

# Economics of Irrigation Systems in Some of the Egyptian Desert Areas

The Agricultural sector plays an important part in economic development of the Arab Republic of Egypt. So, the agricultural production should be developed to improve its contribution to the integrated economic development. It should be mentioned that the irrigating water resources has become one of the main limitations of the horizontal development. The research problem is based on the assumption that the prevailing use of irrigating water resources proved to be deviated from the optimum use. So, the main objective of this study is to investigate the economics of irrigation systems in selected Egyptian desert regions. The study comprises an introduction and four chapters. The first chapter deals with the theoretical framework and review of literatures related to economics of irrigation systems. The second one deals with the economic analysis of irrigation systems in the study sample. This chapter is divided into two parts, the first part discusses the description of research sample, while the second one analyses the economic efficiency of irrigation systems in the study sample. Some economic criteria such as ratio of net return per feddan to the weighted average production cost per feddan and ratio of net return to weighted average of irrigation cost, have been applied. It has been found that Belbase region showed its superiority to New-Salhia region with respect to the estimated economic criteria and under the studied irrigation systems with reference to the first criterion, the average net return per unit of production costs amounted to L.E. 0.20 and 0.36 under Drip Irrigation versus L.E. 0.48 and 0.42 under sprinkler irrigation for the above mentioned two regions respectively. Concerning the second criterion, the average net return per unit of irrigation cost amounted to L.E. 3.9 and 11.3 under Drip Irrigation versus L.E. 7.4 and 0.82 under sprinkler irrigation for the two regions respectively. From the third chapter, the estimated production functions of Grapes, Mangoes and peach, showed the decreasing return to scale, while the aggregate production elasticity for citrus, apples, bananas and olives, revealed the increasing return to scale. The production function of date palms indicated that inputs are inefficiently used under Drip Irrigation. Under the Sprinkler Irrigation, the wheat production function showed the decreasing return to scale. With reference to El-Salhia, the estimated production functions for grapes, citrus, Mangoes, pepper, tomatoes, cantaloupe, Pear, showed the decreasing return to scale under Drip Irrigation. Also, the wheat production function indicated the decreasing return to scale under the sprinkler irrigation. In the fourth chapter, the cost function of the studied crops in Belbase under Drip Irrigation have been analysed. It has been concluded that resource use, in apple, date palms, Bananas and citrus, proved to be in the first stage of production. But the resource use of the other studied crops proved to be in the economic stage of production. Under the Sprinkler Irrigation, the resource use in wheat production proved to be in the ineconomic stage. Concerning the resource use in the studied crops under Drip irrigation in El-Salhia, proved to be in the economic stage. Also, the resource use in wheat production under Sprinkler Irrigation proved to be in the economic stage. Based on the study findings, some problems that faces the desert agriculture, have been reached. So, the study presented some recommendations that may help policy makers and final users to improve the efficiency of modern irrigation systems and to rationalize the irrigating water resources.