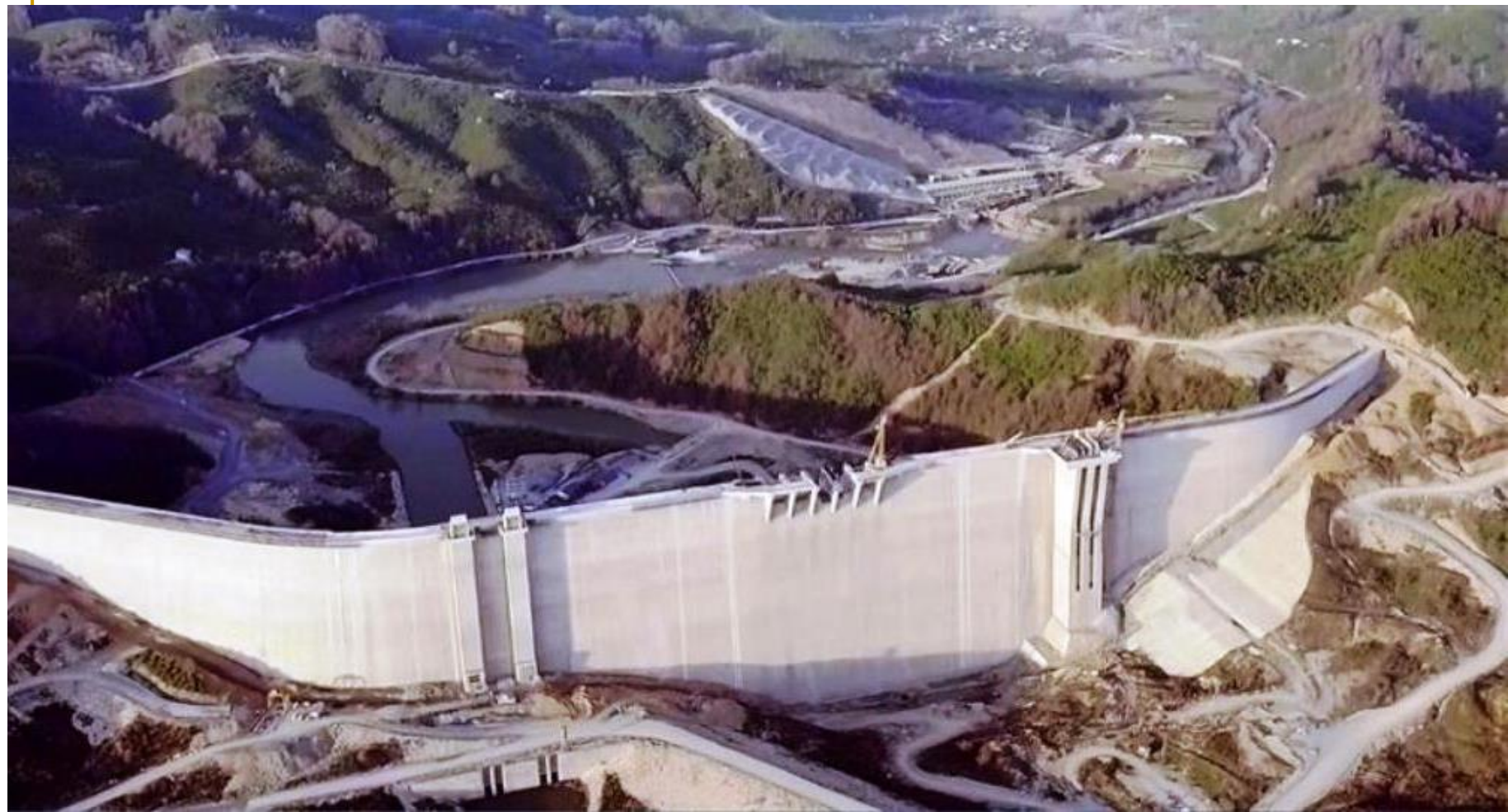


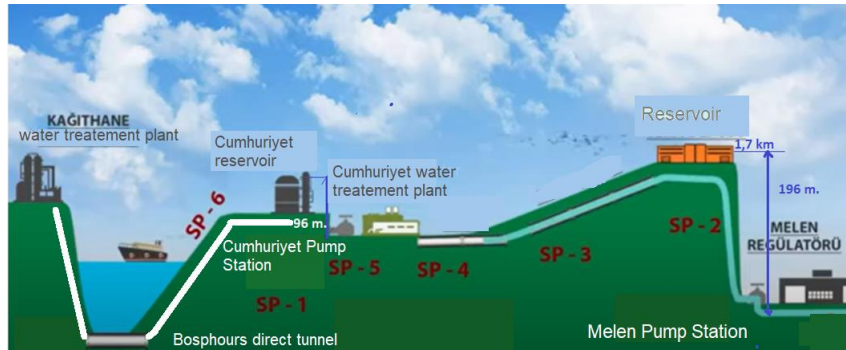
# Melen Dam will be strenghteen till 2023



