



# Policies to Manage Agricultural Groundwater Use

## ISRAEL

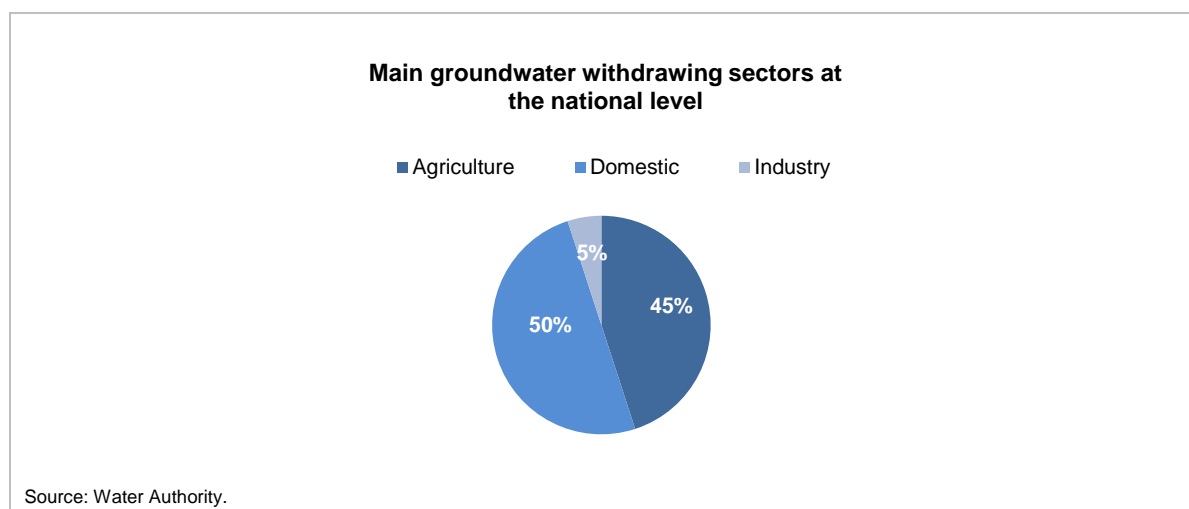
Agriculture represents about 45% of groundwater withdrawals in Israel. While the intensity of groundwater use in irrigation is moderate in Israel as compared to other OECD irrigating countries, the minimal natural aquifer recharge of aquifers makes Israel the most groundwater-stressed OECD country. A range of policy instruments are used to manage groundwater use in agriculture, from regulations on wells and use, to economic instruments (pricing and markets) and collective approaches. These approaches are complemented by recharge, storage and other supply-side schemes to cope with the limited rainfall. Still, the example of the Western Galilee region illustrates that groundwater pumping generates a number of significant and sometimes growing externalities.

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

Institution	Role
Water Authority	National water resource management.

### 2. Status and use of groundwater resources

- Total groundwater resource: 0.001km<sup>3</sup> in 2012.
- Annual groundwater recharge: 0.0012 km<sup>3</sup> in 2012.
- Annual groundwater use is estimated to 0.001km<sup>3</sup> in 2012.
- Groundwater irrigation area: 88 969 ha in 2010.
- Groundwater withdrawals for irrigation: 0.47km<sup>3</sup> in 2010.
- Groundwater use in agriculture is 0.47km<sup>3</sup> (2010 and 2013).



### 3. Inventory of national policies affecting agricultural groundwater use

#### Recent groundwater management reforms

Reforms	Year	Scope and objective	Degree of implementation
Regulation of water allocations to farmers	2012	Establish rules of quota allocation in government regulation.	Complete
Regulation of levies for water extraction from wells	2014	Change of the system to calculate levies, increase of levies (in planning stage).	Partial

#### Core groundwater management approaches at national level

Groundwater ownership	► Public
Groundwater entitlement characteristics	► Temporary, linked to land rights
Beneficiaries of entitlement	► Individuals, collective bodies (Kibbutz, Moshav) and companies
Groundwater entitlement allocation system	► Correlative rights (All groundwater use is limited by quotas, also for wells on private land.)

