

The Rajasthan Agricultural Drainage Research Project (RAJAD,1995) is a large scale applied research project on the use of horizontal sub surface drainage and associated water management techniques to control soil salinity and water logging problems in irrigated agricultural lands. The specific goal is to improve agricultural productivity of the farmers in the chambal command area. The total command area is 385,000 ha of which 229,000 ha are under irrigation.

Soil salinity and water logging problems within the chambal command area result from a number of causes including canal seepage, excess water from on farm irrigation practices, lack of effective surface drainage system to drain surface runoff from monsoon precipitation and poor internal drainage characteristics of the soil. For this project a total of twelve sites covering approximately 1400 ha were selected to represent the irrigation and soil conditions within the selected drainage blocks of the chambal command area. To achieve maximum water table control regardless of the source of the excess water during irrigation and the monsoon conditions, horizontal sub surface drainage were installed in the command area.

Based on the research findings, the following conclusions were drawn: (i) there is no universal subsurface drainage design method to control different conditions of salinity and water logging in semi arid irrigated areas (ii) a range of drainage coefficient values (1 to 4m/day) were found to satisfy salinity and varying degrees of water logging control. This drainage coefficient range reduces the water table to a level of 20-40 cm below ground surface within 3 or 4 days. (iii) for design of sub surface drainage saturated hydraulic conductivity tests were done during the monsoon period on a 5 to 10 ha grid intervals. The values varies from 0.25 to 0.55m/day for the top 1 m of the soil profile, 0.02 to 0.20 m/day for the 1 m to 1.5 m layer and 0.75 m/day for a soil below a depth of 1.5 m (iv) based on the flow rates and corresponding water level changes, the drainable porosity of the soils varied from 2 to 5 percent. (v) a practical drain depth of 1 to 1.5 m are applicable for chambal command area (vi) gravity outlets are preferred to pumped outlets because of low capital costs and subsequent maintenance requirement and (vii) on an average 60 m spacing is considered adequate for salinity reclamation and control and the installation cost of sub surface drainage is Rs 17,000/ha for a 25,000 ha area installed under one contract. Similarly a 30 m drain spacing which is considered adequate for both water logging and salinity control, estimated cost is Rs 23,000/ha for a drainage area of 25,000 ha.

Central Soil Salinity Research Institute(CSSRI),Karnal has also carried out significant work in the area of salinity identification and mapping,surface and sub surface drainage for control of saline and water logged lands,surface and ground water quality. Table A1 shows the basic features of a number of sub surface drainage projects carried out by the institute.Gupta (1991) presented the crop tolerance values for different crops based on salt tolerance trials at a number of sites in India as given in Table A2 .Various pre and post independence sub surface drainage work for water logged and saline soils are shown in Table A3 .Recent sub surface drainage work at various centers in India are shown in Table A4 .