

FOREWORD

Groundwater has been the primary source of water for meeting domestic needs of more than 85% of rural areas and 50% of urban and industrial areas, besides fulfilling requirement of about 55% of irrigation water. Being a common pool and hidden resource, exploitation of groundwater resources in many places in the Country has taken place indiscriminately without caring for hydrogeological features of aquifers, and consequences that may emerge in the long run. Despite favorable national scenario on the availability of groundwater, over recent years, in some parts of the Country increasing abstraction to meet rising demand for domestic supplies, industries and irrigation has raised concerns for sustainability of the resource and the livelihoods it supports. In the last two decades, the number of groundwater structures in India has increased from 12.3 million as in year 1983 to 17.3 million during year 1997. The ease and simplicity in extraction of groundwater have played important roles in its growing development. That has, however, given rise to haphazard and indiscriminate use of this resource in many parts of the Country resulting in depleted groundwater level, scarcity of dynamic groundwater resources including deterioration of groundwater quality.

Water harvesting, and artificial groundwater recharge are currently being promoted for solutions to water scarcity in many regions in India. Both Central and State Governments' groundwater departments have conceived "artificial groundwater recharge" as one of the potential alternatives to augment groundwater supplies and to restore aquifer potential in areas where over-development has depleted the aquifer. Check dams, infiltration structures, injection wells, anicuts, etc. have acquired popularity as artificial recharge structures. Accumulated rainwater and in many places, particularly in urban areas, roof top rainwater harvesting are providing the possible source of water for artificial groundwater recharge. A recharge structure would prove to be effective if the benefits, constraints and uncertainties associated with aquifer are considered and addressed realistically, particularly, the aspects representing technical, societal, economical and environmental impacts. Management of aquifer recharge aiming at groundwater resources augmentation, maintaining impacts on the water cycle, coherence and contribution to support and strengthen livelihoods under the available or improved institutional framework, can bestow a commanding and appropriate scientific approach to cater sustainable resolution to all these concerned issues.

In order to give better understanding of scientific and technological know-how on artificial groundwater recharge and its limitations, scope and forcing issues; the course material prepared by different resource persons and included in this volume as training document for the Workshop on "Artificial Groundwater Recharge and Aquifer Management" jointly organized by the Water Resources Development Directorate, Govt. of West Bengal and the National Institute of Hydrology, Roorkee during 05-10 October, 2009 at Kolkata is a comprehensive compilation of text material on the subject matter. I would like to place on record my deep appreciation of the efforts made by different resource persons, and also believe that the course material presented in this document will help the participants and other readers immensely in understanding the subject matter.

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