



Irrigation and groundwater in Pakistan

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Introduction of large gravity irrigation system in the Indus Basin in late nineteenth century without a drainage system resulted in water table rise consequently giving rise to water logging and salinity problems over large areas. In order to cope with the salinity and water logging problem government initiated salinity control and reclamation project (SCARP) in 1960. Initially 10,000 tube wells were installed in different areas, which not only resulted in the lowering of water table, but also supplemented irrigation. Resulting benefits from the full irrigation motivated framers to install private tube wells. Present estimate of private tube wells in Punjab alone is around 0.6 million and 48 billion cubic meter of groundwater is used for irrigation, contributing is \$ 1.3 billion to the economy. The Punjab meets 40% of its irrigation needs from groundwater abstraction. Today, farmers apply both surface water flows and groundwater from tubewells, creating a pattern of private and public water control. As the importance of groundwater in sustaining human life and ecology is evident so are the threats to its sustainability due to over-exploitation, but sufficient information for its sustainable management especially in developing countries is still required. Sustainable use of groundwater needs proper quantification of the resource and information on processes involved in its recharge and discharge. Groundwater recharge is broadly defined as water that reaches the aquifer from any direction (Lerner 1997). Sustainability and proper management of groundwater resource requires reliable quantification of the resource. In order to protect the resource from contamination and over exploitation, identification of recharge sources and their contribution to resource is a basic requirement. Physiochemical properties of some pesticides and their behavior in soil and water can make them potential tracers of subsurface moisture movement. Pesticides are intensively used in the area to control pests of cotton, sugar cane and rice crops. Field work has been conducted in the groundwater-irrigated area in the Rechna Doab in the Indus Basin. First results will be discussed.