

## **IAH Commission on Management of Aquifer Recharge**

### **Annual Report 2004**

**Peter Dillon and Ian Gale**

#### **Goals of IAH-MAR:**

The proposal to form this Commission, approved by IAH Executive, January 2002, states its goals. "IAH-MAR aims to expand water resources and improve water quality in ways that are appropriate, environmentally sustainable, technically viable, economical, and socially desirable. It will do this by encouraging development and adoption of improved practices for management of aquifer recharge. This will be achieved by increasing awareness of MAR among IAH members, related professions and the community, by facilitating international exchange of information between members (e.g. via a web page and an email list), by disseminating results of research and practical experience (e.g. via conferences and reference database), and by undertaking joint projects and activities identified as important by its members."

Progress against a list of more specific plans is presented later.

#### **Major Activities in 2004:**

This year there has been much activity and some progress towards the Commissions Goals. It is becoming clear that without financial resources of its own, and with organizations that employ members reducing discretionary time and requiring increased out-of-hours time, the opportunity for volunteer work on the Commission's projects is diminishing. Our response has been for members to consider the Commission's objectives when bidding for research projects and consultancies, and arranging with clients for the results to be publicly available and disseminated via IAH-MAR web site and/or publications. With a strategic approach, such work can then be paid for and is then undertaken within the scope and priorities of employing organizations and is adequately resourced.

Four examples are:

- In 2002 Ian Gale, British Geological Survey, UK won a DFID project on MAR in the Indian subcontinent, supporting strategic directions for MAR and maintaining the IAH-MAR web site, which is used to disseminate DFID project outcomes via the BGS web site.
- In late 2004 Albert Tuinhof, Acacia Institute, Netherlands, has obtained Netherlands Government Funding to assist him in leading his working group to complete and disseminate an international inventory of MAR.
- Ricky Murray, formerly CSIR, South Africa, supported by Water Research Commission of South Africa completed an excellent plain-english summary of application of MAR in southern Africa, which will also be of benefit in promoting appropriate use of MAR elsewhere..
- Peter Dillon, CSIRO, has a project supported by Victorian Smart Water Fund covering development of a Code of Practice for Aquifer Storage and Recovery, and allowing the generic draft to be circulated widely, including on the IAH-MAR web site in mid 2005.

Members of IAH are encouraged to identify their current and intended activities and projects that may contribute to achievement of IAH-MAR objectives and to disseminate outcomes via the IAH-MAR website or inform other members via the email list. Keeping in mind the Commission's goals when planning new work can add international value to projects that may otherwise have only localized benefits. Maintenance of the IAH-MAR web site and searchable publications data base is a small cost that needs to be met if these services are to continue, so where possible members are requested to make provision within the budgets of proposed projects. Each sponsor will be acknowledged on the home page. The Commission is particularly indebted to DFID and BGS for maintaining the web site and CGS for hosting the email list over its first three years.

UNESCO and IAEA have provided strong support to regional workshops in MAR. In 2004 UNESCO workshops were held in Yazd, Iran 27 Nov-1 Dec and in HoChiMinh City, Vietnam 15-17 Dec 2004. Each

had more than 20 delegates representing at least six countries within the region. UNESCO/IAEA also had the notes of its Egypt workshop, Dec 2003, which we understand is to be loaded onto the IHP website. In Sept 04 the Global Environmental Facility (associated with World Bank) has specifically referenced MAR as warranting further effort and the Yadz workshop has identified opportunities for investment and research which will be of regional benefit for water security and relates MAR with catchment management strategies such as erosion prevention. Demonstration projects are needed, with research, monitoring and evaluation to provide a basis for regional training, and allow development of community involvement, maintenance procedures, continuous improvement and adaptation to meet local needs including governance requirements.

WHO released a 200+page State of the Art Report on Health Risks in Aquifer Recharge Using Reclaimed Water, edited by R. Aartgeerts and A. Angelakis. IAH Commission had input to this through Ian Gale participating in a preparatory workshop. IAHS are in the process of publishing a 'Red Book' on the Symposium on Methodologies for Risk Assessment of Wastewater Re-use for Groundwater Quality, at Sapporo, Japan 7-8 July 2003, organized by Joop Steenvoorden. IAH-MAR input to both of these activities was facilitated by a UNESCO-IAH planning meeting held jointly with a number of sister organizations in April 2002.

