Prelude

Ground water is a distinguished component of the hydrologic cycle and Leonardo da Vinci rightly envisioned that "The greatest river of the earth flows underground". This statement signifies the magnitude of groundwater availability as well as the importance one has to confer for its sustainable development and conservation of aquifers. India is endowed with varied hydro-geological formations ranging in age from Archaean to Recent that have resulted from diversified geological, climatological and topographic setups. These, along with space-time variable annual water cycle, shape groundwater repositories in respective river basins and regions of the country. Due to diverse hydrological and hydro-geological setups, spatial and temporal distributions of groundwater availability are non-uniform and range from plenty to scarce. Moreover, usage and dependence on ground water also vary from region to region, largely governed by the socio-cultural, socio-economic, and climatic character of the respective region.

Ground water possesses some unique features, such as: usually it travels very slowly at a typical average horizontal velocity of 100 m/year and vertical velocity of 1 m/year. As such, it has a large residence time and we are benefited by the nature's bounty in the form of a large storage of fresh groundwater in the aquifer that is generally considered safe from pollution. These advantageous features have perhaps helped to develop a biased view of the groundwater situation, viz., ground water is easily available, and it is easy to tap and can be drawn on demand. A significant portion of the population of the country has come to increasingly depend on ground water for use in agriculture and other economic sectors as well as for domestic supplies. This sudden boom in groundwater development has triggered large-scale depletion of groundwater levels resulting in failure of wells, rising energy use and pumping costs, heightened conflicts regarding groundwater sharing and disparity in priorities of allocation, increasing threat to availability due to the interfering polluting matter, saline water intrusion in coastal aquifers, etc. For long-term sustainability of the use of groundwater resource, there is an urgent need to derive appropriate groundwater management policies and control strategies adequately supported by suitable regulations and legislation measures.

The issues of groundwater governance, its ownership and incentives including pricing need a national debate to arrive at a consensus among stakeholders, planners, managers and environmentalists. Pursuant to this, Indian National Committee on Hydrology (INCOH), a constituent body of Ministry of Water Resources, has sponsored the 12th National Symposium on Hydrology with focal theme on **"Groundwater Governance: Ownership of Groundwater and its Pricing".** The National Institute of Hydrology, and the Central Ground Water Board have jointly organized the Symposium during November 14-15, 2006, at New Delhi. The technical framework of the Symposium has been designed to address five focal themes. These are: (i) Groundwater Management: Emerging Challenges, (ii) Groundwater Governance: Institutional and Legal Framework, (iii) Groundwater Ownership and Water

Rights—Legal Aspects, (iv) Sectoral Allocation of Groundwater and its Pricing, and (v) Stakeholders Participation in Groundwater Governance. An enormous response was received in the form of contributed scientific papers, which dealt with outcome of specific applied research, analysis of physical cases, thoughts, and views under each theme. However, the number of papers accepted for presentation in the two-day Symposium had to be restricted due to time constraints. Invited key papers under each theme have been contributed by eminent personalities. State water-related departments are the actual management bodies of groundwater resources in the field. Without their feedback and contribution, a factual articulation of the objectives of the Symposium could not have been achieved.

This volume contains scientific papers contributed by eminent personalities, researchers, academicians, practicing hydro-geologists, groundwater departments, industries, NGOs, etc. The volume has been organized theme-wise with a key paper in the beginning of each theme followed by papers related to relevant aspects. A brief report on each paper has been prefixed in the initial pages for benefit of the readers. The statements made in each paper are authors' individual views. It is believed that this compilation of papers would provide the necessary inputs to derive and support an effective groundwater management policy and governance strategy for the country as a whole.

We gratefully acknowledge the sincere efforts made by various authors to present their analyses, perceptions and thoughts. It is, in fact, the Technical Committee of the Symposium, which has reviewed and selected all the papers included in this volume. We deeply acknowledge the selfless services rendered by the Technical Committee. Efforts made by the scientists of the National Institute of Hydrology and the Central Ground Water Board in reviewing the technical papers are also duly acknowledged. The volume has been printed using partial financial support extended by different sponsoring organizations. We are thankful to those organizations for providing financial support.

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Dr. Saleem Romani
Dr. K.D. Sharma
Dr. N.C. Ghosh
Mr. Y.B. Kaushik
Editors