

5) In semi-tropical climate the stagnant water and swampy reaches of open drains may constitute a public health hazard. The ditches afford a favorable environment for the growth of mosquitoes and snails. In other countries endemic and epidemic levels of morbidity from malaria and bilharziasis have been caused by horizontal drainage works that have not been properly maintained.

A Comment on Sub-irrigation

One of the arguments for a horizontal drainage system is that by keeping the watertable close to the surface a considerable fraction of the seepage from canals and water courses can be recovered by the crops through sub irrigation.

In the historical development of most irrigation projects it commonly happens that at one time or another enthusiasm is generated over the possibilities of sub-irrigation as a cheap method of water distribution. When such schemes are tried, however, they are usually found to have serious limitations. In some cases they have failed completely and caused serious land damage. In the United States, there have been two exceptions where sub-irrigation has proved to be more than a fad. One of these is in the San Luis Valley in Colorado, and the other in the Snake River Basin in Idaho. In both of these places the following favorable conditions obtain:

i) the slopes of the land and watertable are relatively steep so that stagnation does not occur; and

ii) the soil and subsoil are permeable (in the San Luis project the soil is almost a fine gravel, in Idaho the aquifer is a coarse-textured volcanic ash). Sub-irrigation at these sites has worked because it is possible to drain the soil thoroughly during the non-irrigation season. The soil is recharged in the spring; after the harvest the watertable is lowered and the salt carried away.

We conclude that sub-irrigation, as well as conventional horizontal drainage, might find limited application in certain localities of West Pakistan under special geological and hydrological conditions. Neither of these methods warrant much attention, however, in the primary scheme of water resource development in the Indus Plain.

CONCLUDING REMARKS

Agricultural production has shown heartening progress in the past two or three years, particularly in regions where traditional supplies of irrigation water have been enhanced either by government tubewells, as in SCARP I, or by private tubewells as in the upper part of Rechna Doab. Farmers have taken advantage of the improved water supplies with admirable alacrity. The trends in crop yields per acre and particularly in the intensity of cultivation both reflect