Additional embankments on  
downstream face of dam body

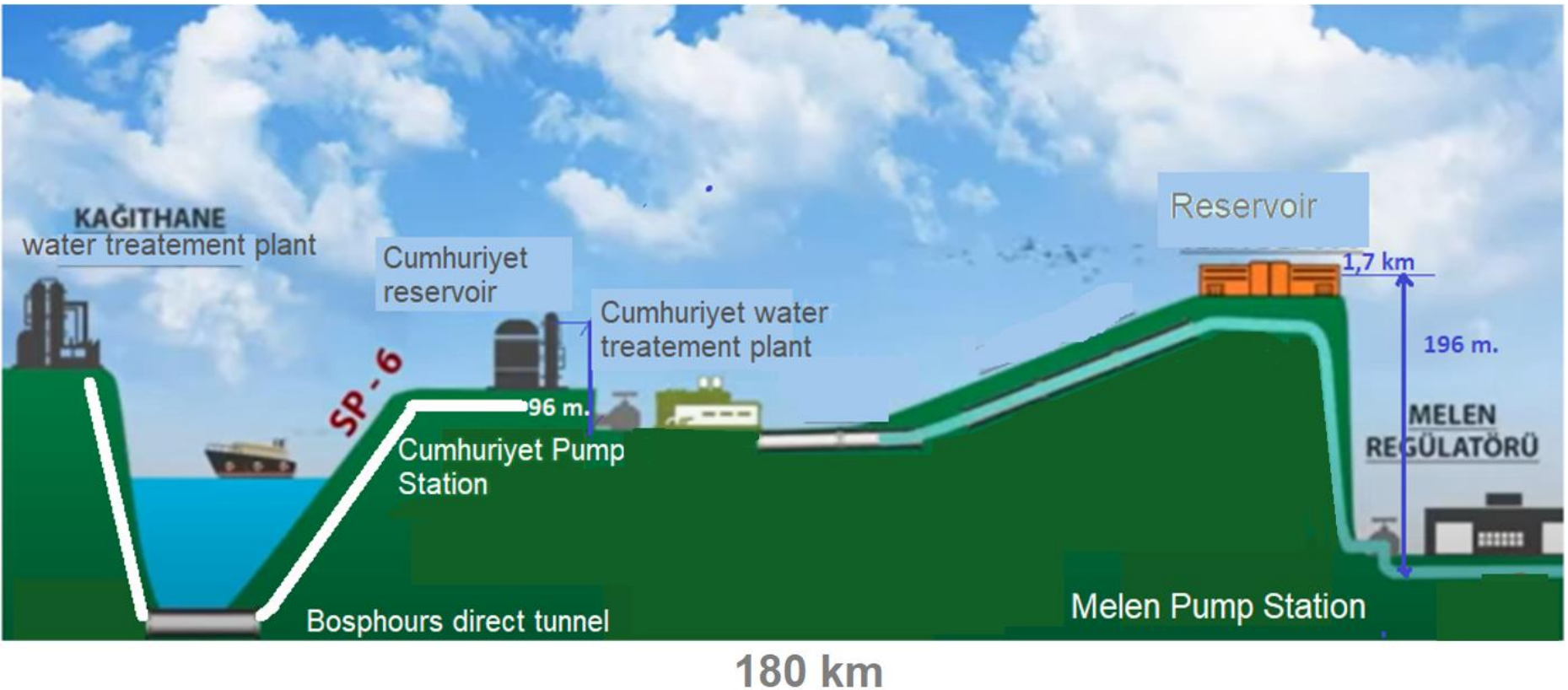








# Melen System supply from Regulator

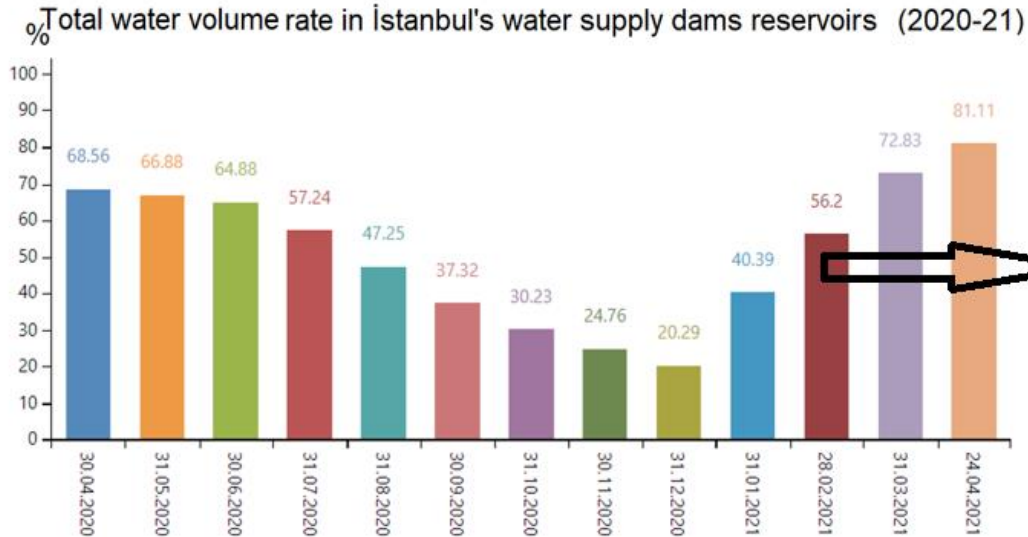


# New plan for İstanbul water supply

- Water demand management
- Reduction of leakage
- Treated wastewater use
- Public awareness campaign to encourage more efficient use of water for daily needs
- New concepts for water management (HPA Recommendation)



