

Water Consumption and its Impact on Groundwater Resources

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Objectives

- Assess groundwater demand by sector and identify current and future uses for groundwater focusing primarily on:
 - Potable demand
 - Irrigation demand
 - Industrial demand
- Assess the implications of different water policy scenarios of water balance and implications for groundwater



A few pointers

- Distinguish between water use and water consumption
- Malta has a water problem – natural resources are insufficient to meet demand
- Data availability and the management of information are key to ensuring proper research, analysis and monitoring



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Potable Demand

- Potable demand essentially used for drinking, cooking, personal hygiene, toilet flushing, washing and other uses.
- Projected annual demand from current 29 million m³ expected to be around 25.5 million m³ by 2010.
- This implies an annual demand for groundwater of around 12 million m³.



Potable Demand

- Using a population based approach and taking account of tourism 3 scenarios for per capita consumption assumed (70lhd, 100lhd and 150lhd).
- Demand for groundwater would amount to a maximum of 5.2, 7.5 and 11.2 million m³ per annum.
- This is based on known info.
- Will quality restrict the use of groundwater for drinking purposes?



Quality Constraints

- Chloride and Nitrate levels for the Bingemma, Gozo MSL, Main and Mizieb MSL considered for quality purposes.
- MSL (3.6x) and Gozo (1.8x) aquifers manifest high chloride levels – used for abstraction of drinking water
- High nitrates in Bingemma perched and and MSL aquifers – possibly due to intense agricultural activity, leakages from sewerage system and animal husbandry



Demand from Agriculture

- Hard to quantify precisely
- Agricultural land classified into irrigated, dry and waste
- Statistics quote 8490 registered boreholes – but is this realistic?
- Extreme and intermediate scenarios considered:
 - All dry and irrigated land satisfied from GW
 - Only irrigated land satisfied from GW
 - Intermediate scenario



Demand from Agriculture

- Extreme scenarios yield a demand for 64 and 6.6 million m³ per annum from groundwater.
- Work by Mitschoff and Mangion give a realistic value of 13.7 million m³ per annum
- Is this sustainable?
- How will treated effluent impact these figures?
- Quo Vadis?



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Demand from Industry

- Demand for water is around 1.74 million m³ per annum.
- There are a number of heavy water consumers.
- Can water be used in a more rational manner?



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Behavioural Patterns

- High proportion of domestic consumption is metered – actual demand can be established
- Within the tourism sector there is a portion of water that is not drawn from public network.
 - What is its source?
 - Does it have an impact on GW
- Agricultural demand draws extensively on groundwater resources and partly on treated effluent.



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Behavioural Patterns

- Whilst domestic, tourism and part of industrial consumption contribute a return to the sewerage system, water used in agriculture does not.
- Rainfall in Malta is very seasonal – can we afford to store it?
- Treated effluent – how can we maximise its use to protect GW resources



Policy Considerations

- In formulating a water policy for the Maltese Islands a number of considerations need to be made.
- Stakeholder input is very valuable but the common good must prevail and therefore the way forward must be objective.
- Ultimately the importance and value of water must be appreciated and the degree of protection afforded to this important resource.



Policy Considerations

- Demand Side Management
- Regulation of boreholes
- Maximising use of treated effluent
- Revision of tariffs and principle of cost recovery
- Harnessing stormwater runoff
- Improving the agricultural dimension
- Benchmarking
- “Unaccounted for water” control



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Policy Considerations

- Data availability
- Stakeholder involvement
- Raising awareness
- Capacity building
- Water allocation policy
- Introducing appropriate fiscal initiatives



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