

Effect of Shallow and Saline Groundwater on Drain Water Salt Load in South Khuzestan

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ABSTRACT

Drainage water has to be disposed of, and in many cases they are disposed to rivers as a receiving water bodies. In order to attain sustainable river management, optimum use of water resources and reduction of the adverse effect of development, it is compulsory to prepare a plan for drain water management. In this research the mathematical model for forecasting the drain water quality in reclamation period is prepared based on water and salt mass balance in soil column. The control volume was between the drainage level and the soil surface and the soil condition was assumed saturated. Leaching experiment was executed in 10 hectare field in the south Khuzestan plain, SW Iran. Salinity and volume of the leaching water and drainage water during the experiments and soil before and after experiment were measured. Drain water salinity during the experiment was almost constant and very close to the groundwater salinity, and therefore there is no conformity with the mass balance model (between soil surface and drainage level). It shown that the shallow and saline groundwater table is highly affecting drain water salinity during initial leaching. So, as the main source of salt load in drainage effluents, control of shallow and saline ground water must be more considered in design and operation steps.

KEYWORDS: Groundwater, Impervious Layer, Leaching, Reclamation, Salinity

INTRODUCTION

At present around 20-30 million hectares of the world's 260 million irrigated lands are affected by salinity (FAO, 2002). Therefore drainage development is inevitable especially in salt affected lands for the optimum plant growth. Effluents of such drainage systems must be disposed of and usually they disposed in the rivers and other water bodies. On the other hand, although a clear picture has not been presented in this regard, but numerous cases of problem of drain water removal from vast irrigated land have been reported in areas such as South Asia, South East Asia, Central Asia, North Africa, Middle East, Australia and the United States of America (Iranian national committee on Irrigation and drainage, 2001) how can hardly damage river quality.

Khuzestan plain is one of the most important agricultural areas in Iran and the biggest rivers of the country flow through this region. There are More than half million hectares of irrigation and drainage networks in this area either under study or under construction. The