The 3<sup>rd</sup> Plenary of IAH-MAR was held on 13 October 2004 in Zacatecas, Mexico during the IAH XXXIII Congress. Due to due to unfortunate timing and publicity there were only 4 attendees: Willy Struckmeier, Emilio Custodio, Uwe Troeger and Peter Dillon, and the Plenary was held jointly with the Commission on Hydrogeological Maps, convened by Willy Struckmeier. Two actions arose from the meeting, (1) to seek to make the IAH-MAR web site, particularly publications data base, more accessible to Spanish speaking hydrogeologists, and (2) to aim to include a workshop at ISMAR5 (Berlin June 2005) that more directly addresses the needs of developing country delegates. Minutes of the meeting and more detailed reporting of items are presented on the IAH-MAR web page: [www.iah.org/recharge](http://www.iah.org/recharge)

Preparations are advanced for the 5th International Symposium on Management of Aquifer Recharge, 12-16 June 2005, Berlin. 170 abstracts were received from 30 countries. For latest information see: [www.ismar2005.org/](http://www.ismar2005.org/) ISMAR6 is planned for Nov 2007 in Phoenix, Arizona. Both are run in association with other bodies including ASCE.

## **Comparison of Progress with Proposed Milestones for Commission on MAR:**

### **1. That by 2004 all new recharge enhancement projects in developing and developed countries are appropriate and sustainable. Specifically**

- (1) that recharge enhancement is part of an integrated plan including demand reduction where aquifers are over-exploited, and
- (2) that planning, design, construction, operation and maintenance of recharge enhancement projects take into account sustainability of the project technically, environmentally, socially, and in a regulatory context and from a catchment/basin perspective.

#### *Assessment criteria:*

- (a) relevant literature eg proposed UNESCO Wise Strategies for Recharge Enhancement completed and available on a web page by Sept 2002, disseminated at ISAR4, and available as text through UNESCO regional offices and IAH National Chapters. (*ACHIEVED*)
- (b) These topics are included within short courses run by IAH-MAR (*ACHIEVED IN UNESCO WORKSHOPS*)
- (c) Feedback from item 4. (*INCOMPLETE*)

### **2. That there is continuous improvement in the design and operation of all types of managed recharge projects throughout the life of the commission.**

#### *Assessment criteria:*

- (a) IAH-MAR encourages an increase in research and development, including assessment of performance of existing MAR projects, and improved understanding of fundamental physical and biogeochemical and ecosystem processes - number of postgraduate students working on MAR research, number of research

projects, demonstrated integration of research projects (*INFORMATION NOT COLLECTED*)

(b) In conjunction with other groups such as ASCE/EWRI, universities, research institutions and practitioners, disseminate information on improvements in design, operation and maintenance of MAR projects - number of items related to this on web page and its links, or on email list (*PUBLICATIONS DATABASE ESTABLISHED, 500 ABSTRACTS*)

(c) Feedback from item 4.

**3. That security of water supply volumes and quality are increased as a result of effective management of aquifer recharge**

*Assessment criteria:*

(a) Feedback from item 4, and from UNESCO World Water Reports (*INCOMPLETE*)

**4. That knowledge of the world status of the installed capacity and effective utilisation of managed aquifer recharge be determined, so as to assess its uptake and effectiveness.**

*Assessment criteria:*

(a) Establishment of a stock-taking mechanism, initially to be informal via membership to ultimately become formalised through adsorption by other organisations undertaking related tasks (*INCOMPLETE*)

**5. That IAH-Commission on MAR plays a central role in integrating international and national efforts in this field, and provides effective communications via web pages, email list, and links with other organizations with common goals.**

*Assessment criteria:*

(a) by mid 2002 production of a brochure, supported by UNESCO and jointly with major collaborators, to assist in international networking and future coordination (*ACHIEVED*)

