

SALT BALANCE AND SOIL SALINITY HAZARD IN PUNJAB RIVER SYSTEM: AN OVERVIEW

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ABSTRACT

The Punjab River System (PRS) consists of five Rivers and a net-work of canals and inter-river canals. No doubt, such irrigation developments have brought a great prosperity to the people by enhancing the agricultural capability of the province. On the other hand, sodicity and salinity surfaced up as a water short, water excess dilemma. Poor maintenance, higher cropping intensity, low delivery efficiency from canal head to crops root zone and over-use of the system resulted in a substantive water deficit. Consequential to water deficit, conjunctive irrigation use began to emerge in canal command area (CCA). About 70% of the tubewells are estimated to pump water of inferior quality. The Punjab development statistics show that tubewells (both in public and private sector) increased many times. In 1996-97, 4.5×10^5 tubewells were reported against a number of 2.6×10^5 in 1988-89. Calculations show that tubewells are adding a salt load @ 129.06 million tons (mt) per year. Contribution from shallow water table through capillary phenomenon further adds 0.14 mt of salts. The deployment of tubewells at that large scale has badly disturbed the salt balance in the river basin. Canal water, no doubt, is excellent in quality but due to restricted drainage in the irrigation basin also adds 20.99 mt of salt load (assuming 276 g m^{-3} total soluble salts) every year through 55.94 million acre foot (MAF) water, allocated to the Punjab. The salt balance equations show that salts exported out of the Punjab through Gaddu Barrage and the salts removed through leaching and crop harvest (80.59 mt) did not match with the salt flux added (150.19 mt) to the irrigated lands. The serious disturbance in SALT BALANCE, groundwater being the main contributor, has induced SECONDARY SALINITY in the basin, which is becoming a threat and gaining a dominant position over the genetic salinity. Presently, about 12.38% of the (CCA) is affected by salinity and sodicity. This menace if allowed to go unchecked will turn most of the irrigated soils unproductive. Sensing the future course of irrigated agriculture in context of salt balance therefore, has become imperative. It is also suggested to the actors involved in irrigation management to harness the water resources and strengthen the irrigation, drainage, research and developmental capability of the system, so that a prosper future can be imparted to the coming generations.