



**IWA "CITIES OF THE FUTURE"  
PROGRAM  
NATIONAL PARTNERSHIP,  
TURKEY**



**RÜYA TAŞLI TORAMAN  
IWA Turkish National Committee on  
Water Pollution Research and Control**

# PROGRAM INITIATION

- The protocol has been signed on June 14th, 2010 between



International Water Association



Turkish National Committee on Water Pollution  
Research and Control



T.R. Ministry of Environment and Forestry



Istanbul Metropolitan Municipality



Kayseri Metropolitan Municipality



Trabzon Municipality

# INTRODUCTION

- The parties have agreed to collaborate over a three year period to implement IWA's Cities of the Future program with three partner cities: Istanbul, Kayseri, and Trabzon.
- This collaboration will link Turkish university expertise with IWA experts from around the world who will volunteer their expertise as part of the program. The collaboration between international, Turkish, local and ministerial experts will create a model of an integrated approach to infrastructure investments consistent with the Cities of the Future paradigm.



# INTRODUCTION

- Cities of the Future represents an acknowledgement by leaders in the water community that the current techniques used most predominately for **water supply**, **wastewater treatment**, and **storm water management** do not reflect the growing realities of a changing global context.
- Human **population growth**, **rising incomes**, and **increased urbanization** are colliding with **resource limits** and **global warming** to create an imperative for change in both the developing and developed regions.
- Cities of the Future takes *an integrated approach that recognizes that water is at the center of life.*



# INTRODUCTION

- most major impacts that humans will directly experience from climate change are water-based: increased flooding, increased drought, and increased sea levels.
- In a City of the Future context, land planners and land development entities will make informed choices that use and reuse water most efficiently while protecting source and receiving waters.
- In some cases institutions may need to adapt their regulations, policies, and standards to facilitate a range of new techniques. Whether public or private, investors in new infrastructure will fund efficient solutions that do the best job of minimizing energy, water, and resource use.
- Istanbul, Kayseri, and Trabzon each have unique opportunities and needs that align with the Cities of the Future approach.



# OBJECTIVE

- To Develop the Cities of the Futures Program in Turkey and Position Turkey for Increased Regional Leadership on Water Issues
  - Cities of the Future is about “learning by doing.”
  - Concepts and technologies about integration and vision must be implemented to gain broader acceptance and relevance.
  - an opportunity to add rigor to solution sets that combine the facts on the ground with emerging global best practice gleaned from leading edge projects from around the world.
  - “Cities of the Future” aims to inform, inspire, and broaden alternatives for the three partner cities with major infrastructure investments ahead of them.
  - A methodology is to be developed to serve as a guide for all Turkish cities with similar issues and opportunities.



# OUTCOMES

- Strategic Water Management Plans for Three Cities in Turkey
- Capacity Building
- Refinement of the Cities of the Future Methodology
- Enhancing Turkey's Competitive Position as a Provider of Water Services



# OUTCOMES

- Strategic Water Management Plans for Three Cities in Turkey
  - Istanbul, Kayseri, and Trabzon will each develop strategic plans for water management alternatives.
  - These Strategic Water Management Plans will include a portfolio of approaches to be included by each of the cities as they make their infrastructure and land use decisions.





# OUTCOMES

- Capacity Building
  - empowering local officials and academics with concepts, analyses, and broad international networks of experts who can assist in the successful implementation of infrastructure investments.
  - addressing the local, regional, and global challenges impacting Turkish cities requires a continuous program to build and enhance capacity across a range of disciplines including design, management, forecasting, technical analysis, implementation, regulation, and finance.



# OUTCOMES

- Refinement of the Cities of the Future Methodology
  - Cities of the Future is an outgrowth of an emerging paradigm that considers infrastructure services and land use choices in an integrated fashion.
  - A repeatable methodology will be developed during the Turkish Cities of the Future that can guide cities throughout the world. This framework will bring rigor and consistency to the process and will be a valuable contribution to global best practice.



# OUTCOMES

- Enhancing Turkey's Competitive Position as a Provider of Water Services
  - Turkey has natural advantages to become a global leader in water services:
    - strategic location at the crossroads of Europe, Asia, and the Near East
    - close adjacency with water short nations
    - significant infrastructure investments pending within Turkey that can finance and spur Turkish innovation, practice, and implementation.



# METHODOLOGY

- **Four Phase Approach**

- Initiation, Pre-Planning, Planning
- Development of Supporting Information
- Strategic Water Management Plans for Three Cities
  - 6 Strategic Workshops in 3 cities
  - 3 Special Topic Workshops
- Dissemination of Results
  - Cities of the Future International Conference, *Istanbul 2013*  
A book entitled “*Making Cities of the Future a Reality*”



# Initiation and Pre-Planning Activities

- Discussions to explore a potential collaboration between
  - Prof. Hasan Zuhuri Sarikaya, Under Secretary of MoEF,
  - Paul Reiter, IWA Director &
  - Glen Daigger, IWA President-Elect.
- Pre-planning visits in the three cities: 8- 13 February, 2010
  - Prof. Dr. Glen Daigger, President-Elect of IWA,
  - Steve Moddemeyer, Project Manager for IWA's CoF Program
  - Rüya Taşlı Toraman, Istanbul Technical University, President of TNC
  - Dr. Özlem Karahan, Istanbul Technical University, Executive Secretary of TNC
  - Prof. Dr. Orhan Yenigun, Bogazici Institute of Environmental Sciences, IWA representative for Turkey, and
  - Bengü Özge Şerifoglu, MoEF.



