

Monitoring and Evaluation of Irrigation Management Projects in Egypt

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Abstract

The fewer the water resources, the greater the demand and the more important water becomes. This applies in Egypt, where rainfall is rare and most of the country is desert, except for a narrow strip of cultivated land and urban areas along the Nile river course. Like other large rivers, the Nile Delta region is characterized by large tracts of rich fertile agricultural land, overpopulation and unique and delicate environmental conditions caused by mixing drainage and freshwater. Managing these unique natural resource areas has become increasingly critical, given the threat to the ecological balance in these areas due to an increase in water exploitation to boost population and the development of resources. Accordingly, the performance of water-delivery systems, particularly irrigation systems, must be clearly defined and assessed under these current or expected stressed conditions. This paper highlights irrigation, drainage and water-management projects in Egypt and presents the positive and negative effects as well as the role of government and users in operating and maintaining the system. The objective is to identify significant research programs and projects carried out over the last three decades that have impacted on irrigated agricultural practices in Egypt. The study documents both successful and failed cases of direct and indirect research uptake. Specific recommendations for increasing the research uptake, improving the penetration of research results and taking corrective measures to strengthen and encourage research uptake to irrigation and drainage practices are highlighted.

Discipline: Irrigation, drainage and reclamation

Additional key words: canal, drainage, Nile, water resource

Introduction

Water scarcity is a growing global problem; challenging sustainable development and constraining efforts to produce enough food to meet increasing food needs (Molden 2007, 2010). Irrigation accounts for 70% of all water used on the globe; a percentage that approaches 85% when considering the rare water in the Near Eastern countries (FAO 2007). Egypt is one of the worst-affected countries, because of its aridity and a fixed share of limited Nile water. The Nile river ends in a unique delta region that extends over around 2.52 million ha of alluvial soil, while another batch of alluvial soil extends over about 1.05 million ha along the Nile stem upstream.

The total water used from various sources in Egypt is about 76.5 billion m³, according to the latest estimates (MALR 2009). The Nile river supplies 73% of this demand

directly, while the remainder mostly comes indirectly from the Nile (its groundwater aquifers, reusing agricultural drainage water and return flows from the river). High population growth over the past 30 years, and related industry and agriculture has increased the demand for water and will continue to do so in future. By 2017, total water demand is projected to reach about 93.5 billion m³, which is almost double the fixed available supply. Climate change and global warming are further concerns exacerbating the severity of water shortages. This means the gap between available resources and water needs is getting wider over time and Egypt will soon face water scarcity (FAO 2007).

Irrigation canals are classified into main (first-level) canals, branch (second-level) canals, distribution canals (*mesqas*, or third-level canals which service areas from 15 to 50 ha) and irrigation ditches (*merwas*, which service areas up to 5 ha) as shown in Figure 1.

Irrigation of old lands in Egypt is currently confronted

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