Water Management in Turkey

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Head of the Basin Management Department
(DG Water Management, Ministry of Forestry and Water Affairs)
GENERAL INFORMATION ABOUT TURKEY

- Surface area ~ 784,000 km²
- Population ~ 74,000,000 people
- 7 geographical region
- 81 provinces
- Capital City → Ankara
## WATER POTENTIAL IN TURKEY

<table>
<thead>
<tr>
<th>Description</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Annual Precipitation</td>
<td>501 billion m³</td>
</tr>
<tr>
<td>Annual Usable Surface Water</td>
<td>98 billion m³</td>
</tr>
<tr>
<td>Annual Usable Ground Water</td>
<td>14 billion m³</td>
</tr>
<tr>
<td>Annual Total Usable Water</td>
<td>112 billion m³</td>
</tr>
<tr>
<td>Population of Turkey (2010)</td>
<td>74 million</td>
</tr>
<tr>
<td>Annual Water Amount per person</td>
<td>1500 (m³/person-year)</td>
</tr>
</tbody>
</table>
WATER POTENTIAL IN TURKEY

Irrigation: 32 billion m³ (%73)
Drinking Water: 7 billion m³ (%16)
Industrial Water: 5 billion m³ (%11)
Total Used Water: 44 billion m³
Usage Ratio of Water Potential: (%40)
Annual Water Amount per person: 1500 (m³/person-year)
# TURKEY:
Not a **WATER-RICH** Country

## Annual Water Amount per person (m³/year)

<table>
<thead>
<tr>
<th>COUNTRIES</th>
<th>2005</th>
<th>2023</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water-Rich Countries</td>
<td>10.000+</td>
<td>8.000+</td>
</tr>
</tbody>
</table>

*(Canada, ABD, North and West European Countries)*

<table>
<thead>
<tr>
<th>Country</th>
<th>2005</th>
<th>2023</th>
</tr>
</thead>
<tbody>
<tr>
<td>Iraq</td>
<td>2.110</td>
<td>1.400</td>
</tr>
<tr>
<td>Turkey</td>
<td>1.600</td>
<td>1.300*</td>
</tr>
<tr>
<td>Syria</td>
<td>1.420</td>
<td>950</td>
</tr>
<tr>
<td>Israel</td>
<td>300</td>
<td>150</td>
</tr>
<tr>
<td>Jordan</td>
<td>250</td>
<td>90</td>
</tr>
<tr>
<td>Palestine</td>
<td>100</td>
<td>40</td>
</tr>
</tbody>
</table>

* Estimated calculation made as population of Turkey will be approximately 85 million in 2023.
Turkey’s water challenge

Estimated national water body status, 2009

- High
- Good
- Moderate
- Poor
- Bad
Opening of Turkish – EU negotiations on the Environment chapter on 21 December, 2009,
Turkey as EU candidate member
Opening negotiations on the Environment Chapter on 21 December 2009

Two closing benchmarks for water:
- Transposition of WFD
- River basin management plans for 25 river basins
Transposition of Water Framework Directive

- Revising the existing legislation
- By-Law on River Basin Protection (Draft)
- Water Law*
  - By-law on River Basin Protection
1. A meeting was held in Sapanca with Water and Sewarage Administrations
2. A meeting was held with University representatives
3. Laws of 10 countries were reviewed
4. Comparisons between laws was made with foreign experts
5. 2-days workshop was held with the participation of 150 representatives
6. Draft law was presented to 73 agencies and institutions, university, NGOs and municipalities for evaluation.

7. Senior representatives of agencies and institutions, NGOs and industrialist (YÖNETDER) were come together

8-Received comments are being evaluated.

9- DEA has been drafted.
River basins in Turkey
Büyük Menderes River basin
We have started to monitor water quality according to EU standards. We are developing effective measures via monitoring focused on pollution sources basin wide. We are developing more effective measures by basin wide monitoring focused on pollution sources. We will identify monitoring points in 25 basins in 2011 according to EU standards.
Status of surface water bodies
Water body status in the Büyük Menderes river basin

- Good: 33%
- Moderate: 45%
- Poor: 12%
- Bad: 8%
- Waste Water Treatment Action Plan
- River basin Protection action plans
- River Basin Management Plans
STATUS OF BASIN PROTECTION ACTION PLANS

- **Completed**
- **Going to be revised**
- **Start in last quarter of 2011**
Analysis of current situation in the basin

25 Basins

River Basin Protection Action Plans (RBPAPs)
- to be prepared
- Public participation

Improvement of water quality

Chemical assessment
- Point sources, diffuse sources, pollution loads originating from leachates, and the assessment of total pollution loads
- Classification of water quality