# Development of Supporting Information

- The pre-planning team developed a list of issues that were common and unique to the cities
- These issues were gathered under the general categories:
  - Drought-Proof Water Supply
  - Urban Stormwater Management
  - Resource Efficiency
  - Efficient Management
  - Performance Relative to World Standards
  - Ambient Water Quality.



# PLANNING(3 year work program)

CITIES OF THE FUTURE TURKEY WORKSHOP PROGRAM 2010

## *STRATEGY WORKSHOP #1: KAYSERİ*

July 26-28, 2010

## *STRATEGY WORKSHOP #2: TRABZON*

July 29-31, 2010

## *SPECIAL TOPIC WORKSHOP #1: ISTANBUL*

October 25, 2010

## *STRATEGY WORKSHOP #3: ISTANBUL*

October 26-28, 2010



# PLANNING(3 year work program)

CITIES OF THE FUTURE TURKEY WORKSHOP PROGRAM 2011

***SPECIAL TOPIC WORKSHOP #2: ISTANBUL***

*March 2011*

***Follow-on Strategy Development work#4: KAYSERİ***

*June, 2011*

***Follow-on Straytegy Development work#5: TRABZON***

*June, 2011*

***SPECIAL TOPIC WORKSHOP #3: ISTANBUL***

*September, 2011*

***Follow-on Strategy Development work#6: ISTANBUL***

*September, 2011*





# SPECIAL TOPIC WORKSHOPS

- ***SPECIAL TOPIC WORKSHOP #1:***

***CLIMATE CHANGE ADAPTATION IN TURKEY*** – October, 2010

- Climate Change Adaptation, Source Water Protection, Groundwater Recharge, Water Sensitive Urban Design, Source Water Protection, Stormwater Management, Energy Efficiency, Energy Supply

- ***SPECIAL TOPIC WORKSHOP #2:***

***EMERGING ISSUES IN WASTEWATER TREATMENT*** - March, 2011

- Wastewater Treatment, Industrial Waste Management, Biosolids Management, Staged Approach to Wastewater Management

- ***SPECIAL TOPIC WORKSHOP #3:***

***UTILITY MANAGEMENT IN A TIME OF CHANGE*** – September, 2011

- Utility Management, Non-Revenue Water, Benchmarking



# PLANNING(3 year work program) CITIES OF THE FUTURE TURKEY WORKSHOP PROGRAM 2012

Continue to implement strategies and conference  
activities 2012

Cities of the Future International Conference,  
*Istanbul 2013*



# STRATEGIC WATER MANAGEMENT PLANS WORKSHOP OUTLINE

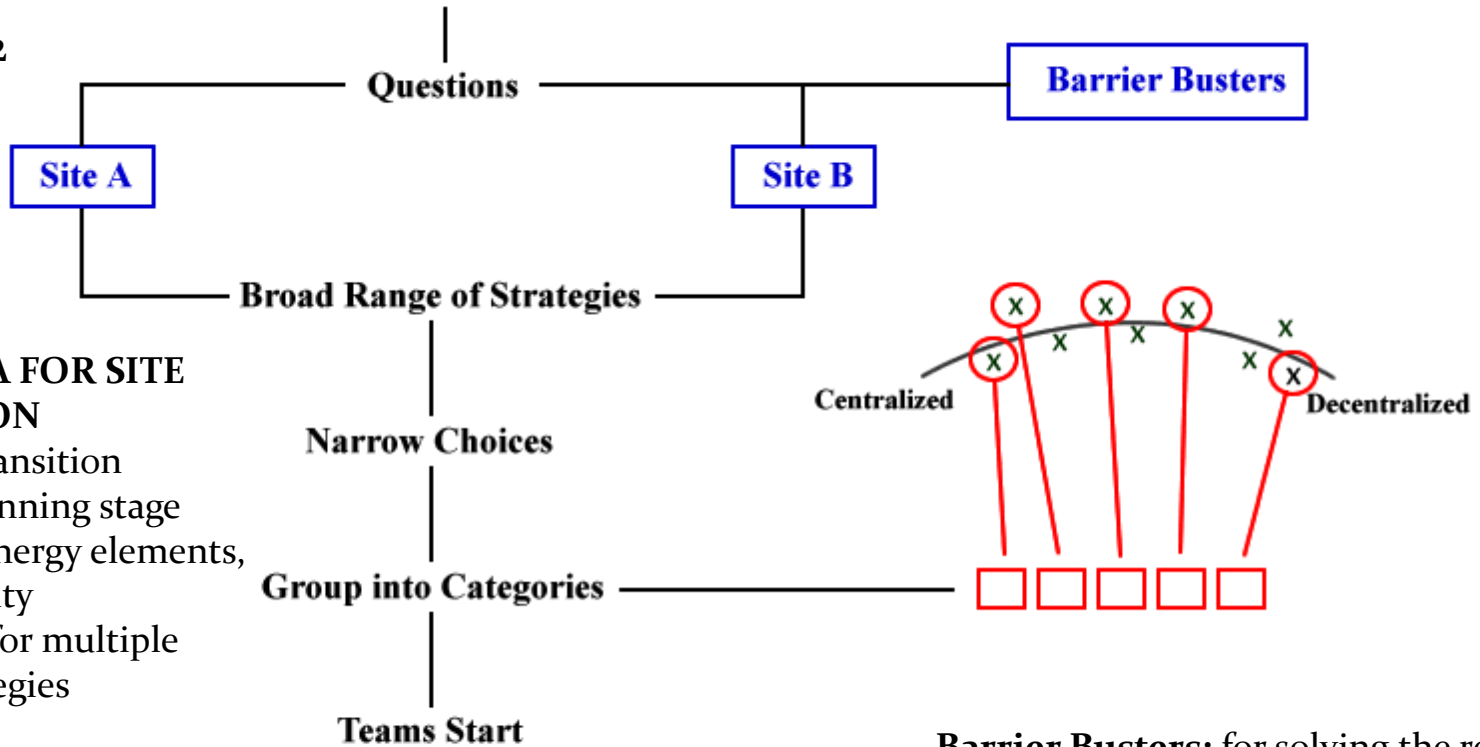
- 3 day workshops are planned:
- Day 1
  - ❖ Overview of Turkish Cities of the Future and specific issues to be addressed
  - ❖ Local government presentations on water supply, wastewater, stormwater issues and opportunities, land use, economic development, and population growth, energy & climate
  - ❖ Presentations of international experts
  - ❖ Technical site visits



