

The Alicante Declaration:

Steps along the Pathway to a Sustainable Future

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That groundwater has contributed to the well being of many generations of people throughout the world cannot be denied. Nor can it be denied that the vast volume of groundwater still held in reserve throughout much of the world holds the promise to serve the well being of future generations. However, instances of groundwater depletion and contamination strongly suggest that improved groundwater management strategies are needed to ensure that the promise becomes a reality. Toward this end the attendees of the International Symposium on Groundwater Sustainability that was held in Alicante, Spain, on January 23-27, 2006 approved the Alicante Declaration (presented at the end of this note.) The Alicante Declaration contains seven "actions" that were identified as being essential for the responsible use, management and governance of groundwater. The actions range in focus from those that address hydrogeologic issues and concepts to those that address broader social concerns such as capacity building and public outreach. It is the manifold dimension of the Declaration—one whose actions address the reality that water problems can only be solved in the context of a place and its social, economic and cultural norms--that make it unique.

But will the Declaration be of any real use? It may be argued that forces already underway--the increasing demands for water, particularly in arid and semiarid regions where groundwater recharge is insufficient to replace that which is being pumped, climate change, and the growing awareness that groundwater levels must be maintained in order to support baseflow to streams and ecosystems--will inevitably reduce the volume of groundwater that is available for use. Under such a scenario groundwater is relegated to the role of an intermediate source of supply, one that allows the time that is needed to find alternate supplies. On the other hand, it can be argued that the application hydrogeologic science and data to real-world problems will contribute to ensuring the continued and essential role of groundwater as a source of supply. The enthusiasm with which the Alicante Declaration was embraced at the Alicante Conference and later at the Fourth World Water Forum in Mexico City held two months later (where this report was written) suggests that the later viewpoint predominates.

Implementing the actions of the Alicante Declaration requires several "next steps." First, although the Alicante International Symposium and the 4th World Water Forum session had a significant participation of experts in social sciences, the seven actions must be reviewed by those outside the hydrogeologic community in order to ensure that they accommodate broader water resources and societal concerns. It should be noted that the seven actions implicitly and explicitly acknowledge the importance of the integrated management of groundwater and surface water and, further, the need to integrate water resources planning with land use planning and energy development. However, it will be through continued dialogue in this regard that bridges of understanding can be built among those in traditionally separate technical fields,

places and cultures. It is expected that the seven actions will serve to focus the dialogue and move it from abstraction to reality. Once consensus is reached each of the seven actions should be expanded into an implementation plan that contains greater detail. Finally, prototypical applications or concrete case studies should be sought in order to test the efficacy of the overall approach and to refine it as necessary.

The Alicante Declaration and its seven actions is truly a "bottoms up" approach. To be successful all seven actions must proceed simultaneously so that impediments to success in any of the actions will be found and resolved as soon as possible. Papers presented at Alicante and Mexico City cite the "inefficiency" of using a linear approach to water-resources management. It is imperative to build social awareness, build technical capacity and remove governance roadblocks, for instance, even as the hydrogeologic studies proceed. This document may provide the basic guidelines to help us to move in this direction.

Individuals can endorse the Alicante Declaration by sending an e-mail to: mc.hernandez@igme.es. Under Subject write: "Alicante Declaration", and include in the message your name and country. Institutional endorsements are also encouraged. Institutions who wish to endorse the Alicante Declaration should contact Juan Antonio López Geta, Director of Hydrogeology and Groundwater of the Geological Survey of Spain at lopez.geta@igme.es for more information.

The Alicante Declaration

The Global Importance of Ground Water

A call for action for its responsible use, management and governance

Water is essential for life. Groundwater—that part of all water resources that lie underneath land surface—constitutes more than ninety five percent of the global, unfrozen freshwater reserves. Given its vast reserves and broad geographical distribution, its general good quality, and its resilience to seasonal fluctuations and contamination, groundwater holds the promise to ensure current and future world communities an affordable and safe water supply. Groundwater is predominantly a renewable resource which, when managed properly, ensures a long-term supply that can help meet the increasing demands and mitigate the impacts of anticipated climate change. Generally, groundwater development requires a smaller capital investment than surface water development and can be implemented in a shorter timeframe. Groundwater has provided great benefits for many societies in recent decades through its direct use as a drinking water source, for irrigated agriculture and industrial development and, indirectly, through ecosystem and streamflow maintenance. The development of groundwater often provides an affordable and rapid way to alleviate poverty and ensure food security. Further, by understanding the complementary nature of ground and surface waters, thoroughly integrated water-resources management strategies can serve to foster their efficient use and enhance the longevity of supply.

Instances of poorly managed groundwater development and the inadvertent impact of inadequate land-use practices have produced adverse effects such as water-quality degradation, impairment of aquatic ecosystems, lowered groundwater levels and, consequently, land subsidence and the drying of

wetlands. As it is less costly and more effective to protect groundwater resources from degradation than to restore them, improved water management will diminish such problems and save money.

Call for Action

To make groundwater's promise a reality requires the responsible use, management and governance of groundwater. In particular, actions need to be taken by water users, who sustain their well-being through groundwater abstraction; decision makers, both elected and nonelected; civil society groups and associations; and scientists who must advocate for the use of sound science in support of better management. To this end, the undersigners recommend the following actions:

1. Develop more comprehensive water-management, land-use and energy-development strategies that fully recognize groundwater's important role in the hydrologic cycle. This requires better characterization of groundwater basins, their interconnection with surface water and ecosystems, and a better understanding of the response of the entire hydrologic system to natural and human-induced stresses. More attention should be given to non-renewable and saline groundwater resources when such waters are the only resource available for use.
2. Develop comprehensive understanding of groundwater rights, regulations, policy and uses. Such information, including social forces and incentives that drive present-day water management practices, will help in the formulation of policies and incentives to stimulate socially- and environmentally-sound groundwater management practices. This is particularly relevant in those situations where aquifers cross cultural, political or national boundaries.
3. Make the maintenance and restoration of hydrologic balance a long-term goal of regional water-management strategies. This requires that water managers identify options to: minimize net losses of water from the hydrologic system; encourage effective and efficient water use, and ensure the fair allocation of water for human use as well as ecological needs, taking into account long-term sustainability. Hydrological, ecological, economic and socioeconomic assessments should be an integral part of any water-management strategy.
4. Improve scientific, engineering and applied technological expertise in developing countries. This requires encouraging science-based decision-making as well as "north-south" and "south-south" cooperation. Further, it is important that funds be allocated for programs that encourage the design and mass-dissemination of affordable and low-energy consuming water harnessing devices for household and irrigation.
5. Establish ongoing coordinated surface water and groundwater monitoring programs. This requires that data collection become an integral part of water-management strategies so that such strategies can be adapted to address changing socio-economic, environmental, and climatic conditions. The corresponding data sets should be available to all the stakeholders in a transparent and easy way.
6. Develop local institutions to improve sustainable groundwater management. This requires that higher-level authorities become receptive to the needs of local groups and encourage the development and support of strong institutional networks with water users and civic society.
7. Ensure that citizens recognize groundwater's essential role in their community and the importance of its responsible use. This requires that science and applied technology serve to enhance education and outreach programs in order to broaden citizen understanding of the entire hydrologic system and its global importance to current and future generations.