Water potential of the basin
- Existing water use
- Planning status
- Status of re-use of treated waste water / Planning proposal
- Estimation of water demands

Current and planned status of water resources

Hot spots

Programme of measures

Basin Protection Action Plans

Collection of data on water quality from related institutions

Spots that need to be handled urgently
- Basin specific problems
- Special provisions for drinking water areas, e.g. Olive oil sector, sediment transportation, atmospheric deposition, geothermal waters, mining

Existing data are assessed

Proposals for monitoring network

Pressures and impacts (industrial, domestic, diffuse)
- Status of infra-structure
- Climate conditions
- Water resources
- Settlements
- Solid waste disposal situation
- Protected areas
- Agriculture and livestock
- Land use
- Afforestation, erosion and pasture improvement

Measures to be taken are defined
- Short- medium- and long-term measures are scheduled
- Short-term measures to be taken by the municipalities for waste water treatment plants and emergency measures are examined and planned
- Public participation

Draft prepared, public participation ensured
- Final version published
- The responsibilities of institutions are defined
Basin Protection Action Plans
Distribution of Average Precipitation in Basins
Basin Protection Action Plans
Land Use in Basins
Basin Protection Action Plans
Protected Areas
Basin Protection Action Plans
Average Temperature Distribution
Basin Protection Action Plans
Water Resources in Basins
Basin Protection Action Plans
Locations in the basins
Basin Protection Action Plans
Land Works - Designation of Environmental Infrastructures
Basin Protection Action Plans
Status of Solid Waste Disposal in Basins-Planning
Water Quality

- **Gökirmak ve Devrez Streamlets**
  - COD, BOD: 1-2
  - NH₃-N: 2
  - Total P: 2-3

- **Acıçay River**
  - BOD: 3-4
  - NH₄-N: 4
  - NO₃-N: 1-2
  - Total P: 3-4

- **Delice Streamlet**
  - BOD: 2
  - NH₄-N: 4
  - NO₃-N: 3
  - Total P: 2

- **Kızılırmak**
  - COD: 1-2
  - BOD: 2-3
  - NH₄-N: 2-4
  - NO₂-N: 3-4
  - NO₃-N: 1-2
  - Total P: 2-4

- **Kırşehir Streamlet**
  - COD, BOD: 4
  - NH₄-N: 4
  - Total P: 4

- **Sarımsaklı Water (Karasu)**
  - BOD: 2-4
  - NH₄-N: 3-4
  - Total P: 4

- **Kıırıkça Streamlet**
  - COD, BOD: 1-2
  - NH₃-N: 2
  - Total P: 2-3
## Schedule for Basin Protection Action Plans

<table>
<thead>
<tr>
<th>PROJE - FAALİYET</th>
<th>YİLLAR</th>
<th>UYGULAYICI</th>
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<tbody>
<tr>
<td></td>
<td>KISA VADE</td>
<td>ORTA VADE</td>
</tr>
<tr>
<td><strong>1. HAVZA KORUMA EYLEM PLANI STRATEJİSİNİN OLUŞTURULMASI</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>2. KURUM VE KURULUŞLARIN KOORDİNASYONUNUN SAĞLANMASI</strong></td>
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<tr>
<td><strong>3. ATIKSU YÖNETİMİ</strong></td>
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<tr>
<td><strong>3.1. Kentsel Atıksu Altyapı Yönetimi</strong></td>
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<tr>
<td><strong>3.1.1. Belediyeler (N&gt;100.000)</strong></td>
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<td>Çorum/Merkez</td>
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<tr>
<td>AAT Rehberlik Yapılması</td>
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<td>İzleme ve Denetim</td>
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<td><strong>Samsun/İlçalar</strong></td>
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<tr>
<td>İzleme ve Denetim</td>
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</tr>
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</table>
EXAMPLE
ERGENE RIVER BASIN

- Ergene River originates from Istranca Mountain in Tekirdağ City.
- It flows into River Meriç, and then flows to the Saroz Gulf.
- The whole length of the river is 283 km and it has 11,000 square kilometers of river basin.
- The water potential of Ergene River is 1.71 billion cubic meters per year.
- 12% of wheat, 61% of sunflower and 54% of rice productions of Turkey are being produced in the basin.
**ACTIONS VIA ERGENE RIVER BASIN ACTION PLAN**

**Action 1.** Works on rehabilitation of stream beds are going on.

**Action 2.** Municipal waste water treatment plants are being constructed by Directorate General for State Hydraulic Works.

