

Preface

Agriculture in the arid climate of Egypt has a long history—over 5,000 years—that has been wholly dependent on the Nile River. In ancient times, basin irrigation used the yearly floods of the Nile, but beginning in the nineteenth century (the era of Mohamed Ali), attempts to exploit the Nile River more efficiently were undertaken with the construction of weirs and dams in the river to control the flow of the Nile. This is considered the start of modern agriculture in Egypt. Some 160 years later, the Aswan High Dam (AHD) was built and has been completely controlling the Nile's flow since 1964. The AHD has accordingly eliminated the yearly floods and mud sedimentation downstream, which had been considered an essential source for the sustainability of Egyptian agriculture, bringing about a fundamental and revolutionary change in Egyptian agriculture and water use. One could say that Egyptian agriculture and water use have entered a new era, and the question arises: What is the result of this new agriculture?

When the construction of the AHD was first proposed, there were many serious arguments among agriculture experts and stakeholders. “Will Egyptian agriculture lose its sustainability if this dam is built?” and “Should the Aswan High Dam even be constructed?” It is now 50 years since the AHD was completed, and quite a bit of experience has accumulated regarding agricultural development and management under the controlled flow of the Nile. We can now confidently address the above questions in the field of irrigation and agriculture.

However, the situation continues to develop and evolve, and the construction of the AHD has already resulted in an interesting history. Answers to the above-mentioned questions at present are not possible without making many assumptions, and it would not be meaningful or productive to speculate. The water resources provided by the AHD have contributed significantly to both the vertical and horizontal development of agriculture, but on the other hand they have intensified the salt accumulation problem in the soil. The AHD has also helped address the great increase in the Egyptian population, which requires significantly more food and water. Larger families and communities present some serious concerns, and over the course of the evolution of water use and agriculture in Egypt, many organizations and researchers have taken action to solve problems that

are emerging one after another. What have the government organizations been doing and how have research activities been contributing to the development of agriculture in Egypt? This dynamic is the main focus of the present book, rather than addressing questions that first arose more than 50 years ago.

The main intention of this book is to describe and analyze what has been going on in the field of irrigated agriculture in Egypt since the AHD was put in operation, with our hope that some useful information and suggestions are provided for the future course of action, particularly in regard to the possibilities and limitations of resource exploitation.

The present is the result of the accumulation of past events. To deeply understand the present state of agriculture and irrigation in Egypt, we need to recognize the development and situation before the advent of the AHD. Therefore, this book covers both the past and the present so that the reader can understand the entire development processes of water, agriculture and land management. The description of the past provides enough information to explain the present situation, but the description is concise; otherwise the book would be enormous. There are other interesting related topics on which many books have been published, but here we have attempted to offer a condensed and informative narrative of the past and present scenarios regarding agriculture and water in Egypt.

One of the special features of this book is the extensive and scientific description of contemporary topics in water and agriculture, especially from the viewpoint of water saving and sustainability in Nile Delta agriculture. This feature is based on field experiments and surveys in a 6-year research project initiated in 2009, the Sustainable Systems for Food and Bio-Energy Production with Water-Saving Irrigation in the Egyptian Nile Basin, a project that continued to advance under the Science and Technology Research Partnership for Sustainable Development (SATREPS), which is supported by the Japan Science and Technology Agency (JST) and the Japan International Cooperation Agency (JICA). This project was launched in concert with the idea that water-saving agriculture with sustainability is the crucial technological goal as Egypt's water demand reaches the limits of the country's available water resources.

As participants in this interdisciplinary project, the Faculty of Life and Environmental Sciences, University of Tsukuba (Japan) and the Faculty of Agriculture, Cairo University (Egypt) have managed the project in a partnership with Tottori University (Japan), the Agricultural Research Center, Ministry of Agriculture and Land Reclamation (Egypt), and the National Water Research Center, Ministry of Water Resources and Irrigation (Egypt). Such Egyptian research organizations have been directly involved in the historical development of the use of the Nile's water. All Egyptian authors and editors of this book are members of these organizations and have been shouldering part of the responsibility for addressing the many challenges presented by the water/agriculture situation in Egypt. This book was thus written in part by individuals who are directly concerned with the outcome of relevant measures taken in the region.

The chapters are organized essentially in historical order: past, present and future. Chapter 1, as the country profile, gives basic information and a description

of the present Egypt with a special focus on its agriculture. Chapters 2 and 3 cover the time before the AHD, and are divided into ancient times and the period after Mohamed Ali. Chapters 4 and 5 address the many challenges presented by the water/agriculture situation in Egypt at the present, and they discuss the construction and operation of the AHD and the developments in irrigation, drainage, agriculture and soil up to the present. Chapters 6 to 10 deal with the present irrigation and agriculture scenario, especially from the viewpoint of water saving and securing the sustainability of agriculture. Chapter 11 concludes the book, summarizing the present water resources situation in Egypt, a recommended course of action based on the information in the previous chapters, and the present and future challenges related to agriculture and water scarcity.

We convey our appreciation to the JICA and the JST for their financial support of the SATREPS research project in Egypt, which was called WAT (Water-saving Technology) project. Our thanks also go to the University of Tsukuba and Tottori University, Japan, Cairo University (CU), the National Water Research Center (NWRC) and the Agricultural Research Center (ARC), Egypt, for their intensive support to the WAT project. We have been supplied with information accumulated in those organizations. At the same time, we should note that all the opinions presented in this book are private ones of the authors, but not of the institutes. We cannot forget the names of Prof. E. E Abou Steit (Vice president) and Profs Y. Hashem and H. El-Shemy (Deans of Faculty of Agriculture), CU, Prof. M. Abdel-Motaleb (President), Dr. H. M. M. Ali (Director, Water Management Research Institute), and Dr. A. A. Abdel-Motaleb (Director, Drainage Research Institute), NWRC, Prof. A. M. El Banna (President), Dr. M. S. M. Soliman (Director of Field Crops Research Institute) and Dr. M. I. S. Ahmed (Director, Soil, Water and Environment Institute), ARC.

WAT project could not be successful without well managed field experiments, intensive field surveys and discussions on the results. In this regard, we express our special thanks to all the researchers and research assistants who joined the project, especially to Dr. Y. I. M. Atta, Dr. M. Meleha, Dr. A. A. Fattah, Water Management Research Institute (NWRC), late M.A. Nabi, Drainage Research Institute (NWRC), S. S. Naeem, H. B. El-Habat, S. M. A. Bassiouni, Rice Research and Training Center, and Dr. S. Ghorab, Horticulture Research Institute (ARC), and Dr. S. A. Safina (CU).

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