Safeguarding Malta’s Groundwater

EUROSAI Water Seminar - Oslo
23rd April 2013

National Audit Office
MALTA
Discussion outline

- Background
- Current status of Malta’s Groundwater
- Environmental and audit risks
- Audit objectives
- Audit conclusions
- Outcome of the Audit
- Lessons learned
Background

- In Malta water is as precious as it is scarce, because of geographic and climatic conditions
  - Maltese Archipelago - one of the smallest in the Mediterranean - 316 km²
  - Annual rainfall of about 553 millimetres (21.7 inches) falls between October and March
  - The Maltese Islands have no surface waters on which to rely

Malta has the highest Water Competitive Index in the world

- Malta 24,800 inh/hm³yr
- Israel 5,612
- Cyprus 929
- Italy 341
- France 169
- Greece 155
Current status of Malta’s groundwater (I)

- There is a heavy dependence on groundwater that is nowadays subject to intense pressures by different sectors of the community
  - Agriculture - demand doubled over the last 50 years
  - Domestic - an increase in consumption due to higher standards of living
  - Commercial and industrial - Industrial and commercial establishments account for 8% of the total demand
  - Tourism – estimated to consume around 5 per cent of overall demand
Current status of Malta’s groundwater (II)
Current status of Malta’s groundwater (III)

- Potable water supply comes from two sources: groundwater and desalinated water
- Today, groundwater accounts for nearly half of the potable water consumed
- Seawater desalination inevitably provides for the shortfall in drinking water demand, at a high financial and economic cost
- There are high financial and significant externalities related to desalination carried out through reverse osmosis plants
Current status of Malta’s groundwater (IV)

- Over abstraction and high contamination renders Malta’s groundwater as ‘at risk’
  - widespread unauthorised abstraction
  - decrease in precipitation which will limit recharging of aquifer systems
  - Some 50 percent of water recharged into the aquifer systems is lost naturally through subsurface discharge to the sea
  - Increased salinity due to sea water intrusion
  - Nitrate contamination of most of aquifer system due to intensive livestock production, fertiliser use and leakages in the sewage collection system
- FAO estimates that the total substitution of groundwater with desalinated water will double the retail cost of water for consumers
Current status of Malta’s groundwater (V)

Groundwater Quantitative Status

Key:
- Green: Good Status
- Red: Poor Status

INDICATIVE ONLY - Not to be used for direct interpretation

Groundwater Qualitative Status

Key:
- Green: Good Status
- Red: Poor Status

INDICATIVE ONLY - Not to be used for direct interpretation
Environmental and audit risks (I)

• Continued insufficient regulation of abstraction of groundwater carries the severe risk for the aquifers’ capacity to store freshwater

  • Slow aquifer recharge – in some cases it may take around 30 years

  • Slow progress has been registered in identifying, metering and monitoring the use of boreholes abstracting groundwater

  • The lack of realistic information to the cost of groundwater hinders policy development relating to price mechanisms

• There is no fee assigned to groundwater abstraction

• There are no legal instruments in place to ban use of groundwater for landscaping
Environmental and audit risks (II)

- Climate change also poses threats to groundwater
  - Rise in annual average temperature
  - Change in annual mean precipitation
  - A higher incidence of drought periods
  - Increase in sea level rise
# Environmental and audit risks (III)

<table>
<thead>
<tr>
<th>Regulatory framework</th>
<th>Responsible entities</th>
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</thead>
<tbody>
<tr>
<td><strong>International obligations</strong></td>
<td>MEPA</td>
<td>MRRA</td>
<td>Other Departments</td>
<td>CCCA</td>
<td>NAU</td>
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<td>National legislative framework</td>
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<td>Water Policy Framework Regulations, 2004</td>
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<td>Water Policy</td>
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<td>WCMP</td>
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<td>Nitrates Directive</td>
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<td>Protection of waters against pollution caused by nitrates from agriculture sources, 2003</td>
<td>NAP</td>
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<td>Second Communication to the UNFCCC</td>
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<td>NCCAS</td>
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<td><strong>Oversees implementation</strong></td>
<td>OPM</td>
<td>MRRA</td>
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Audit objectives

- The main aim of this audit was to determine the extent to which Malta is being effective in safeguarding groundwater against current and climate change threats.

- This included ascertaining the degree to which Government:
  - identified prevailing and climate change threats and their impacts
  - developed the relevant framework to address the current status of groundwater
  - implemented measures to safeguard groundwater in an effective and expedient manner
Groundwater risk and vulnerability assessments (I)

1. Review Theoretical Information

2. Review current situation:
   - Identify the threats

3. Ranking of risk identified:
   - Low
   - Medium
   - High

4. Impact of risks:
   - Current
   - Future

5. Action Plan:
   - Develop New adaptation measures
   - Reviewing existing control measures

Legislative Framework

Continuous Monitoring
## Groundwater risk and vulnerability assessments (II)