# Water Demand Management Feb.2021



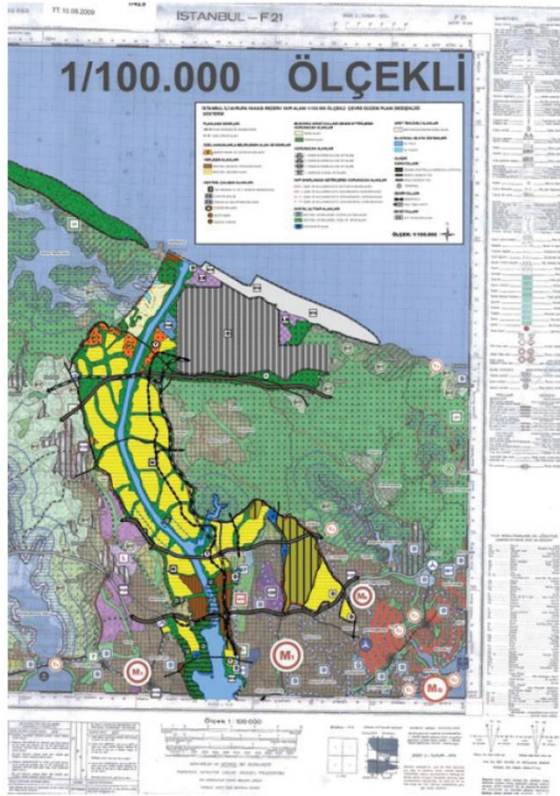
İmamoğlu, Mayor of İstanbul stated that :  
-We must implement water demand management rules, it is just time to start

# New Challenge: Istanbul Canal



- 70 million m<sup>3</sup> /year water reservoir capacity will be lost
- Groundwater well digging is restricted by State Hydraulic Works in the Canal route area

