Salinity control is one of the major objectives of drainage, the other of course being the removal of excess water. These objectives are not entirely unrelated, although problems with excess water usually occur in the absence of salinity. Excess water may, however, induce high water tables which, if saline, contribute to salination of soils.

Soil salinity may be defined as any accumulation of soluble salts that may be harmful to plants. Salinity is of limited concern in humid regions, occurring naturally only in coastal areas subject to sea water intrusion or flooding. Intensive fertilization sometimes causes transitory localized soil salinity. Increasing supplemental irrigation in humid areas is introducing additional salinity problems analogous to those in arid and semiarid regions.

In irrigated areas, salinity is almost a universal threat because irrigation waters normally contain hundreds and in extreme cases thousands of mg/liter of salts in contrast to the approximately 10 mg/liter usually found in rainwater. When irrigation water contains 735 mg/liter of salts, a ton of salt is added with each 1,230 m$^3$ (acre-foot) of water applied to the land. In addition to salts introduced by irrigation, soils in arid regions may contain salts of geologic origin. Poorly developed surface drainage features often result in a concentration of salts in inland basins instead of their discharge into the sea.

In humid regions drainage is needed mainly to remove excess water so surface, as well as internal, drainage may be helpful. In drier zones excess surface waters are much less often a problem; moreover, surface flushing of saline soils is ineffective in removing soil salts even when these occur in crusts on the soil surface (Reeve et al., 1955). Since salts in the soil can be removed effectively only by leaching, internal soil drainage becomes the key to soil desalination and salinity control.

A. Irrigation Water Quality and Soil Salinity

When soil water is derived from irrigation, the soil water is at least as saline as the irrigation water and usually more so. The increase in salinity