INTRODUCTION[1]

The use of groundwater from springs, shallow dug wells and infiltration galleries dates back many centuries. However, it wasn't until the advent of the submersible pump and the availability of cheap and efficient drilling methods in recent decades that allowed millions of private farmers in arid and semiarid regions to obtain food in a secure way. In contrast to groundwater development the use of surface water for irrigation has a long tradition, which may be more than fifty centuries old, as in Egypt and Mesopotamia. The construction of large and expensive surface water infrastructures for irrigation –and also for urban water supply and hydropower--was very intensive during the twentieth century in most developed countries. The size, cost and duration of surface water projects—as compared with the small, farm-level development of groundwater supplies, may help to explain why many water decision makers paid little attention to the potential role of groundwater resources as an integral part of water resources policy. Unfortunately, the lack of visibility of groundwater development has allowed it to happen with scarce planning and control by the conventional governmental water agencies and lending institutions such as the World Bank, which have almost exclusively focused on large surface water irrigation.

Concerns about the unfettered and intensive development of groundwater resources have been initially raised at a session (Groundwater Intensive Use: The Silent Revolution) at the Third World Water Forum that was held in Osaka on March 18th, 2003; and more recently in a report on "India's Water Economy", published by the World Bank (28 November, 2005.) Like most revolutions, the effects of the Silent Revolution have been positive and negative. Probably today in this blue planet more than fifty percent of irrigated agriculture's global economic and social value (jobs) is obtained through groundwater use. Yet, the fact remains that millions of farmers have paid little attention to the forecasts of looming collapse of groundwater systems, sometimes defined as a "pillar of sand." They continue to develop groundwater with little planning and control by the corresponding governmental water agencies.

Obviously this situation of lack of reliable data, planning and control is not optimal. A certain number of persons and institutions have tried to call to the attention of the high-level water decision-makers the need and urgency of obtaining a better picture of the situation and of the pros and cons of the intensive groundwater use. The first chapter of this book mentions some of these scientific gatherings. Apparently the first one was a national symposium on groundwater overexploitation held in Almeria (Spain) in 1989. This conference has been followed by other international workshops and symposia, practically all of them held in Spain. A possible explanation of this Spanish interest is due to the fact that Spain is the most arid country in the European Union. The Spanish Water Code of 1986 introduced the concept of groundwater overexploitation but the enforcement of the provisions related to this concept has been fraught with great difficulties.

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The Interacademy Panel for International Issues (IAP)--a kind of World Federation of Academies of Sciences, with a membership of one hundred Academies--developed a Water Program (2004-2006) to analyse the main water problems in the world from the neutral and scientific perspective that characterizes the work of Academies of Sciences worldwide. One of its first activities has been to study the issue of Groundwater sustainability. This activity was delegated to the Spanish Academy of Sciences, in view of the large experience and tradition of Spain in water issues. The Spanish Academy obtained the enthusiastic support of the many institutions that are mentioned in the first chapter of this book. Here I want only mention the crucial support of the USA National Groundwater Association (NGWA), the Instituto Geológico y Minero de España (IGME) (Geological Survey of Spain) and UNESCO.

The International Symposium on Groundwater Sustainability was held at the University of Alicante on January 24 to 27, 2006. It gathered twenty-five experts from different disciplines and parts of the world to exchange experiences and opinions about the challenges and opportunities presented by intensive groundwater use. Their preliminary manuscripts were collected in a CD-Rom and distributed to all Symposium participants. The second part of this book contains a revised version of these contributions, modified by the authors after hearing the debates held during the Symposium, and following the peer reviewed process according to the Standards of the NGWA.

The book also includes the documents presented in a closed workshop held prior to the Symposium, on Monday January 23, 2006. The participants were high-level water decision-makers from twenty-five countries. They presented their view on the main issues in relation to groundwater sustainable use in their respective countries. Their points of view were afterwards debated with the Scientific Committee of the Symposium.

Many authors coincide in considering that the concept of sustainability is really elusive and has so many dimensions that it can be easily misused. The reader of this book can observe that the opinions presented in the different chapters may not be unanimous. However, a good agreement was obtained in the preparation of the Alicante Declaration, an action agenda for sustainable groundwater use worldwide, and which is also included in this book.

As chair of the Organizing and Scientific Committees of the Symposium I want to close this presentation with the expression of my gratitude to all those that have collaborated in its results, but I consider fair to mention especially Stephen Ragone of the NGWA, and Juan Antonio Lopez Geta and Africa de la Hera of the IGME, and Nuria Hernandez-Mora. Their collaborative efforts made this Symposium a success.

M. Ramón Llamas