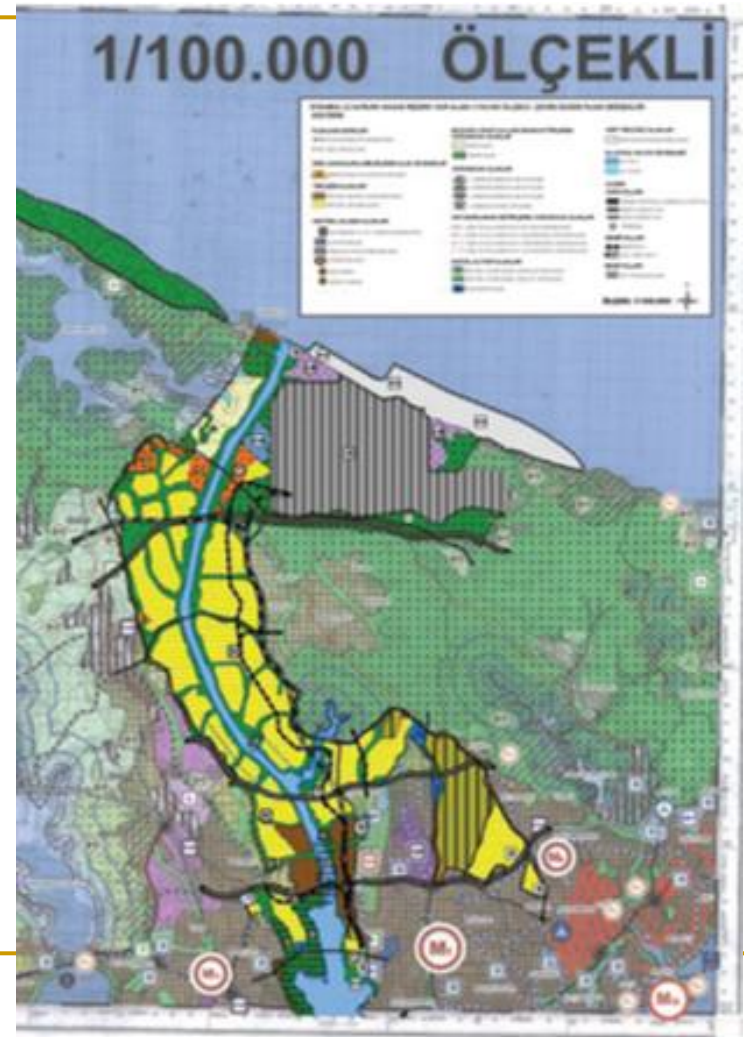






# New settlement plan

- Population growth (1,5 million)
- Increase in water demand and sanitation services
- New water and sanitation infrastructures



