

Is California's Irrigated Agriculture Permanent?



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IRRIGATION AGRICULTURE requires that men learn to work together towards a common goal. It is not surprising, then, that our early civilizations arose in those arid regions where the productivity of the land was dependent upon irrigation works and their proper management. These early civilizations, however, have gained the reputation of being only transitory. As the productivity of the land improved with irrigation, urban civilization grew and flourished. As productivity declined, sometimes drastically, men became divided, and the civilization faded away.

Productivity declined largely because the land became salinized. The natural earth salts, brought into the productive region dilute in the irrigation water, were not exported adequately to an ocean or other sink, as nature does, so as to provide basin salt balance. This can happen in California, gradually and slowly, because we do not have basin salt balance.

Under nature, most salts generated on watersheds flow to the ocean or other sink, and the river basin system is in "basin salt balance" — the salts coming into each part of a river basin system are exported to an ocean or other sink. Irrigated agriculture is a large consumptive user of water, and efficient use of water dictates minimizing waste — the basic mechanism for the export of salt. Most is actually being stored in the unsaturated zone above the ground water table. Gradually, the ground waters at the lower end of each basin becomes more saline, and this salinity will creep upstream. In large basins, this can take many years, even hundreds.

Today's best remedial measure is agricultural tile drainage, and it is a rather complete mechanism with the stratified soils of the Colorado River region. It can only be a partial, although important, mechanism in the other parts of California. The brackish effluent of tile systems must be discharged into a salt bypass, whence it will be carried to the ocean or other sink, rather than to

contaminate downstream lands. Future consumptive use of such water for cooling purposes in electric power generation can decrease the water volume, making the task of exporting the salt cheaper. The partial desalting techniques now being developed are envisioned as future mechanisms in the task to achieve basin salt balance. They will divide brackish water into two streams — one good water for use, and one a more concentrated brine for more economical export.

San Joaquin

Our most serious basin salt balance problem is in the San Joaquin Valley. Only a part of the local and imported salt is discharged into San Francisco Bay. The greater part is simply accumulating. Some 15 years ago, California's excellent Department of Water Resources did plan a "San Joaquin Master Drain," a salt bypass, as the logical first step for solution to the problem. The flow was to be discharged into San Francisco Bay where the drain water would be superior in quality to the Bay water. Because of lack of public understanding of the problem, and because of confusion in the question of equity in payment of the cost, the Drain has not yet been built.

After study of the situation of the San Joaquin Master Drain, and who contributes to its need, it is my conclusion that the only equitable policy would be to treat the capital costs as a nonreimbursable public expense. All occupants of the San Joaquin Valley contribute to the problem. The City and County of San Francisco contributes because it by-passes the Valley system with high quality water, denying dilution. The East Bay Municipal Utility District contributes in similar fashion. And, the entire population of California benefits from, and is dependent upon, the agricultural productivity of the San Joaquin Valley. Achievement of salt balance throughout California is the obligation of all.