# STRATEGY WORKSHOP OUTLINE

## Overview of Assignments & Sites

Day 2



### CRITERIA FOR SITE SELECTION

- Area in Transition
- Still in planning stage
- Water & energy elements,
- Accessibility
- Potential for multiple uses/strategies

1. *Potential Strategies*
2. *Economic Rationale*
3. *Community Impacts*
4. *Environmental Consequences*
5. *Goals/Objections*
6. *Action Steps*
7. *Implementers*
8. *Budget*
9. *Schedule*

**Barrier Busters:** for solving the regulatory problems (land use experts, energy expert, water experts- to search for if there is any obstacle for implementation and work to solve the problem – change regulations??)

# STRATEGY WORKSHOP OUTLINE

- Day 3 – Workshop participants present results of working sessions including strategies, economic rationale, community impacts, environmental consequences, community readiness, goals, objectives, action steps, implementers, budget, and schedule.
  - Presentations Team 1
  - Discussions/Questions
  - Presentation Team 2
  - Discussions/Questions
  - Overall Discussion
  - Next steps

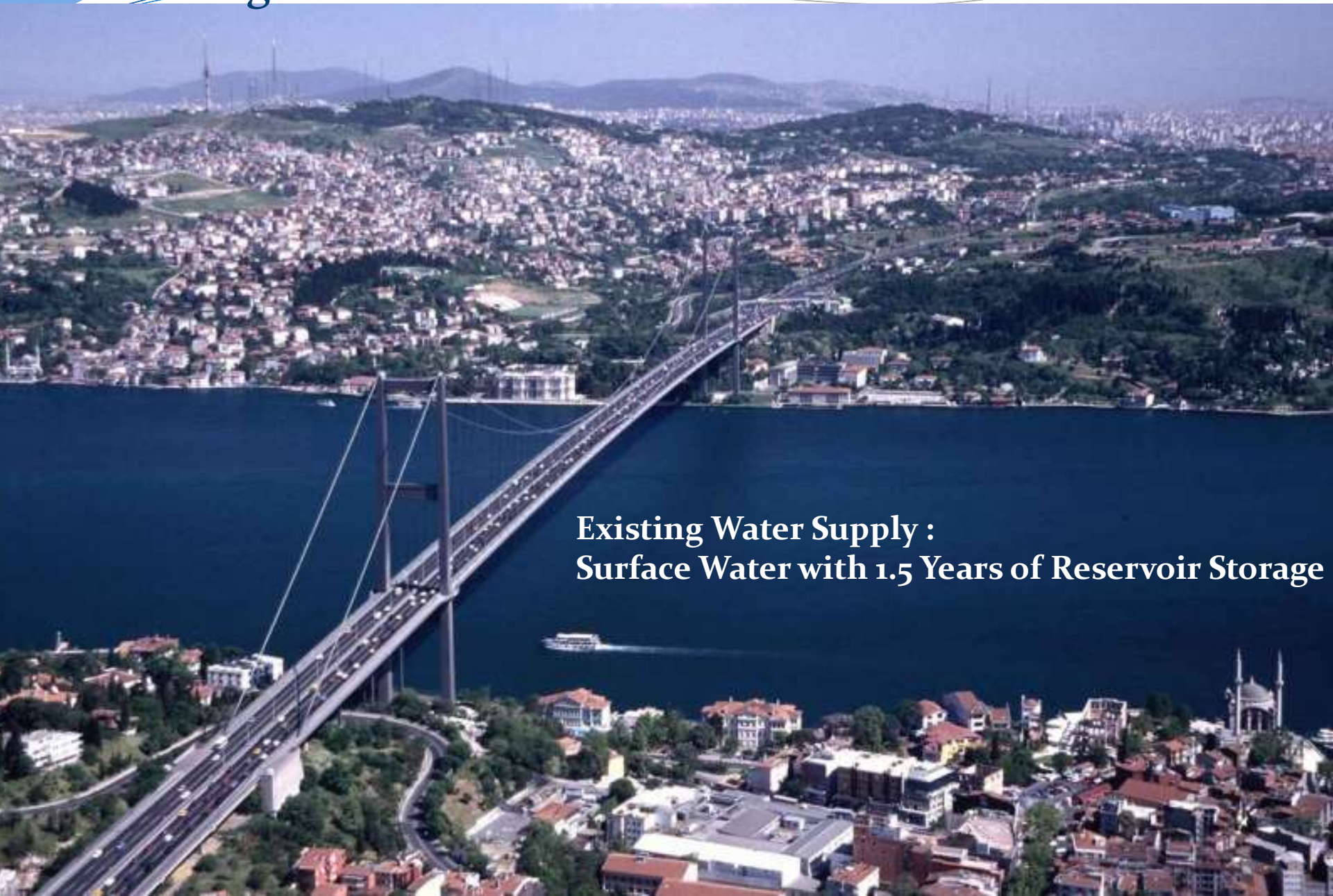


# TURKISH CITIES' FEATURES



**ISTANBUL**

**Growing From Current ~13 Million to ~16 Million**



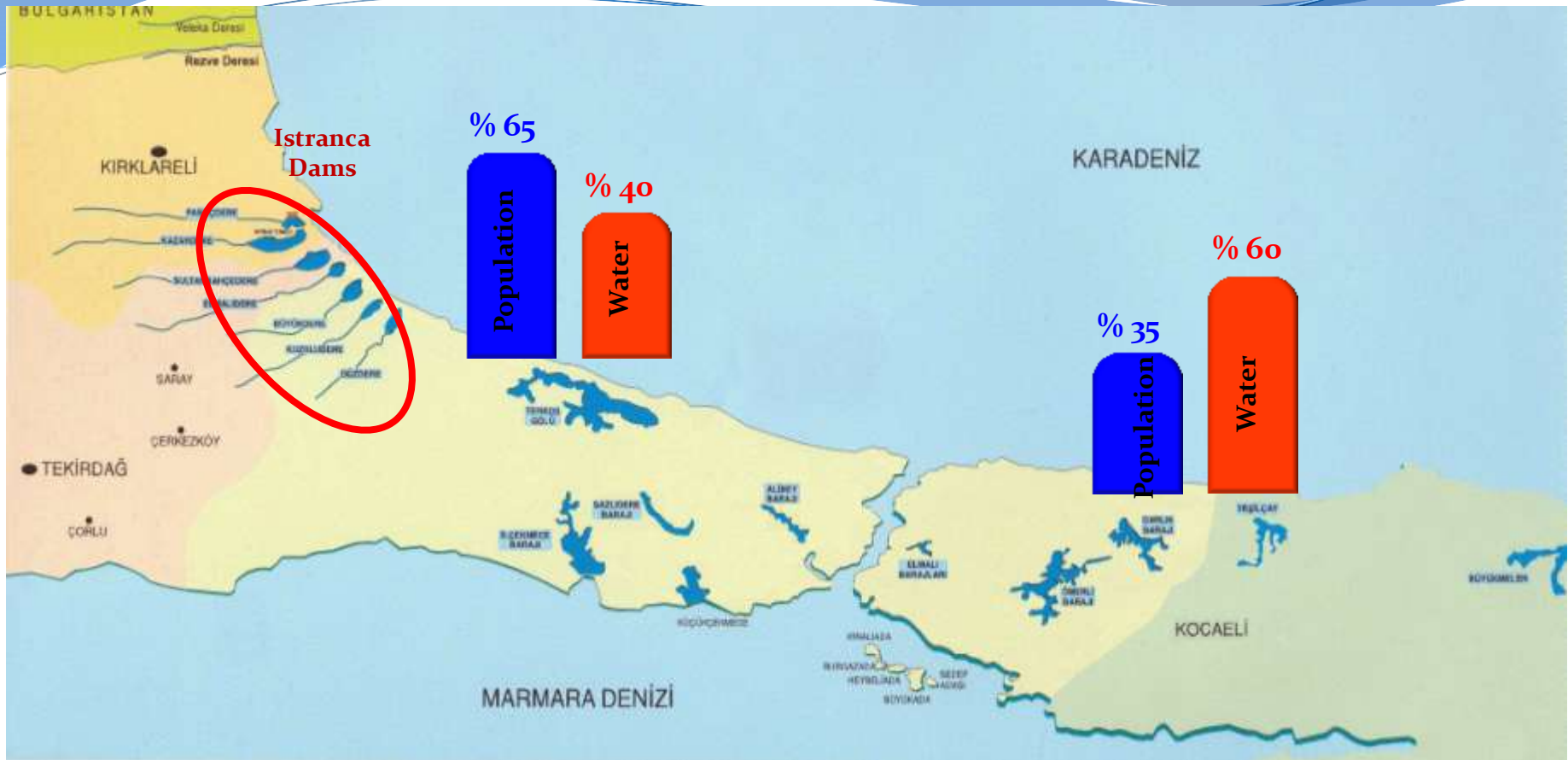
**Existing Water Supply :  
Surface Water with 1.5 Years of Reservoir Storage**

