



REDUCING GROUNDWATER OVEREXPLOITATION TO STRENGTHEN WATER RESILIENCE

Policy Brief

Name of Indicator: Percentage of groundwater bodies in poor condition due to overexploitation

Field of Application: Essential Services & Critical Infrastructure

This policy brief is part of the ClimEmpower policy recommendations, available from climempower.eu. It translates evidence and project findings into practical guidance for regional and local policymakers seeking to strengthen resilience to climate and other systemic disruptions. It focuses on groundwater status and the governance, monitoring and demand management needed to bring abstraction back into line with recharge capacity.

The main recommendation is to reduce groundwater overexploitation by aligning abstraction with recharge capacity through integrated governance, monitoring and demand management. This requires stronger regulatory frameworks, better data availability and greater use of alternative water sources, enhancing water resilience while maintaining ecosystem integrity.

Groundwater Resilience & Water Security



Key Challenges

- Drought frequency is rising while aquifer recharge rates decline
- Abstraction exceeds recharge due to fragmented monitoring and weak governance
- Alternative water sources remain underutilised, deepening dependency on groundwater



Good Practices

- Real-time monitoring and remote sensing of abstraction and recharge rates
- Efficient irrigation and water-efficient farming practices
- Reclaimed wastewater, rainwater harvesting and nature-based solutions



Priority policy actions



Strengthen groundwater monitoring and data systems

Develop monitoring systems that track abstraction and recharge rates, using real-time data, digital tools and remote sensing for evidence-based decisions.



Improve governance and regulatory frameworks

Establish enforceable abstraction limits based on recharge capacity, with cross-sector coordination, stronger licensing and compliance mechanisms.



Promote water demand management and efficiency

Prioritise efficiency, particularly in agriculture, through irrigation technologies, crop selection aligned with water availability and economic incentives.



Develop and scale alternative water sources

Expand reclaimed wastewater, rainwater harvesting and, where appropriate, desalination, alongside nature-based solutions and urban water reuse.



Enhance stakeholder engagement and participatory governance

Involve farmers, industries and local communities in water management to improve compliance, reduce conflicts and support equitable allocation.

Implementation Roadmap

1

Phase 1 — Assessment and monitoring

Assess groundwater status, identify overexploited areas and establish monitoring capable of tracking abstraction and recharge rates.

2

Phase 2 — Governance and regulatory strengthening

Implement clear regulatory frameworks, define abstraction limits and strengthen enforcement and cross-sector coordination.

3

Phase 3 — Demand management and alternative supply

Reduce abstraction through efficiency measures and expand alternative sources, prioritising sustainable irrigation and water reuse.

4

Phase 4 — Monitoring, evaluation and adaptive management

Track groundwater conditions and policy effectiveness continuously, using data to inform adaptive governance as conditions evolve.

Funding

🌿 European Regional Development Fund (ERDF)

Can finance water infrastructure, monitoring systems and efficiency measures.

🌿 Common Agricultural Policy (CAP)

Can support sustainable irrigation practices and water-efficient farming.

🌿 LIFE Programme

Can support aquifer recharge and ecosystem restoration pilots.

🌿 Horizon Europe

Can fund research on water management technologies and governance models.

🌿 National and regional programmes

Can further support water reuse, monitoring and adaptation measures.



Conclusion

Reducing groundwater overexploitation improves water security for communities and reduces competition between users during periods of scarcity.

It also protects aquifer ecosystems and prevents degradation linked to depletion and salinisation, while reducing the long-term costs of water shortages and emergency supply measures.