Policies to Manage Agricultural Groundwater Use

DENMARK

Denmark limited irrigated area is solely depending on groundwater. Groundwater use is managed by regulatory and economic approaches, including a pumping tax. Climate change projections suggest that the country will face drier and hotter conditions, which may call on a more significant reliance on groundwater irrigation.

1. Main national governmental agency responsible for quantitative management of groundwater

<table>
<thead>
<tr>
<th>Institution</th>
<th>Role</th>
</tr>
</thead>
<tbody>
<tr>
<td>The Danish Nature Agency</td>
<td>Legislation, Monitoring, Planning.</td>
</tr>
</tbody>
</table>

2. Status and use of groundwater resources

- Annual groundwater use is estimated 0.75 km$^3$ in 2011.
- Groundwater irrigation area 201 480 ha in 2010.
- Groundwater withdrawals for irrigation 0.247 km$^3$ in 2010.

![Main groundwater withdrawing sectors at the national level](image1.png)

![Groundwater use in agriculture in Denmark (km$^3$)](image2.png)
3. Inventory of national policies affecting agricultural groundwater use

Recent groundwater management reforms

<table>
<thead>
<tr>
<th>Reforms</th>
<th>Year</th>
<th>Scope and objective</th>
<th>Degree of implementation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Danish Water Supply Act.</td>
<td>2013</td>
<td>The purpose of the act is to ensure that use and protection of groundwater happens under a coordinated planning, assessment of an appropriate use of the water resources and an extension of the existing water supply with the aim of achieving an appropriate use of the water resources. Lastly, the act establishes drinking water quality standards for the protection of human health.</td>
<td>Complete</td>
</tr>
</tbody>
</table>

Core groundwater management approaches at national level

Groundwater ownership ► Private and public

Main types of instruments used to manage groundwater use in agriculture

Regulatory approaches

- **Groundwater management plans**
  - Mandated

- **Coordination with surface water management**
  - Systematic

- **Mandated metering or monitoring system for groundwater**
  - Mandated metering for agricultural and other users, these measures are enforced.

Economic instruments

- **Economic instruments to regulate quantity: pricing**
  - There are national taxes on pumped water, which account for environmental externalities.

4. Agricultural groundwater use at the regional level

**Western Jutland**

<table>
<thead>
<tr>
<th>Agro-climatic zone</th>
<th>Climate change prospective (2030-2050)</th>
<th>Surface irrigation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temperate</td>
<td>Wetter, hotter, more frequent droughts</td>
<td>Surface water is available and used for irrigation. Surface water is rarely used.</td>
</tr>
</tbody>
</table>

Characteristics of the main aquifers in the regional unit

Mainly quaternary and pre-quaternary sand and gravel deposits.

<table>
<thead>
<tr>
<th>Type of aquifer</th>
<th>Geological type</th>
<th>Groundwater quality concerns</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mixed</td>
<td>Sand and gravel</td>
<td>Limited</td>
</tr>
</tbody>
</table>
### Total number and Increase in the past 10 years

<table>
<thead>
<tr>
<th>Estimated number of agricultural wells</th>
<th>Total number</th>
<th>Increase in the past 10 years</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>10 900 (2011)</td>
<td>Slow</td>
</tr>
</tbody>
</table>

### Other uses of groundwater

<table>
<thead>
<tr>
<th></th>
<th>Minor</th>
<th>Major</th>
<th>Diminishing</th>
<th>Steady</th>
<th>Increasing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Domestic</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Industry</td>
<td></td>
<td>✓</td>
<td></td>
<td>✓</td>
<td></td>
</tr>
</tbody>
</table>

### Main types of instruments used to manage groundwater use in agriculture

#### Regulatory approaches

**Regulations on wells**
- Approval of new well
  - Accounting for well space restriction
  - With environmental impact assessment
- Groundwater withdrawal restrictions

### 5. Bibliography

#### Institutional websites
- [www.nst.dk](http://www.nst.dk)

#### Official reports

#### Additional sources
- [www.geus.dk; www.vfl.dk](http://www.geus.dk; www.vfl.dk)

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This country profile was compiled by the OECD Secretariat and reflects information obtained in a 2014 OECD questionnaire on groundwater use in agriculture. Further information and analysis can be found in OECD (2015), *Drying Wells, Rising Stakes: Towards Sustainable Agricultural Groundwater Use*, OECD Studies on Water, OECD Publishing. The countries profiles for 16 countries of OECD are available for download at: [www.oecd.org/tad/sustainable-agriculture/groundwater-use.htm](http://www.oecd.org/tad/sustainable-agriculture/groundwater-use.htm)