# Key Figures on Water Supply for İstanbul

- **Population served** : 12,9 million
- **Total area served** : 5.453 km<sup>2</sup>
- **Total number of customers** : 4,8 million
- **Total length of water networks** : 16.234 km
- **Total length of sewers** : 13.569 km
- **Annual yield of water resources** : 1.353 million m<sup>3</sup>/year
- **Average daily water supply** : 2.000.000 m<sup>3</sup>/day
- **Volume of Water Reservoirs** : 1.428.280 m<sup>3</sup>

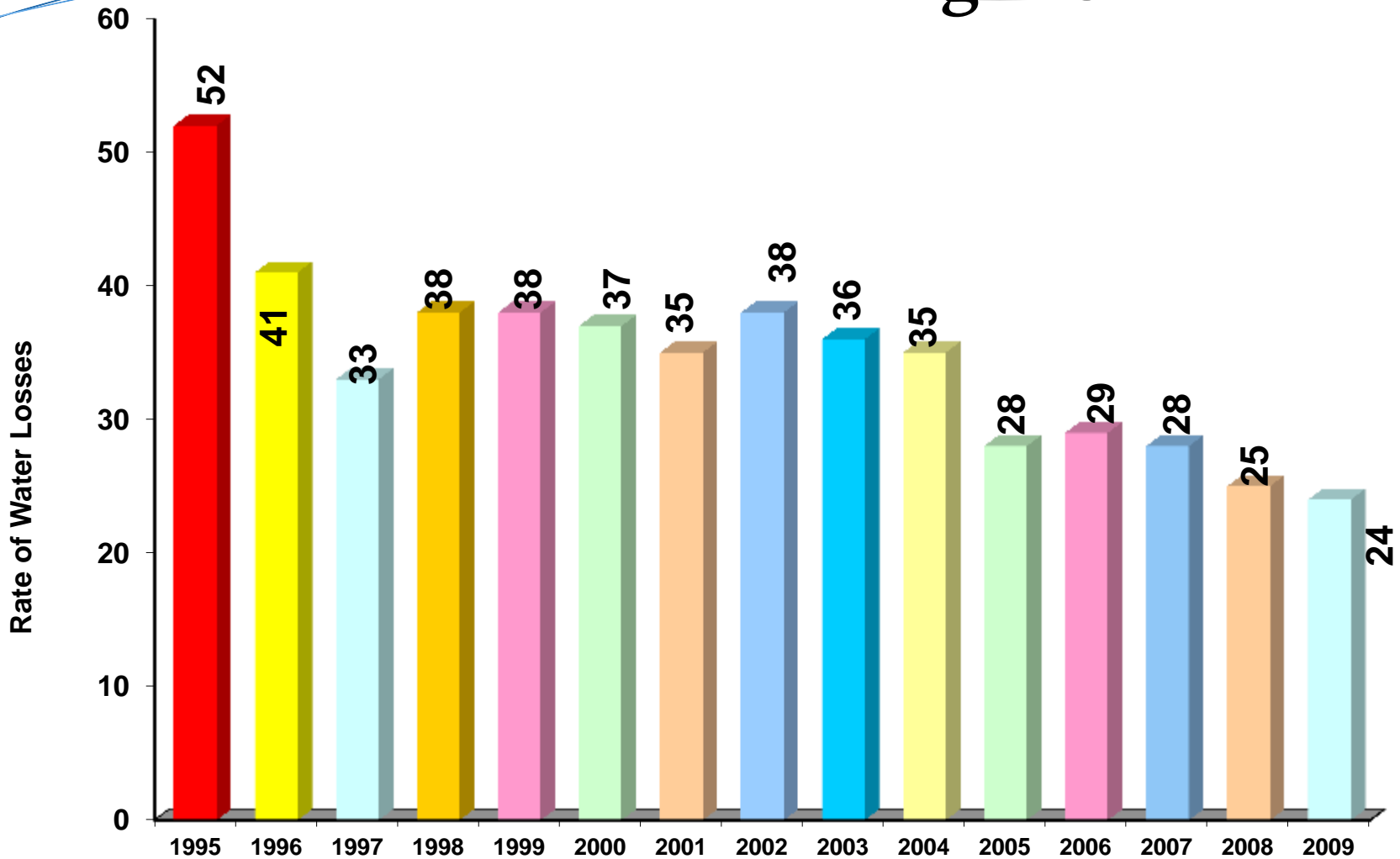


# Existing Water Resources of Istanbul



- Almost 100 % of drinking water in Istanbul is provided from surface waters.
- 60% of water resources are on the Asian side with 35% of population while 40% exist on the European side with 65% of the population.

