



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Modeling Approaches to Salt Management Problems in Irrigated Agriculture: A Review

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Abstract: Irrigation projects have been developed throughout human history to increase food production, but they frequently contribute to salinization and drainage problems as well. Examples where salinization and drainage water disposal due to agricultural activity are a critical problem can be found in irrigated areas in different parts of the world. To find possible solutions to irrigation and drainage related problems, government agencies, scientists, and soil and water resources managers recommend a broad array of management alternatives for conducting investigations. The concept of management alternatives of salinization and drainage problems can be evaluated by field experiments and/or by simulating conditions with reliable numerical or conceptual models. This paper provides a review of the implementation of modeling approaches for evaluating commonly proposed salt management alternatives on two different spatial scales: (1) Local (farm) scale, and (2) Regional scale. The conceptual and numerical-hydrologic modeling efforts presented here were generally limited to assessment of the effects on surface or groundwater quality. However, the development of a spatially and temporally distributed agroeconomic model using economic and hydrologic submodels might be a promising approach for better evaluation of management strategies. After accomplishing integration of hydrologic processes with economic submodels, the economic, environmental and social impact of management alternatives can be quantified to address the ubiquitous salt and pollution issues of irrigated agriculture, with potential application to arid and semiarid regions such as Turkey in the future.

Key Words: Salinization, salt management alternatives, drainage water reuse

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