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

Regulatory approaches	Economic instruments	Collective management approaches
<p><b>Groundwater management plans</b></p> <p>► Mandated</p> <p><b>Coordination with surface water management</b></p> <p>► Systematic</p> <p><b>Regulations on wells</b></p> <p>► Approval of new well</p> <ul style="list-style-type: none"> <li>Accounting for well space restriction</li> <li>With environment impact assessment</li> </ul> <p>► Groundwater withdrawal restriction</p> <p><b>Mandated metering or monitoring system for groundwater</b></p> <p>► Mandated metering for agricultural users, monitoring for all wells, reported twice a year and the measures area enforced.</p>	<p><b>Economic instruments to regulate quantity: pricing</b></p> <p>Charges for pumped water from private wells today are low and do not account for environmental externalities or the scarcity value of water (quantity is restricted directly), pricing for fresh water (including groundwater) supplied by the National Water Company (Mekorot) is based on costs.</p> <p><b>Groundwater markets</b></p> <p>Water use rights are not transferable, there is a limited possibility to transfer water temporary (till 30% of the water quota, there are additional conditions).</p>	<p><b>Collective management schemes</b></p> <p>► Voluntary (self-regulation)</p> <p>Allocated water is collectively managed by cooperatives, according to guidelines.</p>

#### Other policies and programs affecting agricultural groundwater use

##### Agriculture water conservation programs

- Penalty

##### Land policies with implications on groundwater use

- Zoning with restriction on groundwater use
- Regional allocation system with groundwater priority for other uses
- Urban rural cooperation, e.g., contracts

### Climate change adaptation programs

- ▶ Investment in agriculture R&D
- ▶ Groundwater modelling and data development

### Watershed conservation programs

- ▶ Exclusion zone for conservation area

## Supply side management approaches

### Aquifer recharge programs

- ▶ Aquifer storage and recovery programs
- ▶ Groundwater banking
- ▶ Infiltration ponds

### Programs supporting the development alternative water supplies

- ▶ Surface water reservoir expansion
- ▶ Desalinisation
- ▶ Recycled water

## 4. Agricultural groundwater use at the regional level

### Western Galilee

Agro-climatic zone	Climate change prospective (2030-2050)	Is groundwater expected to be significantly affected by climate change in 2030-2050?	Surface Irrigation
Semi -arid	Drier, hotter, more frequent droughts and more frequent floods	yes	Surface water is available and used for irrigation. Surface water is used conjunctively. Surface water is used mostly in the northern parts of the country.

### Characteristics of the main aquifers in the regional unit

Karstic aquifers

Type of aquifer	Geological type	Maximum Thickness	Groundwater reserve	Groundwater recharge rate	Groundwater quality concerns
Confined	Karst	hundreds	>0.15 km <sup>3</sup>	0.15 km <sup>3</sup>	Growing. The main concerns are salinity and nitrate concentrations.

### Groundwater supported agricultural activities in recent years

Permanent or tree crop, livestock and other.

	Total number	Increase in the past 10 years	Average	Range	Variance
Estimated number of agricultural wells	1000 (2012)	Steady			
Evolution of the depth of the water table (trend in the past 10 years)			Lowering	Lowering	Lowering

#### Period of intense groundwater development

► 1960s, 1970s, 1980s and 1990s

#### Other uses of groundwater

	Minor	Major	Diminishing	Steady	Increasing
Domestic		✓			✓
Industry	✓			✓	
Mining	✓				
Energy	✓				

#### Pumping related external effects

	Minor	Major	Growing	Steady	Reducing
Pumping lift/cost increase		✓		✓	
Well yield reduction		✓	✓		
Stream depletion		✓	✓		
Vegetative stress		✓	✓		
Ingress of polluted water	✓		✓		

## 5. Bibliography

### Institutional websites

- [www.water.gov.il](http://www.water.gov.il)

### Official reports

- Annual report on national water resources, issued by the hydrological service-2012A.
- Annual report on the activity of the Water Authority, submitted to the Israeli Parliament.
- The Water Authority website contains annual reports, special reports, maps, data and special information regarding all aspects of the Israeli water sector website [www.water.gov.il/Hebrew/Pages/Water-Authority-Info.aspx](http://www.water.gov.il/Hebrew/Pages/Water-Authority-Info.aspx)
- The natural water resources between the Mediterranean and the Jordan river 2012, website [www.water.gov.il/Hebrew/Pages/Water-Authority-Info.aspx](http://www.water.gov.il/Hebrew/Pages/Water-Authority-Info.aspx)

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)