(b) number of active members, number of countries represented, number of active collaborating organisations, number of members on email list, number of hits on web-page(s), proportion of tasks entraining members of other organisations, companies, associations, influence on and coherence of relevant goals of other organisations and of IAH (*IAH\_MAR SITE PREDOMINATES SEARCH ENGINE RESPONSES ON RECHARGE ENHANCEMENT, ARTIFICIAL RECHARGE. HOWEVER LEVEL OF PENETRATION IS STILL LOW*)

**6. That IAH MAR stimulates and promotes training and education programs, workshops and conferences in order to ensure effective communication to all with a need to know, and with particular consideration to those in developing countries. Notionally one international conference in 2002 and 2006, with regional conferences alone or integrated within national and international IAH meetings.**

*Assessment criteria:*

(a) successful ISAR4 conference in Adelaide 22-26 Sept 2002 (*ACHIEVED 200 DELEGATES, 100 PAPERS, 20 SPONSORED INTL DELEGATES, 27 COUNTRIES*)

(b) successful UNESCO/IAEA/IAH workshop on evaluation of recharge enhancement in arid and semi arid areas, Adelaide 21-22 Sept 2002 (*ACHIEVED, 50 DELEGATES, 20 COUNTRIES*)

(c) number of events organised and attendance, number of countries represented, proportion of positive feedback forms from attendees at organised training programs, number of postgraduate students working on MAR research (*UNESCO WORKSHOPS IN EGYPT, IRAN, VIETNAM, GROUNDWATER TRUST WORKSHOPS IN USA (2))- RESPONSES NOT RECEIVED*)

**7. That IAH-MAR has a capacity to respond to needs in this area, particularly for developing countries and where needs are severe.**

*Assessment criteria:*

(a) proportion of demands that are met (*EMAIL QUERIES MET, SMALL NUMBERS – AVE 1/MONTH*)

**Progress against planned activities - From IHP 6 Plan, April 2002**

<i>Item</i>	<i>activity</i>	<i>responsibility</i>	<i>target date</i>	<i>status</i>	<i>resources reqd US\$</i>
(1)	MAR program aims brochure	Gale	Sep 02	completed Sep 02	UNESCO
(2)	Wise strategies for MAR publication	Gale	Mar 03	in progress (est Jun 05)	10.000
(3b)	International inventory of MAR	Tuinhof	Mar 03	in progress (est ??? 05)	NL govt
(4)	Evaluation of MAR methodology report	Beernaerts	Jun 03	in progress (est ??? 05)	FAO
(5)	Evaluation effectiveness report	Gale	Jun 05	in progress	DFID
(6)	Health risks MAR w/- reclaimed water	Carr	Dec 03	completed 2004	WHO
(7)	Risk wastewater reuse & gw quality symp	Steenvoorden	Jul 03	completed	IAHS
(8)	ISAR4 & IHP-IAH Workshop	Dillon	Sep 02	completed	UNESCO
(9)	Rainwater harvesting for agric	FAO	03 – 07	in progress	FAO
(10)	Promoting isotope evaluation in MAR	IAEA	03 – 07	in progress	IAEA
(11)	Review inventory, policies, guidelines	Olsthoorn	03 – 07	in progress	SWF
(12)	Web-searchable publications data base	Gale	02 – 07	established & ongoing	5.000 pa
(13)	Research	IAH UNESCO	02 – 07	in progress	AWWARF_WRF_EC
(14)	Decision support tool for MAR?			to schedule	
(15)	Coastal zone gw management?			to schedule	
(16)	Low cost tech brackish water reclam ?			to schedule	
(17)*	Training (items 2, 5, 9, 10, 11)	IAH UNESCO	03 – 07	in progress	20.000 pa

**Total per year 2004-2007**

**est \$25,000 pa**

More details on these appear on the IAH-MAR web site (in Meetings page) under:

[http://www.iah.org/recharge/pdf/PROPOSED\\_ACTIVITIES-Apr02\\_Mtg\\_recs-12jun02.pdf](http://www.iah.org/recharge/pdf/PROPOSED_ACTIVITIES-Apr02_Mtg_recs-12jun02.pdf)

Peter Dillon  
Chairman, IAH-MAR  
1 Jan 2005

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