

The Project Place

Regional Drinking Water Quality Assessment in the Middle East: An Overview and Perspective

The increased pressure on scarce water resources, coupled with inadequate treatment of point and nonpoint sources of pollution, have caused a rapid degradation of chronically depleted water resources, contributing significantly to the ongoing conflicts in the region in general and to the Palestinian-Israeli conflict in particular. Further, transboundary movement of pollutants from one entity to another endangers the shared water bodies, which without adequate treatment pose a health risk to the population who are dependent on these resources for their drinking water.

Accordingly, the aim of the project is to conduct, under a multinational collaborative effort, an assessment of current and prospective deficiencies in water quality, providing an account of water quality conditions, treatment, risk assessment, and prospects for alleviation and mitigation of poor water quality, and environmental degradation.

The proposed geographical area for the planned study is shown in the map below.

Objectives

- study and evaluation of critical water resources and water quality issues of relevance to the defined working area, as a whole
- evaluation of water quality control strategies, regarding domestic water supplies and wastewater collection and treatment
- conservation of aquifers and ecosystems, as well as reuse of wastewater
- treating specific critical issues and relevant case studies
- recommendation of uniform and applicable water quality standards, enabling regional water management and valid comparison of water quality data across the region

Methodology

- data collection, review and data credibility
- water quality control
- environmental impact assessment
- management factors
- best engineering and other practical means for improvement
- regional interaction and cooperation
- dissemination

Work Plan and Organization Chart

The project was approved at the end of 2008, and initiated in 2009. The first meeting of the group was held in Amman, Jordan, the 15–17 November 2009.

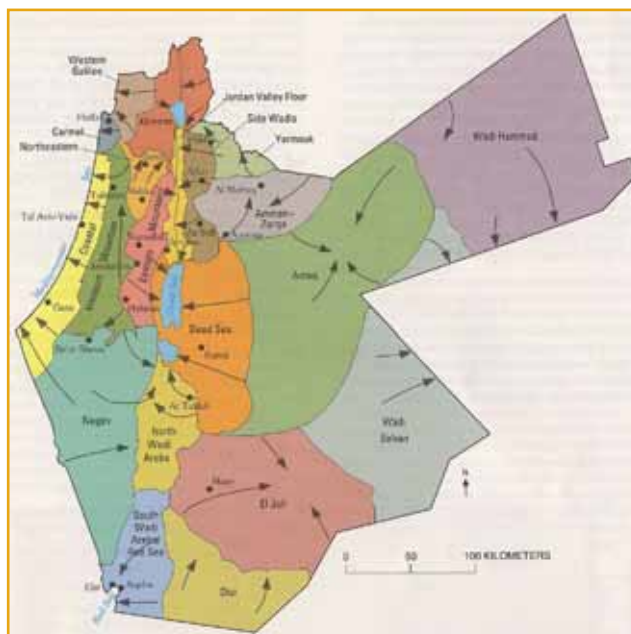
Anticipated Impact

- establishment of a regional alliance of scientists and engineers to work and advise on environmental issues of regional importance
- review of regional water quality issues and evaluation of specific case studies
- recommendations to policy makers and other stakeholders on water quality management strategy and technological development options
- contribution to coexistence in the region

The Working Group

The group comprises 17 scientists from the region supported by other U.S. and European members of the Chemistry and the Environment Division and CHEMRAWN. The group is divided into four sub-groups, each dealing with the compilation and evaluation of data of each entity before integration and assimilation of the data into a regional report. The working group composition is given on the project web page.

Twelve members of the working group and two invited guests—Liev Sydnes, IUPAC past president and currently chair of CHEMRAWN; and Nicola Senesi, president of the Chemistry and the Environment



Groundwater basins and directions of groundwater movement under study in this project.

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Division—were able to attend the meeting, which was part of the Malta IV Conference “Frontiers of Chemical Sciences: Research and Education in the Middle East.” The meeting aimed to overcome prejudices and antagonisms among people and enable cooperation among individuals despite their political differences.

Scientists from 14 different countries, including several Nobel Laureates, participated in the workshops, which were related to air and water quality, and were well attended, with more than 40 participants. A range of oral presentations and poster sessions provided participants with an overview of current efforts to characterize regional environmental issues, and develop management strategies. Regional air and water issues, and potential mitigation strategies and technologies, were presented, and drew interested workshop participants beyond the working group members. These included:

- Abdelrahman Tamimi: “The Regional Experience in Pollution Monitoring”
- Miriam Waldman and Yehuda Shevah: “Water Resources and Water Quality Management—The Israeli Perspective”
- Nadia Kandile: “The Impact of Human Activities on Wastewater Quality”
- Yehuda Shevah: “IUPAC Water Quality Working Group Project”
- Yousef Abu-Mayla: “Water Quality in Gaza-Palestine”
- Venice Gouda and Hassan Moawad: “Role of Chemistry in Solving Issues Related to Energy and Water Shortage”

The working group also presented a seminar by Heinz Hoetzel of the University of Karlsruhe, entitled “Improving the Availability of Water Resources for Arid and Semiarid Areas by Means of Integrated Water Resources Management,” which reviewed the hydrology, water usage and water quality issues facing the region.

In addition to the formal workshop activities, the task group held a series of planning meetings to refine:

- scope and objectives of the project
- collection of water quality data for Jordan, the Palestine Authority, and Israel
- work plan and time schedule
- additional funding required to implement tasks focused on data collection, data analyses, and development of policy options.



Participants at the Malta IV Conference in Amman, Jordan, 14–19 November 2009.

Conclusions

Environmental Impacts of Desalination Activities

The fast-increasing desalination activities in the region may threaten the environmental quality of coastal and marine ecosystems, as well as degrade marine water quality. The creation of a collaborative, multi-disciplinary research group is suggested to evaluate the impact of thermal discharges, brine disposal, and other desalination process emissions on coastal and marine water quality.

Atmospheric Deposition on Water Bodies

Meeting attendees proposed a study of the impact of air quality water quality in the eastern Mediterranean region. Such research would evaluate primary air pollution emissions from cities, industries, and agricultural activities, and ambient air-quality data across the region.

Project Expansion

- The initial “Phase 1” study area is to be expanded to the north to include Lebanon and Syria, which share many of the same water sources.
- Results of the initial study would be disseminated to motivate “Phase 2” studies that include Egypt, Libya, and Sudan to the west and Iraq, Kuwait, Saudi Arabia, and the Gulf states to the east.

The progress achieved by this collaborative activity during Malta IV should provide the momentum necessary for its continued success in addressing the acute crises of clean drinking water and ways to build bridges over transboundary waters.

Further information on the progress of the ongoing regional water quality assessment project, and issues associated with the project, may be obtained from Yehuda Shevah <ysheva@gmail.com>.

 www.iupac.org/web/ins/2008-003-3-600