

Increasing Production by Reclaiming Deteriorated
or Abandoned Saline Land

Two types of saline farm land exist in West Pakistan: (1) land where the water table is at a sufficient depth to prevent appreciable upward movement of ground water, but salination has occurred because irrigation was inadequate to meet the leaching requirement; and (2) land where salination has occurred through upward movement and evaporation of ground water from a shallow water table, in addition to failure to meet the leaching requirement. Reclamation of land of the first type may be effected by ponding water on the land so as to induce leaching. Reclamation of land of the second type can also be effected in the same way, but an essential prerequisite is, either lowering of the water table by horizontal drainage, or induction of a downward movement of water from the fields by pumping underground water upward to the surface in wells, and either draining it off or spreading it on the land.

Table 2.6 presents estimates of the increase in yields attainable by desalination. The yield of crops having high salt tolerance, such as wheat, cotton, and barley, is much reduced in soils with a salt content of more than 0.4 to 0.5 percent. Crops of low or intermediate salt tolerance, such as pulses, maize, sugar cane, and rice, show a marked decrease in yield, when the soil salt content is above 0.15 to 2 percent. For example, as Table 2.6 shows, the yield of sugar cane can be almost tripled, provided other factors of production are favorable, by reducing the soil salt from 0.2 to 0.1 percent.

As a general rule, in areas where the permeability has not been reduced by increase in exchangeable sodium, about 50 percent of the salt in the root zone can be removed by applying 6 inches of water for each foot of soil; about 80 percent can be removed with additions of one foot of water per foot of soil; and about 90 percent can be removed with 2 feet of water per foot of soil. Because of the high solubility of most salts, high-salt waters can be used during the initial stages of leaching operations. In fact, if soil permeability is low owing to the presence of exchangeable sodium, the use of high-salt water will increase the rate of water movement. The final increment of leaching water, i.e., 8 to 12 inches, should, of course, be of acceptable quality for irrigation.

It is likely that at least 6 million acres of culturable land under canal command in West Pakistan have an average salt content in the top 3 feet