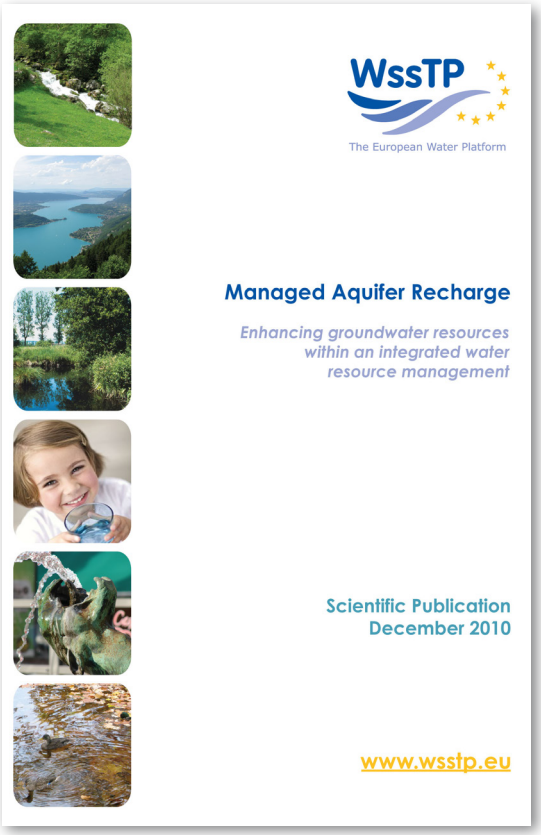
Executive Summary
Managed Aquifer Recharge Report

WssTP
The European Water Platform

THE BACKGROUND OF THE MANAGED AQUIFER RECHARGE REPORT



Against the background of growing urbanization and industrialization world wide as well as predicted climatic changes the sustainable use and conservation of groundwater representing 98 % of the world's icefree freshwater resources is of greatest importance. Over-abstraction of groundwater for drinking water and irrigation has already now lead to a widespread decline in water levels resulting in increased energy consumption for pumping, saltwater intrusions and land subsidence especially in regions vulnerable to water scarcity and drought. Managed Aquifer Recharge (MAR) can serve as a tool to support natural groundwater replenishment for drinking water, irrigation or industrial use and to achieve the goals of the EU water framework directive by an optimized regulation of the water cycle on basin scale. Though MAR has been implemented at many sites world wide it is not as common as regarded necessary to meet future challenges.
Managed Aquifer Recharge (MAR) comprises a wide variety of systems in which water is intentionally introduced into an aquifer. The objective is i) to store excess water for times of less water availability (especially in arid and semiarid regions), ii) to introduce an (additional) barrier for purification of water for a specific use iii) or to reduce the risk of intrusion of impaired water (e.g. in coastal aquifers).

MAIN PURPOSE OF THIS REPORT

Although MAR is already applied in several locations in Europe and abroad for different purposes, it has not yet developed its full potential as a method to adapt water resources management to emerging and future challenges. MAR can play a key role in adaptation to climate change and water stress mitigation. It should thus become an integral part of IWRM as requested by the WFD. Future activities of the WssTP task force and subsequent European research should therefore focus on strategies to bring MAR in the mainstream of IWRM planning. It is proposed to initiate a research project that aims at facilitating the implementation of MAR integrating the needs of different end-users (i.e. water suppliers, public interest groups, farmers, industry) with the approach of an Integrated Water Resource Management (IWRM). This shall be achieved by strengthening the role of MAR as regulatory management tool for basin and groundwater system scale IWRM and by reducing the uncertainties regarding the systems' performance.

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A Common Vision for Water Research and Innovation

RESEARCH GAPS FOUND

In the course of climate change and the search for alternative water resources MAR provides a promising perspective especially with regard to public perception of water re-use and storm water harvesting. There are, however, several issues that need to be regarded in order to provide a sustainable and safe solution for future needs.

- Administrative implementation of MAR needs to be further supported as the regulations – where they exist – are inconsistent
- In order to assess the viability of MAR systems the benefits with regard to quantity and quality need to be predicted as precisely as possible and compared to potential environmental drawbacks and economical risks
- Quantity and quality issues need to be addressed: The prediction of the storage potential of an MAR system is crucial for the design and planning of such systems
- The combination of subsurface passage with advanced water treatment methods like ozonation have so far not been thoroughly investigated with respect to biochemical reactions in the subsurface (especially concerning removal of oxidation products) and possible environmental and health impacts (toxicity assessment)

CONCLUSIONS

In general MAR - to add further to the developments so far achieved in previous projects and to place itself in future scenarios - must be seen in a wider context - as a management tool to ensure water supplies under changing climatic and geographical regimes AND as a means to achieve the goals of the EU directives - by interfering with and controlling the water cycle on basin scale.

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