# Water Losses and Illegal Uses

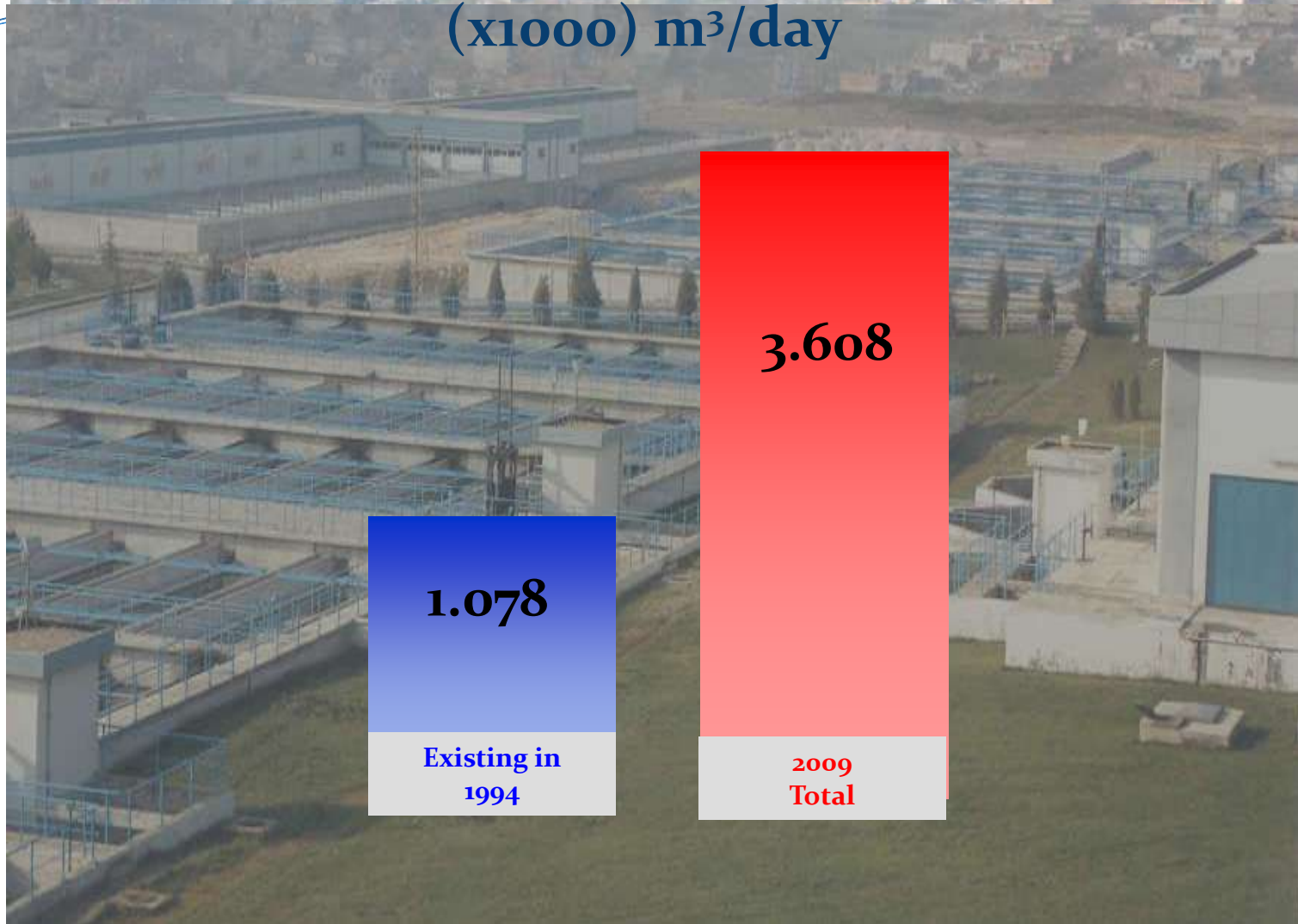


➤ One of the most important problems of big cities is water losses and illegal uses.

Water losses and illegal use of water in Turkey is about 50%. This rate is 24% in İstanbul.

# Capacity of Water Treatment Plants

(x1000) m<sup>3</sup>/day



In 16 years, capacity of water treatment plants increased from 1 million m<sup>3</sup> daily to 3.6 milyon m<sup>3</sup>.

# Water Resources and Basin Protection



Sultanbeyli - Omerli

**Rapid urbanization and industrialization lead to the pollution of water resources and make it difficult to protect them. Also they threaten public health and put forward the need for new precautions to protect raw water quality.**

# Negative Effects of Climate Change



## Drought and Floods



- Due to the heaviest rainfall of the last 50 years; sudden floods have occurred in İstanbul recently
- Consequently İstanbul faced with severe situations that threatened life and property security.