In order to supply additional water for increasing water demand





# Additional Dams planned in both side



# Additional water potential







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İDARESİ



İSTANBUL  
BÜYÜKŞEHİR  
BELEDİYESİ

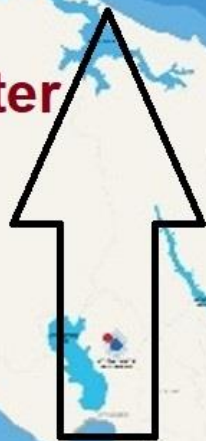
İSTANBUL SU VE KANALİZASYON İDARESİ

● Drinking water  
● treatment plants

OSMANGAZİ  
DAM

SUNGURLU DAM

**Increasing Water  
Demand**



İSKİ TİCARET  
● Drinking water  
● treatment plants



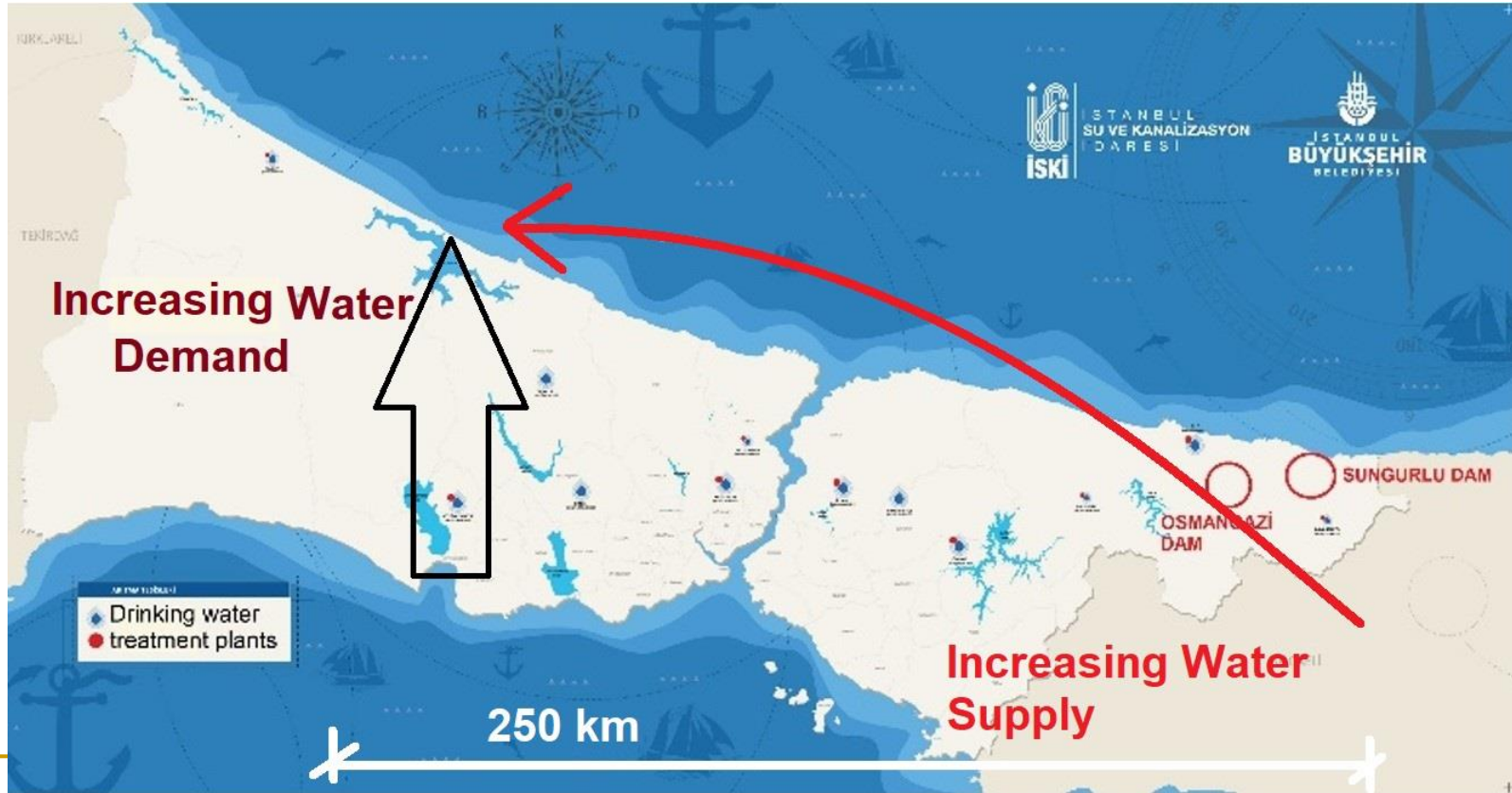
İSTANBUL  
SU VE KANALİZASYON  
DARESİ



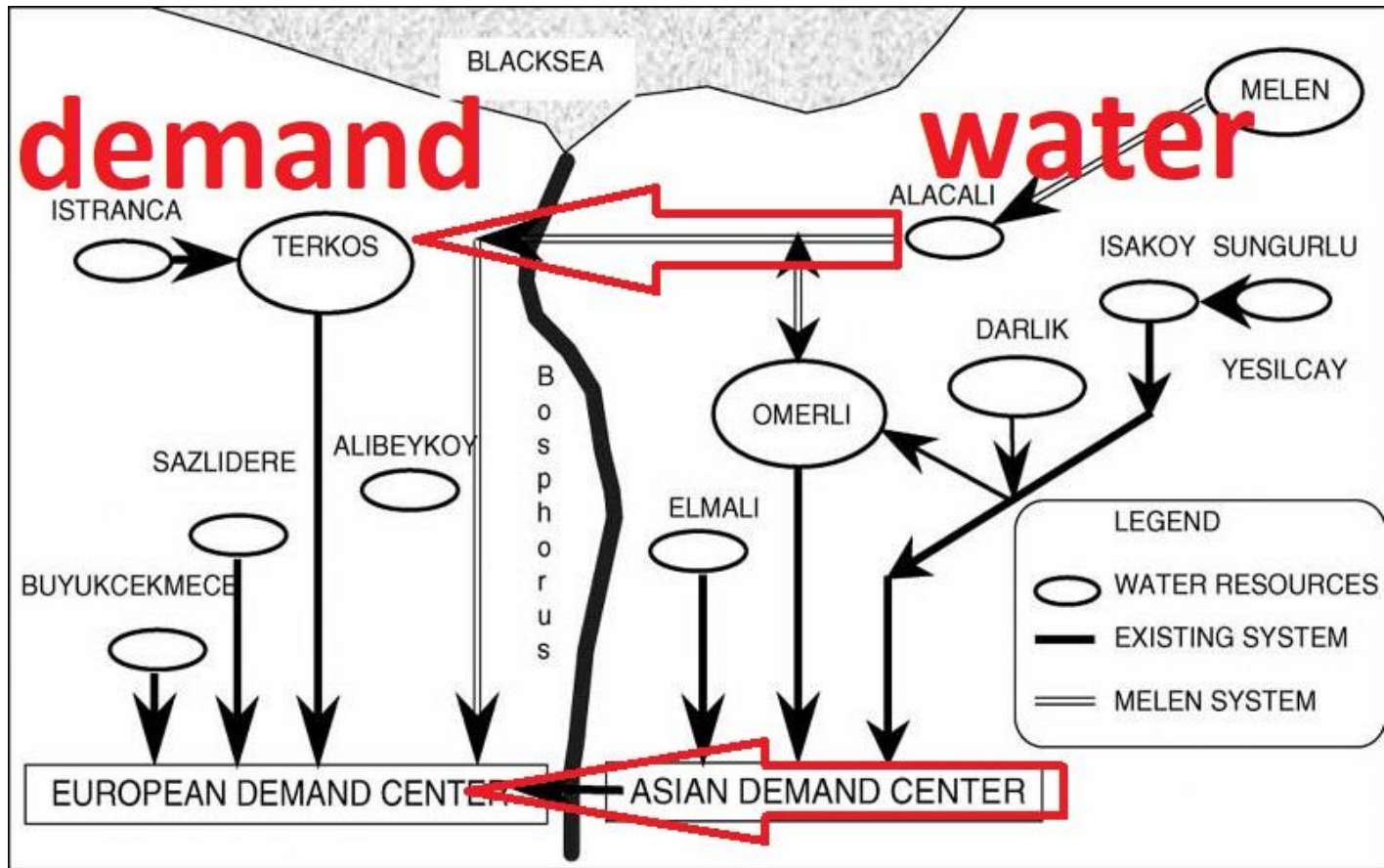
İSTANBUL  
BÜYÜKŞEHİR  
BELEDİYESİ

OSMANGAZİ  
DAM  
SUNGURLU DAM

# WATER SUPPLY MANAGEMENT



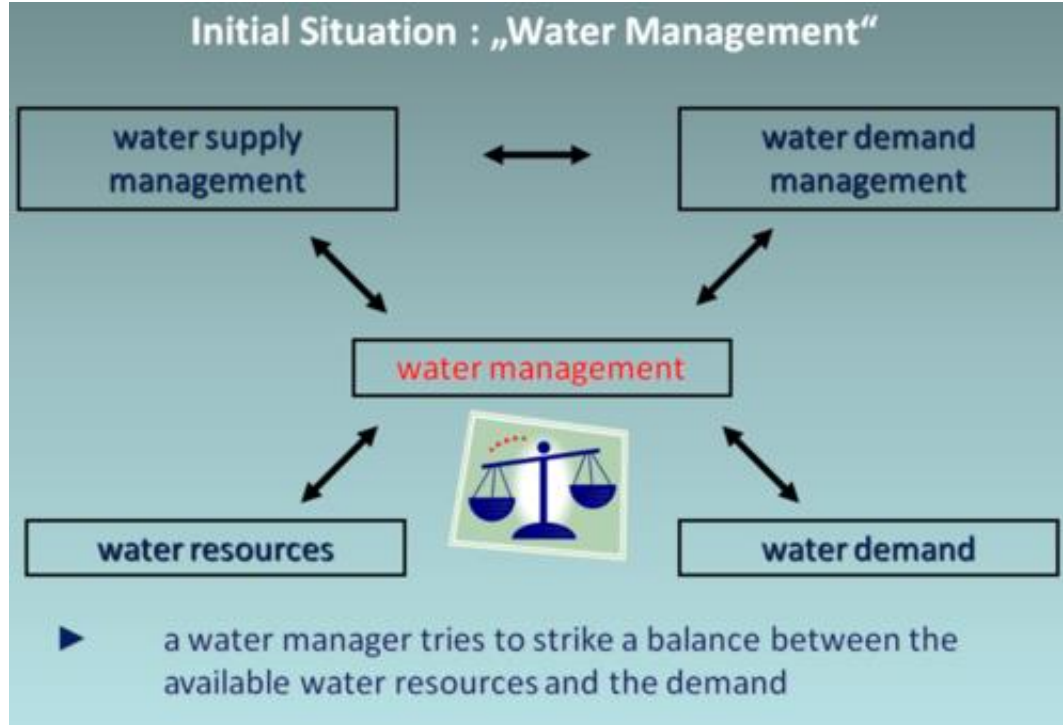