**Action 3.** Rehabilitation Organized Industrial Zones are established

**Action 4.** Advanced joint waste water treatment plants for industry are being constructed.

**Action 5.** Processing less polluting raw materials and using less water are being started.

**Action 6.** Works on afforestation and combating soil erosion are going on.

**Action 7.** It is being entered into planned era in Ergene, 1/25,000 plans are being implemented.
**ACTIONS VIA ERGENE RIVER BASIN ACTION PLAN**

**Action 8.** Solid and hazardous waste processing, recovery and disposal plants are being established.

**Action 9.** Pollution from agriculture will be controlled.

**Action 10.** Ergene River is going to be monitored online continually.

**Action 11.** Intimate inspections are going on.

**Action 12.** Practicing environmental friendly production has been started.

**Action 13.** Early warning system against floods is being established.

**Action 14.** Ground water consumption is being controlled.

**Action 15.** Dams, ponds, irrigation facilities are being constructed.
Determination of Special Provision studies are being conducted for the protection of drinking water basins.
Project titled “Capacity Building on Water Quality Monitoring” was submitted to the Component I of IPA for the Programming Year 2009.

UNDER THE SCOPE OF 4.000.000 EURO EU TWINNING PROJECT IN BÜYÜKMENDERES ERGENE SUSURLUK SAKARYA AKARÇAY BASINS

DETERMINATION OF MEASURING STATIONS, PARAMETERS WHICH WILL BE MEASURED AND MEASUREMENT INTERVALS
Water Database of the Ministry of Forestry and Water Affairs

DG Meteorology
DG State Hydraulic Works
USBS (National Water Information System)
DG Mineral Research and Exploration
Maden İşleri Genel Müdürlüğü
Governorates (Special Provincial Administrations)
Ministry of Food, Agriculture and Livestock
Other related institutions and organizations
Municipalities
Sectoral Water Allocation
FLOOD AND DROUGHT PLANS

Flood management plans are being prepared

Flood Protection Action Plans start in the West Black Sea Region.

Strategies for dry periods are being identified.

The impacts of climate change are being identified.
Natural Basin Management Strategic Document

By National Management Strategic Document;

• Enhancing legal and institutional capacity, maintaining the ordination and cooperation between related institutes for sustainable management of basins.
• Sustainable management and usage of water resources in basins.
• Preventing erosion and devastation of natural resources and basin areas, rehabilitation and maintaining sustainable usage in damaged basin areas.
• Protection of biological variety and landscape and maintaining sustainable usage of basins.
• Increasing the living quality and welfare of people in basins.
• Developing fighting mecanisms for natural disasters due to damaged natural resources in basins.
• Adding the probable effects of climate changing in basin management and developing harmonizing mechanisms.

Are aimed
WATER CONSERVATION ACTION PLAN (WCAP)

1. Reuse of Treated Domestic Wastewater

2. Public Awareness on Saving Water

3. Reduce Water Loss and Leakage Ratios
## Planning for river basin management plans

<table>
<thead>
<tr>
<th>Action</th>
<th>Year</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Designation of River Basin Districts</td>
<td>2012</td>
<td>25 basins have already been defined.</td>
</tr>
<tr>
<td>2 Start preparing the Article 5 Reports for River Basins</td>
<td>After 2013</td>
<td>River Basin Protection Action Plans (RBPAP) will set the basis for Article 5 reports</td>
</tr>
<tr>
<td>3 Start preparing the river basin management plans</td>
<td>After 2014</td>
<td></td>
</tr>
<tr>
<td>4 Start of implementation of river basin management plans</td>
<td>After 2015</td>
<td></td>
</tr>
<tr>
<td>5 Achievement of “good water status”</td>
<td>2027</td>
<td>Depends on the actual challenges in the basins.</td>
</tr>
</tbody>
</table>
SOME OF THE WATER RELATED INSTITUTIONS IN TURKEY – EXISTING STRUCTURE

PRIME

MINISTRY FOR DEVELOPMENT

MINISTRY OF FORESTRY AND WATER AFFAIRS
• DG Water Management
• DG for Combat against Desertification and Erosion
• DG for Nature Conservation and National Parks

MINISTRY OF FOOD, AGRICULTURE AND LIVESTOCK
• DG Agricultural Reform
• DG Fisheries and Aquaculture

MINISTRY OF ENERGY AND NATURAL RESOURCES
• DG Mineral Research and Exploration

MINISTRY OF ENVIRONMENT AND URBANISATION
• DG Environmental Management
• DG EIA, Licenses and Inspection
• DG Disaster Affairs