# Opportunities for Istanbul

- Incorporate Local Stormwater Management and Water Reclamation and Reuse Into New Development and Redevelopment Areas to Increase Drought Resilience of Water Supply and Relieve Stress on Wastewater System.
- Develop Biosolids Master Plan with Improves System Reliability and Reduces Energy Requirements
- Implement Enhanced Trade Waste Management Procedures to Reduce Impacts on Existing Wastewater Treatment Plants
- Continue Non-Revenue Water Reduction Program
- Benchmark System, Both Metric and Process

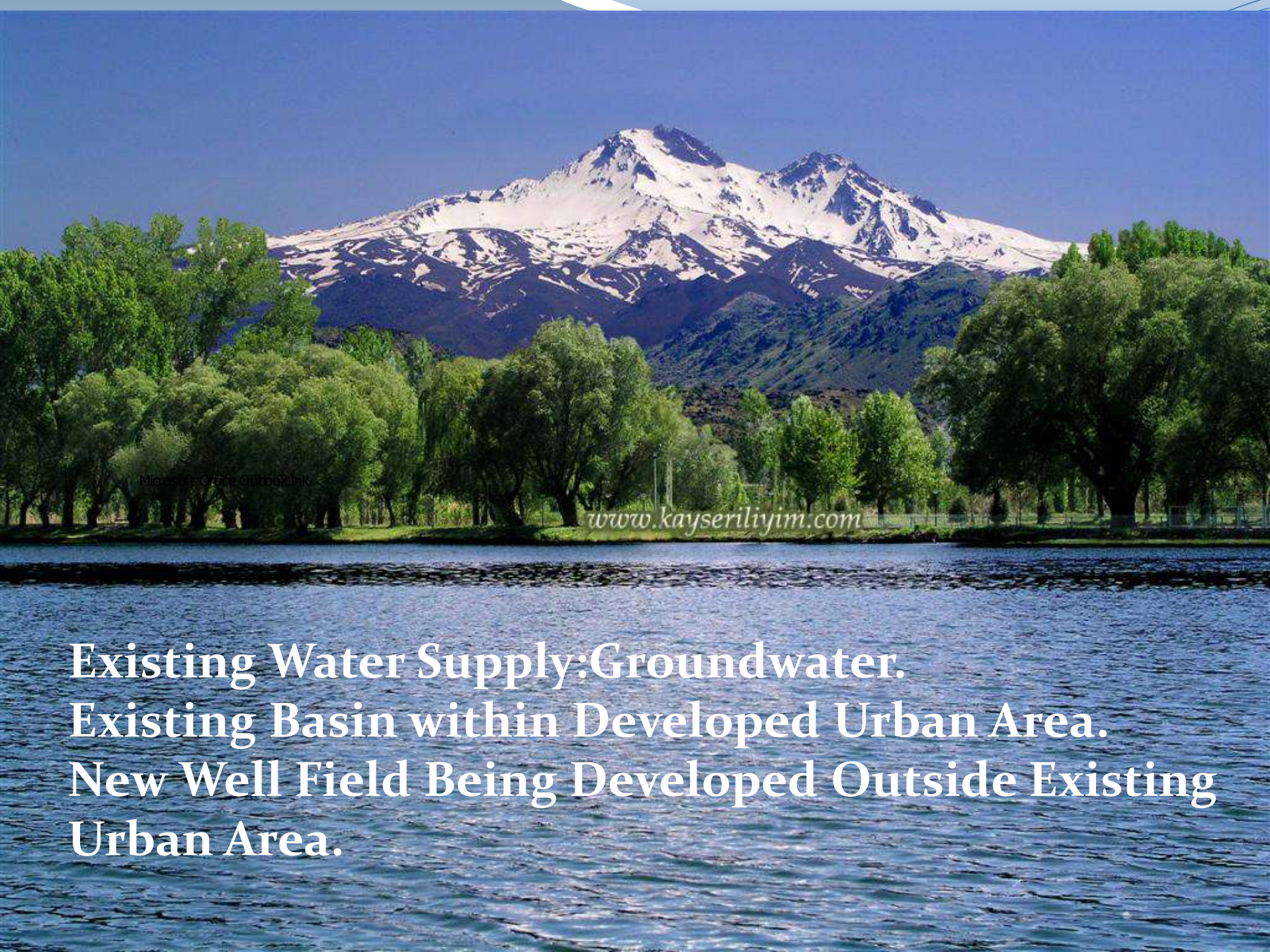
KAYSERI

1.2 Million Current, Growing to ~ 2.2 to 2.5 Million

[kayseriilgiyim.com](http://kayseriilgiyim.com)







Existing Water Supply:Groundwater.  
Existing Basin within Developed Urban Area.  
New Well Field Being Developed Outside Existing  
Urban Area.

# Stadium as an alternative site for stormwater harvesting



## KAYSERI WATER SUPPLY FIGURE (mainly groundwater resources)

<b>YEARS</b>	<b>Water Amount Supplied</b>	<b>Revenued</b>	<b>Water Lost</b>
<b>2006</b>	50,569,917 m3	42,113,032 m3	16.72%
<b>2007</b>	51,748,651 m3	42,992,345 m3	16.92%
<b>2008</b>	53,282,373 m3	44,385,200 m3	16.70%
<b>2009</b>	54,442,085 m3	45,363,922 m3	16.67%

