

## **Rapporteur's Report on Groundwater Management - Problems and Issues: Session - II**

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Groundwater is a crucial input in agricultural development and amongst the renewable natural resources, it commands a prominent position. However, its excessive use for irrigation has raised issues like sustainability of irrigation based agriculture. Hence, it became pertinent to discuss the manner in which use of groundwater can be sustained longer and it is equitably distributed.

Against this background, the four papers discussed in the second session of the seminar attempted to analyse the various issues and problems relating to groundwater management. To start with, out of the four papers, the first one by Dhawan sought to define and explain the management of groundwater exploitation. The other two papers, one by Saleth and other by Narayanamoorthy, focused on two different perspectives encompassing tariff policies governing groundwater management. The paper by Chandrakanth and Shivakumarswamy underscored the effect of well interference on overall water management. Except this paper the other papers were discussed in the absence of the authors.

Dhawan's paper (which is not included in this volume as it is published in Dhawan (1995)) focused on the development and distributional aspects of groundwater management and has taken into account specifically four states, namely, U.P., Gujarat, Punjab and Tamil Nadu. It was pointed out that the groundwater resources in these states are not overexploited. The article examined, with the help of the available evidence, the issue of overexploitation and addressed the crucial question that arose at this juncture about volumetric vis-a-vis area approach towards measurement of groundwater. Hence, to look at overexploitation other data sources need to be explored. The author has suggested three alternatives in order to look at the overexploitation of groundwater. These are: the volumetric approach, the area irrigated approach and the water table approach. The volumetric approach has been found to be the most convenient as in this approach, one compares groundwater recharge with actual utilisation in volumetric terms. The area approach to groundwater exploitation involves comparing the area planned to be irrigated by wells and tubewells as against the actual irrigated area. The difficulty in this approach is that it is mainly based on the estimates prepared at the time of the plan formulation. The third approach deals with the actual depletion of groundwater resources as measured through water table comparisons.

Saleth's paper includes the evaluation of the efficacy of power tariff as an instrument of groundwater regulation based on theoretical and practical reasoning and demonstrates the sustainability, efficiency and equity implications in the use of groundwater with the help of a electricity demand curve. The author argued that this curve is not continuous throughout and it has a kink which is determined by economic, agronomic, hydrological and technical factors. Furthermore, there is a high probability that the farmers will switch to diesel pumpsets provided such energy switching is technically and economically feasible. Under these conditions, the author has proposed two alternatives for fixing power tariffs. Firstly, it can be determined based on its cost of generation and distribution and secondly, by equating it to its next best alternative namely diesel. The author also opined that depletion effects could also have an adverse