MINISTRY OF INTERIOR
• DG Local Administrations
• DG Provincial Administrations

MINISTRY OF HEALTH
• Directorate of Public Health
• Directorate of Health Group

MINISTRY OF CULTURE AND TOURISM
• DG Promotion

MINISTRY OF INTERIOR
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• Directorate of Health Group

MINISTRY OF CULTURE AND TOURISM
• DG Promotion
GENERAL DIRECTORATE OF WATER MANAGEMENT

- Basin Management Planning Department,
- Water Legislation and Policy Department,
- Inventory and Allocation Department,
- Water Quality Management Department,
- Monitoring department,
- Flood and Drought Management Department,
- Management Services department,
Responsibilities and Roles in Basin Management

Coordination, Policy and Legislation

**PLANNING**

- **Water Use**
  - Agriculture, Drinking Water, Hydropower, Industry etc.
  - Control, Protection
  - Quality, Quantity
- **Investments on Water**
  - Dams, dikes, weirs, pumping stations, water beds etc.

**EVALUATION**

- Licenses, incentives
- Operational water management, permits, monitoring, execution, inspection
- Operation&Maintenance, Construction

Integration with other policies
Policy making and implementation can be integrated or separated, with concentration of tasks at national or regional level.
Water Management Coordination Board has been established by the Circular of the Prime Ministry no 2012/7.
<table>
<thead>
<tr>
<th>NGOS</th>
<th>UNIVERSITIES</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Minister of Forestry and Water Affairs</strong></td>
<td><strong>Undersecretary of the Ministry of EU Affairs</strong></td>
</tr>
<tr>
<td><strong>Undersecretary of the Ministry of EU Affairs</strong></td>
<td><strong>Undersecretary of the Ministry of Science, Industry and Technology</strong></td>
</tr>
<tr>
<td><strong>Undersecretary of the Ministry of Environment and Urbanization</strong></td>
<td><strong>Undersecretary of the Ministry of Foreign Affairs</strong></td>
</tr>
<tr>
<td><strong>Undersecretary of Energy and Natural Resources</strong></td>
<td><strong>Undersecretary of Food, Agriculture and Livestock</strong></td>
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<tr>
<td><strong>Undersecretary of the Ministry of Interior</strong></td>
<td><strong>Undersecretary of the Ministry of Development</strong></td>
</tr>
<tr>
<td><strong>Undersecretary of the Ministry of Culture and Tourism</strong></td>
<td><strong>Undersecretary of the Ministry of Health</strong></td>
</tr>
<tr>
<td><strong>Director General of State Hydraulic Works</strong></td>
<td><strong>Director General of Water Management</strong></td>
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<tr>
<td><strong>Director General of Nature Conservation and National Parks</strong></td>
<td><strong>Director General of Combat Against Desertification and Erosion</strong></td>
</tr>
<tr>
<td><strong>Director General for Meteorology</strong></td>
<td><strong>Director of Water Institute of Turkey</strong></td>
</tr>
</tbody>
</table>
Implementations will be followed closely with a participatory approach.

An advisor group, composed of academicians and NGOs, will be formed.
Balancing users and protectors
RIVER BASIN MANAGEMENT PLAN
GOOD WATER STATUS

Ecology

Chemistry

Hydro-

Morphology
(Flood, dams, ports, channels, over-abstraction etc)

Development plan/other plan objectives

Water Status

HIGH
GOOD
MODERATE
POOR
BAD
### RBMP TIME TABLE

<table>
<thead>
<tr>
<th>Year</th>
<th>RBMP</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>2009(EU) 2015</td>
<td>1. RBMP</td>
<td>Many Member States will achieve good status at this date</td>
</tr>
<tr>
<td>2015(EU) 2021</td>
<td>2. RBMP</td>
<td></td>
</tr>
<tr>
<td>2021(EU) 2027</td>
<td>3. RBMP</td>
<td></td>
</tr>
<tr>
<td>2027(EU) 2033</td>
<td>4. RBMP</td>
<td></td>
</tr>
</tbody>
</table>

**Exemptions**

Implementation dates foreseen by the Directive
Our planning

We will start preparing River Basin Management Plans in 5 basins (Susurluk, Akarçay, Meriç-Ergene, Konya Kapalı, Büyük Menderes) after 2013.

Under the Institution Building for Pre-Accession (IPA) Programme for 2011, our project proposal of 6.6 million Euro has been approved for the basins named above.
CONCLUSIONS

IN WATER SECTOR

• BASIN APPROACH
• GOOD PLANNING
• GOOD MANAGEMENT
• BALANCING USERS AND PROTECTORS
• ECONOMIC AND SOCIAL- SUSTAINABLE DEVELOPMENT
Thank you for your attention

E-mail: ncicek@ormansu.gov.tr