# Opportunities for Kayseri

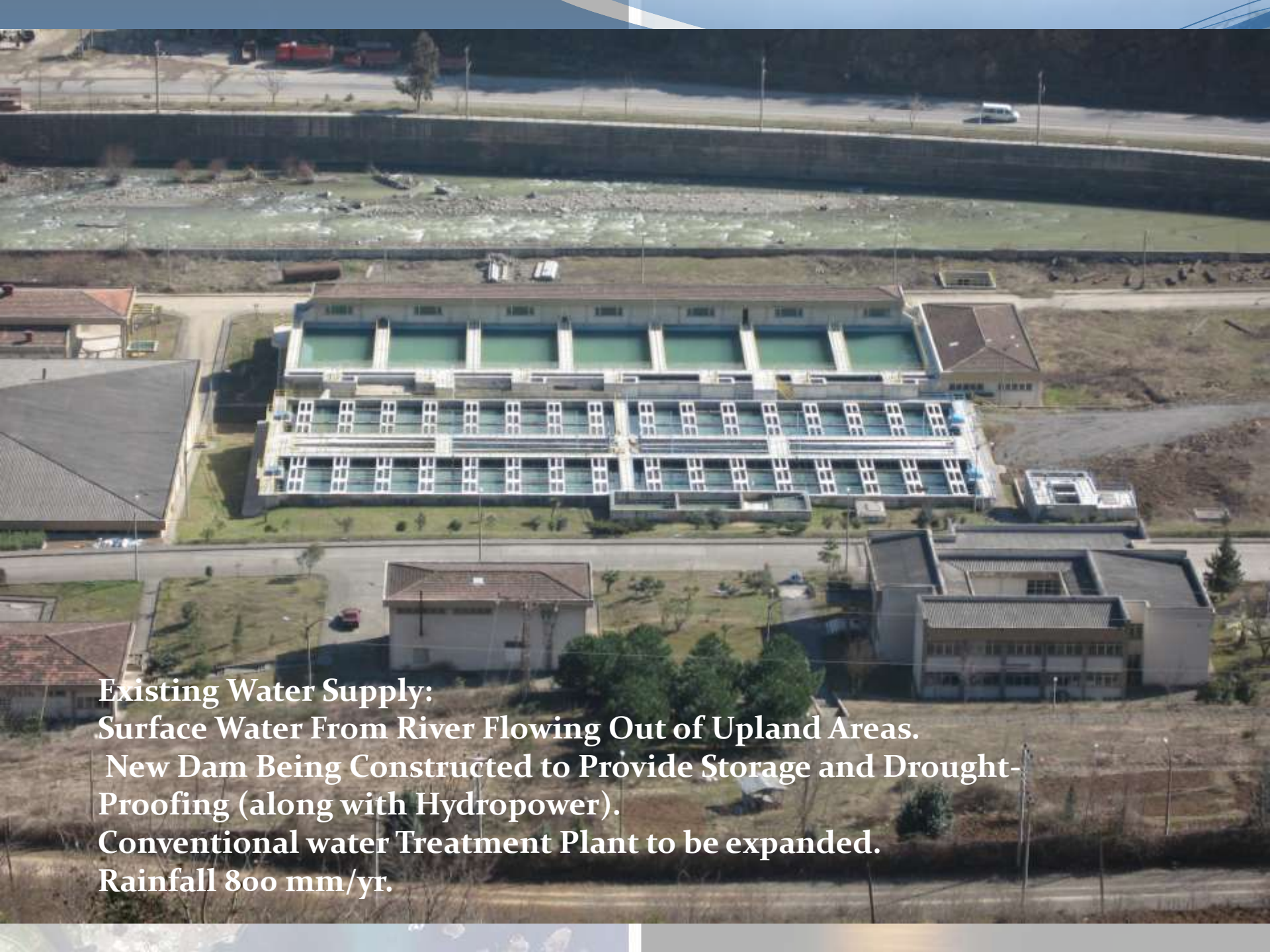
- Use Rainwater Harvesting/Local Stormwater Management, along with Water Reclamation and Reuse, to Supplement Existing Groundwater Supply. Will Improve Drought Resilience of Water Supply and Relieve Stress on Wastewater System
- Use City Museum and Other Civic Venues to Educate Public About Water
- Address Biosolids and Solid Waste Issues in Integrated Fashion
- Improve Energy Efficiency of Entire System
- Capitalize on Industrial Wastewater Treatment System Currently Being Implemented to Position Kayseri for Further Industrial Growth

# Trabzon

750,000 Current

High fluctuation between summer and winter seasons





**Existing Water Supply:  
Surface Water From River Flowing Out of Upland Areas.  
New Dam Being Constructed to Provide Storage and Drought-  
Proofing (along with Hydropower).  
Conventional water Treatment Plant to be expanded.  
Rainfall 800 mm/yr.**

# Opportunities for Trabzon

- **Reduce Non-Revenue Water**
- **Incorporate Stormwater Management Into On-Going Development**
- **Introduce Concept of Water Sensitive Urban Design, Including into On-Going Floodway Restoration Work Through This Bring “Water” Into the Life of the City**
- **Provide Staged Approach to Wastewater Management to Enhance Local Waterways, Protect Black Sea, and Create Bathing Opportunities**
- **Tie Water Into the Historical and Cultural Themes of the City to Increase Public Appreciation for Water**



For adaptable, predictable and flexible strategies  
No hard dates are set, incremental planning, resilience

Hope to see you in Istanbul  
Cities of the Future International  
Conference, *Istanbul 2013*