Water Resources Management

Socio-Economic Perspective

Tami Shor, Deputy Director (Regulation)

Israel Water Authority

April, 2010
Israel is situated at the edge of the desert. Within 200 Km rainfall drops from over 700 mm/year to 150 mm/year. Fluctuations in rainfall are very extreme. Series of drought years are a common Phenomena.
Time series for annual available water volumes in Lake Kinnert

Note the significant decrease in the annual volumes. Givati and Rosenfeld (2007) related the decrease to decrease in rainfall at the Hermon and Golan Heights.
Main National Water Supply System
Complexity of the water distribution system

- Different Sources to the main system: ground water, surface water, desalinated water
- Utilization of the different sources changes based on the hydrologic situation
- Different types of uses from the main system: domestic, agriculture, industry
Annual precipitation at the Golan Heights (Lake Kinnert drainage basin) in respect to annual average
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Annual available water volumes in Lake Kinnert

- 2009/10: 378 MCM
- 2008/9: 220 MCM
- 2007/8: 79 MCM
- 2006/7: 176 MCM
- Avg 1985-2007: 370 MCM
# Potable Water Balance for Years 2007-2009 (MCM)

<table>
<thead>
<tr>
<th></th>
<th>2009</th>
<th>2008</th>
<th>2007</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Initial Storage</strong></td>
<td>176</td>
<td>513</td>
<td>753</td>
</tr>
<tr>
<td><strong>Replenishment</strong></td>
<td>891</td>
<td>826</td>
<td>1059</td>
</tr>
<tr>
<td><strong>Sea Water Desalination</strong></td>
<td>169</td>
<td>141</td>
<td>127</td>
</tr>
<tr>
<td><strong>Brackish Water Desalination</strong></td>
<td>20</td>
<td>14</td>
<td>14</td>
</tr>
<tr>
<td><strong>Drought Actions</strong></td>
<td>80</td>
<td>60</td>
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</tr>
<tr>
<td><strong>Total Supply</strong></td>
<td>1160</td>
<td>1041</td>
<td>1200</td>
</tr>
<tr>
<td><strong>Domestic</strong></td>
<td>661</td>
<td>721</td>
<td>744</td>
</tr>
<tr>
<td><strong>Industry</strong></td>
<td>88</td>
<td>88</td>
<td>88</td>
</tr>
<tr>
<td><strong>Agriculture</strong></td>
<td>359</td>
<td>433</td>
<td>474</td>
</tr>
<tr>
<td><strong>Nature</strong></td>
<td>9</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td><strong>Neighbors</strong></td>
<td>137</td>
<td>130</td>
<td>127</td>
</tr>
<tr>
<td><strong>Total Demand</strong></td>
<td>1254</td>
<td>1378</td>
<td>1440</td>
</tr>
<tr>
<td><strong>Deficit</strong></td>
<td>94</td>
<td>337</td>
<td>240</td>
</tr>
<tr>
<td><strong>Final Storage</strong></td>
<td>82</td>
<td>176</td>
<td>513</td>
</tr>
</tbody>
</table>
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Sea of Galilee
Actions for Closing the Gap Between Supply and Demand – Long Term

- Water saving and efficient use of water.
- Water wells purification and aquifers water quality improvement.
- Increasing capacity of waste water treatment and upgrading effluent quality.
- Desalination.
According to government decisions (between the years 2001-2008) sea water desalination facilities are being built:

**Completed facilities**
- Ashkelon - BOT 105+15 MCM/Y (VID)
- Palmachim - BOO 30+15 MCM/Y (VM)
- Hadera - BOT 100+27 MCM/Y (H2ID)

**In bidding process**
- Ashdod - 100 MCM/Y (TK Mekorot)

**Contract signed**
- Sorek - 150 MCM/Y completion 2013

**Full production**
- Sorek since 9/07
- Ashkelon since 12/05
- Palmachim (30+15)
- Hadera (100+27)

**Production**
- Ashkelon (105+15) since 12/05
- Hadera (100+27) since 12/09

**Overall until 2013 = 600 MCM/Y**
**Until 2020 = 750 MCM/Y**
120 million m3/year Ashkelon plant
45 million m$^3$/year Palmachim plant
Fresh Water used for Agriculture (MCM)
Reused Water for Agriculture (MCM)
Actions for Closing the Gap – Short Term

Drought Actions to Increase the Supply

• Expanding Desalination Plants
• Heightened Monitoring of the Water Resources
• Efficient Use of the Aquifers
Actions for Closing the Gap – Short Term

Water saving and efficient use of water

• Allowing Reduced Water Quotas for Agriculture
• Increasing Water Prices - Excess Consumption Levy
• Rationing Water use for Public Gardening
• Media publications and Teaching activities
• Installation of water saving accessories for domestic purposes
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Water conservation campaign
Domestic Consumption per Capita

- **Average 2007:** 106
- **Average 2008:** 102
- **Average 2009:** 89
# Potable Water Balance for Years 2007-2012

<table>
<thead>
<tr>
<th>Year</th>
<th>Initial Storage</th>
<th>Supply</th>
<th>Demand</th>
<th>Deficit</th>
<th>Final Storage</th>
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<tr>
<td>2007</td>
<td>753</td>
<td>173</td>
<td>1201</td>
<td>284</td>
<td>513</td>
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<tr>
<td>2008</td>
<td>753</td>
<td>173</td>
<td>1201</td>
<td>284</td>
<td>513</td>
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<td>173</td>
<td>1201</td>
<td>284</td>
<td>513</td>
</tr>
</tbody>
</table>

**Initial Storage**

- 2007: 753
- 2008-2012: 753

**Supply**

- Brackish Water Desalination: 141
- Sea Water Desalination: 127
- Drought Actions: 0
- Total Supply: 1201

**Demand**

- Domestic: 744
- Industry: 88
- Agriculture: 474
- Nature: 7
- Neighbors: 127
- Total Demand: 1201

**Deficit**

- 2007-2012: 284

**Final Storage**

- 2007-2012: 513
Thank you.