

## MAR to MAR-k€t **STRATEGIES AND ACTIONS TO BRING MANAGED AQUIFER RECHARGE SCIENTIFIC BASED SOLUTIONS AND TECHNIQUES TO THE INDUSTRY**





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## INTRODUCTION

The major questions to be addressed by the Action Group are based on the idea that "Industry should understand that much of its future is linked to groundwater by means of increasing its awareness through adapted dissemination techniques". There are still some barriers that difficult the MAR market uptake but that can be overcome with appropriate promotion of research outputs and a two-way interaction process with stakeholders (WaterDISS, 2013, http://www.waterdiss.eu/node/71).

#### Some challenging lines of action are:

- Water efficiency linked to a bigger productivity and savings in water supply and energy costs (the demand for water is currently increasing).
- Better cope with climate change extreme events (floods and droughts).
- Guarantee for sustainability and permanence even in water scarcity situations.
- MAR technique as a "Market opportunity" for market drivers and applications.
- Lower "Blue print" or "water foot-print" and smaller impacts in the aquifers whose content is going to impact other places as virtual water.
- Huge potential to convert MAR into job opportunity creation.
- Strengthen cooperation with international organisms, in particular the IAH-MAR Commission, UNESCO, World Bank, FAO and Red Cross.



- Sequential actions involving, firstly, related industrial sectors of high visibility.
- Mathematical modelling and hydrogeological scientific based indexes for the appropriate location of new MAR sites.
- Hydro-economic modelling (combining hydro (geo) logical, structural, institutional and economic factors to simulate the evolution of the value of water in space and time).

## FRAMEWORK

#### **MAR-SOLutions project Demo sites**



## INDUSTRY MUST BE AWARE THAT MUCH OF THEIR FUTURE IS LINKED TO GROUNDWATER: -Water efficiency linked to a bigger productivity and savin -Permanence and sustainability guarantee -Lower "Blue print"



-Market analysis on the potential exploitation of the achieved Technological solutions



Demo sites to show the suitability of MAR technique

- Sequential actions involving, firstly, related industrial sectors of high visibility
- Technological solutions (wp13)
- Hydro-economic modelling (combines factors hydro (geo) logical, structural, institutional and economic to simulate the evolution of the value of water in space and time)
- 21 partners, 8 countries, 3 years, budget about 11 M€



# **RELATED INDUSTRIES**

- **1. AGRO-INDUSTRY**
- 2. WATER SUPPLY INDUSTRY
- **3. WASTE WATER TREATMENT PLANTS**
- 4. DESALINATIONS AGENTS
- **5. BOTTLED COMPANIES**
- 6. GOLF COURSES
- 7. PUBLIC ADMINISTRATION BRANCHES
- 8. BALNEARIES & SPAS (SALLUS PER AQUAM) 9. HOTELS AND TOURIST FACILITIES (MARKET **UPTAKE**)

dina - MAR

www.dina-mar.es

www.marsol.eu

MANAGED

AQUIFER

RECHARGE

SOLUTIONS

- 1- Water and energy efficiency. General improvements by means of MAR. 2-Increase the supply security.
- 3- Technological solution of first order(Reengineering).
- 4- technological advances (increased energy efficiency). Currently difficult but not unacceptable alternative.

5- early MAR). High level of dependence on supply security. Descend the high Blue and grey water footprints

- 6- Technological improvements (reengineering) and R&D results exploitation
- 7- Promotion of "Water markets" (Cap & trade management). Increase the supply security.

## Promotion of alternative resources in IWRM.

8- Avoid or minimize risk before any qualitative variations.

9- Awareness and Demo for this sector to realize some of their spills can be injected into the aquifer

avoiding saline intrusion in coastal areas and a future secure availability.









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## CONCLUSIONS

- Eight field sites selected for MARSOL project will ensure the development of this action group with a huge component of "innovation in action".
- The proposed demo sites will demonstrate the applicability of MAR using various water sources, ranging from treated waste water to desalinated seawater, and a huge variety of technical solutions.
- Targets are, at least, the alleviation of the effect of climate change on water resources, the mitigation of droughts, to countermeasure temporal and spatial misfit of water availability, to sustain agricultural water supply and rural socio-economic development, to combat agricultural related pollutants, to sustain future urban and industrial water supply, to limit seawater intrusion in coastal aquifers and to guarantee the survival of certain ecosystems.
- Results of the field sites will be used to develop guidelines for MAR site selection, technical realization, monitoring strategies, and modelling approaches to offer stakeholders a comprehensive, state-of-the-art and proven toolbox for MAR implementation.