<table>
<thead>
<tr>
<th>Description</th>
<th>Publishing date</th>
<th>Entities performing the assessments</th>
<th>Cost (€)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Malta Water Resources Review</td>
<td>2006</td>
<td>MRA with the collaboration of the FAO</td>
<td>This report was funded by the FAO.</td>
</tr>
<tr>
<td>A Preliminary Study on the Identification of the Sources of Nitrate Contamination in Groundwater in Malta</td>
<td>2008</td>
<td>British Geological Survey</td>
<td>242,600</td>
</tr>
<tr>
<td>The Environment Report – Fresh Waters</td>
<td>2008</td>
<td>MEPA</td>
<td>60,252(^{22}) are the total costs of the Environment Report. However, this figure excludes the costs of the work performed by MEPA staff.</td>
</tr>
<tr>
<td>The Second Communication to the UNFCCC</td>
<td>2010</td>
<td>MEPA, MRRA, UoM, UNDP</td>
<td>269,668</td>
</tr>
<tr>
<td>The Water Catchment Management Plan for the Maltese Islands</td>
<td>2011</td>
<td>MEPA, MRA</td>
<td>Costs are absorbed by the responsible entities.</td>
</tr>
</tbody>
</table>
Various risk and vulnerability assessments were commissioned to identify threats to groundwater.

The process undertaken to conduct these assessments adhered to generally accepted practices.

Various constraints impeded the CCCA from conducting risk and vulnerability assessments on climate change projections.

Major limitations of these assessments related to data gaps, and reliability of data as well as Malta’s territorial size.

The approach adopted in the conduct of these assessments led to comprehensive evaluations.
Malta’s strategic vision to safeguard groundwater (I)

The audit criteria utilised to evaluate the appropriateness of the process adopted to develop the groundwater policy and regulatory framework included:

- Adherence to Government’s vision
- Addressing the prevailing groundwater concerns and climate change threats
- Establishment of targets indicating the expected outcomes, timeframes, responsibilities and cost estimates
Malta’s strategic vision to safeguard groundwater (II)

- The concerns identified through the risk and vulnerability studies served as major inputs in the development of Malta’s strategic vision and policies to safeguard groundwater.

- The strategic vision was mainly reflected in the Water Policy, Water Catchment Management Plan (WCMP), Nitrates Action Programme (NAP) and Nation Climate Change Adapation Strategy (NCCAS).

- In some instances, the objectives and measures in the above policy documents overlapped.

- In the draft Water Policy and NCCAS, the responsible implementing entities were not always defined.

- The four documents under review provide the appropriate guidance to the implementing entities to implement the measures.

- The WCMP measures were subject to a climate change check.
Malta’s strategic vision to safeguard groundwater (III)

- The formal approvals of the Water Policy and the National Climate Change Adaptation Strategy were delayed.
- The process to finalise Malta’s Water Policy had been ongoing since 2004.
- Although the Water Policy was officially approved in mid-2012, various aspects were implemented before that date.
- However, the process to initiate the full implementation of groundwater measures was delayed until the formal approval of the NCCAS (which was approved shortly after the conclusion of our audit).
Implementing groundwater measures (I)

- Generally, there was sufficient coordination between implementing entities at the macro and micro level
  - Coordination at the macro level is carried out by the Ministry for Resources and Rural Affairs (MRRA)
  - The Inter-Ministerial Committee coordinates all activities relating to the implementation of the WCMP
  - Implementing entities utilise and share various groundwater expertise
  - There are various mechanisms to monitor the implementation progress of groundwater measures
Implementing groundwater measures (II)

- Entities could not fully operationalise adaptation climate change recommendations as the NCCAS was still in draft form.
- Entities implementing the WCMP measures are expected to achieve full implementation by 2015.
- NAP implementation is limited to those measures listed in the 2004 Action Programme.
  - More stringent measures included in the updated 2010 programme have not yet been implemented.
  - Farming community are not yet fully informed of their NAP obligations.
  - NAP enforcement action is limited to areas where EU obligations exist.
Implementing groundwater measures (III)

• The installation of bore-hole meters for agricultural purposes is already delayed by about two years. The MRRA contended that delays were mainly due to:

  • the various methods used over the years for the drilling of boreholes
  • the unavailability of the appropriate staffing levels at the MRRA to install meters - the recruitment process was still in progress
  • legal complexities, namely relating to the identification of ownership and multi users of water sources
Audit conclusions

The ‘at risk’ ground water status is mainly attributed to:

- Policy and regulation gaps
- Limited enforcement
- Data and management information gaps
- Absence of fiscal measures to control abstraction
- Administrative capacity issues
- Implementation of key measures still outstanding
- Significant progress has nonetheless been registered on the regulatory framework
Audit outcome

- Water policy and Climate Change Adaptation policies approved
- Increased public awareness
- Generated NGO interest
- Implementation of key measures
Lessons learned

- Scope of the audit was too broad
- Complex regulatory framework
- Limited management information
- Limited expertise
- Report may have been too technical to encourage more media coverage
- Issues related to Climate Change Adaptation Measures formed part of a joint audit with other WGEA members
Thank you

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