Istanbul west

Istanbul east

# Sustainable Water Management

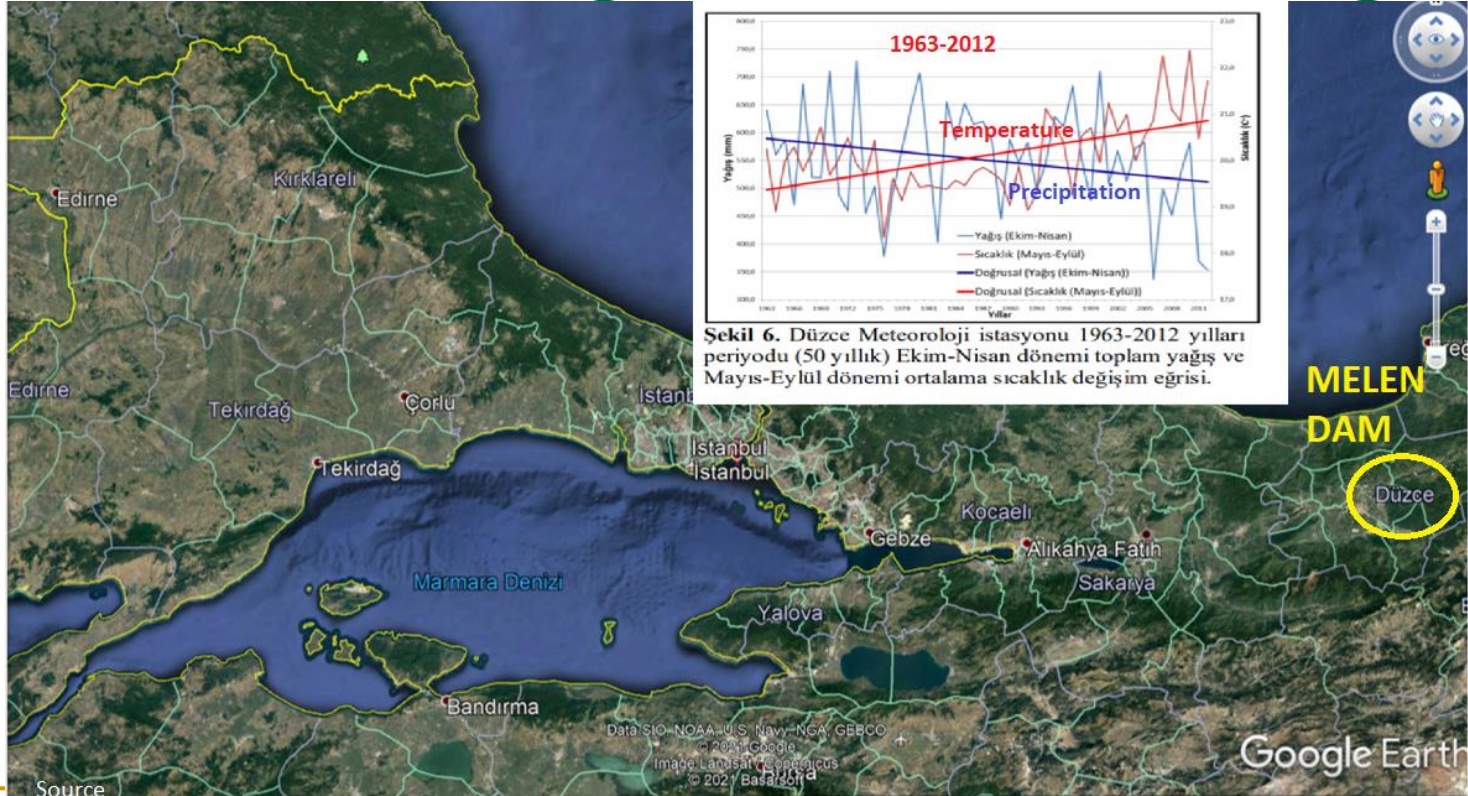


# Available water resources ?





# Another challenge is climate change

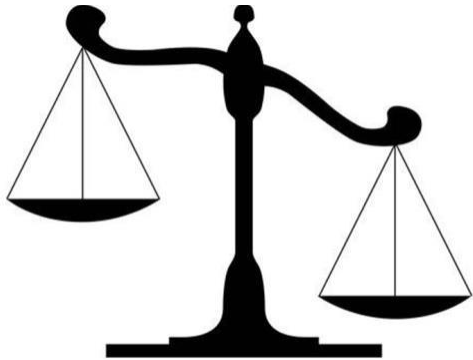


In the context of climate change, water management problems of İstanbul

Hüseyin Turoğlu\*

1 İstanbul Üniversitesi, Edebiyat Fakültesi, Coğrafya Bölümü, İstanbul

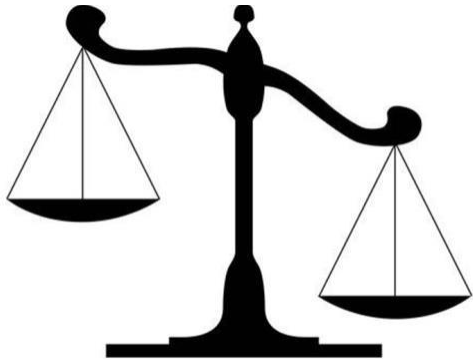
## Lessons learned



Istanbul sets a good example to the challenges faced in water supply in heavily populated cities,

Water supply management policy created a rapidly growing demand and a massive interbasin water transfer project (Melen Project) .

# Lessons Learned



Right in time measures in water management are vital to manage future risks

Problems caused by lack of implementation of water demand management could be compensated by some expensive engineering solutions

Water demand management need to be implemented when water is available

# Water supply management

Even though Istanbul has had water supply problems periodically, the sustainable water governance to Istanbul has not been the subject of scientific and innovative management concepts.

The most important reason for this has been the policy of providing water to the rapidly increasing population.

The Istanbul Metropolitan Municipality has tried to meet the water demand of the increasing population with only supply management concept

It resulted water transfer from other river basins with higher cost

In Istanbul rising water demand and supply management trends point towards unsustainable use of water

**This paradigm needs to be shifted**



# PARADIGM SHIFT



New project came into sight (İstanbul Canal)

Meteorological drought periods continue to effect seriously

Smart Technologies and New concepts have been developed (4R)

Water for liveability approach is needed

# What to do ?

- Considering innovative concepts
- Istanbul Water and Sanitation Governance can be replanned as East and West İstanbul water management



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Thank you



*Think Forward . Lead Forward*

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