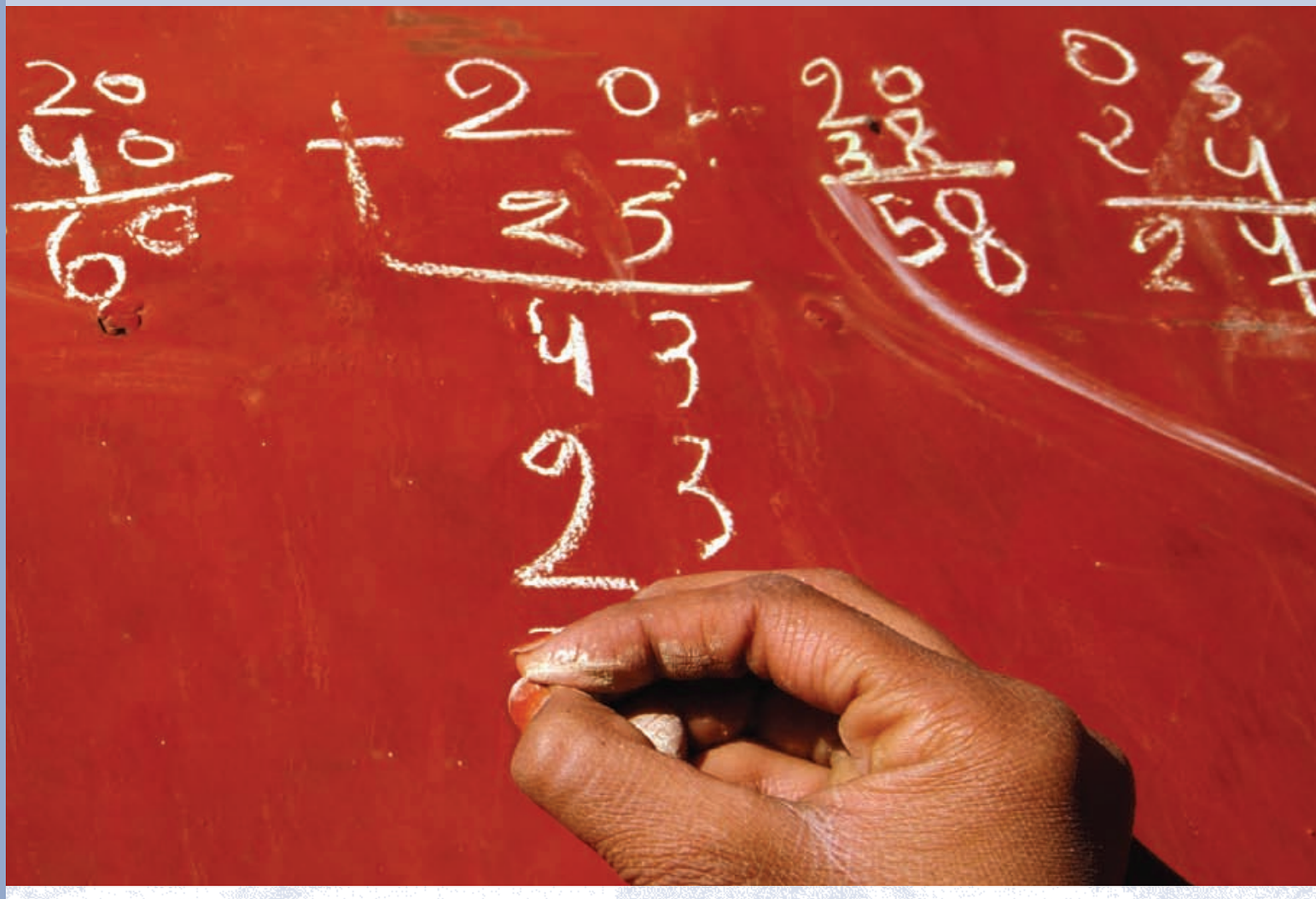
FAO
WATER
REPORTS

34

ISSN 1020-1203

Irrigation in the Middle East region in figures

AQUASTAT Survey – 2008



FAO

Irrigation in the Middle East region in figures – AQUASTAT Survey – 2008

34

Cover photograph:
Swiatek Wojtkowiak

Copies of FAO publications can be requested from:

SALES AND MARKETING GROUP
Communication Division
Food and Agriculture Organization of the United Nations
Viale delle Terme di Caracalla
00153 Rome, Italy

E-mail: publications-sales@fao.org
Fax: +39 06 57053360
Web site: http://www.fao.org

Irrigation in the Middle East region in figures

AQUASTAT Survey – 2008

FAO
WATER
REPORTS

34

Edited by
Karen Frenken
FAO Land and Water Division

FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS
Rome, 2009

ISBN 978-92-5-106316-3

Contents

List of figures

List of tables

Acknowledgements

This report was prepared by Karen Frenken, Senior Water Resources Management Officer and coordinator for the AQUASTAT Programme, with the assistance of Cecilia Spottorno, consultant, both from the Land and Water Division of FAO.

Several resource persons contributed to the preparation of the country profiles: Valentina Grigoryan (Armenia), George Kordzakhia (Georgia), Kourosh Mohammadi (Islamic Republic of Iran), Mohammed Bani Hani (Jordan), Fadi Karam (Lebanon), Salim Al-Mamary (Oman), Mahmoud Hashim (Qatar), Yousef Al-Dakheel (Saudi Arabia), Riza Kanber and Giovanni Muñoz (Turkey), and Abdulkarim Al-Sabri (Yemen). Pascal Marty assisted in reviewing the country profiles.

The authors wish to acknowledge the assistance of Mohammed Bazza, senior irrigation and water resources officer in the Regional Office for the Near East, and Jacob Burke, senior water policy officer in the Land and Water Division, in reviewing the report and especially providing valuable input in the groundwater sections, and the assistance of Elisa Morgera, FAO Legal Office, in reviewing the section on the transboundary river basins. The assistance of Jean Margat in reviewing the information related to the water resources was highly appreciated. Special thanks goes to Pasquale Steduto, Chief of the Water Development and Management Unit, for his continuous support during the preparation of the report.

The country and regional maps were prepared with the assistance of Dorit Groß. English editing was done by Jennifer Parkinson and the publication was prepared for printing by Lynette Chalk and Bouchra El-Zein.

Foreword

Eradication of extreme hunger and poverty and ensuring environmental sustainability are two of the eight Millennium Development Goals (MDG 1 and MDG 7) and the primary focus of FAO. Attainment of these goals is highly linked to water for agriculture and therefore reliable information for indicators linked to these goals is of utmost importance.

The MDG water indicator 7.5, for which FAO's Water Unit is responsible, is the proportion of renewable freshwater resources withdrawn for human use, including agricultural, municipal and industrial uses. This indicator reflects the overall anthropogenic pressure on freshwater resources. Physical water scarcity is taken to occur when more than 75 percent of renewable surface and groundwater are diverted for these uses. At this point, the indicator assumes that water resources development has exceeded the limit of the freshwater system to meet both socio-economic and environmental requirements.

In the Middle East region 12 out of the 18 countries already face physical water scarcity according to this 75 percent criterion. The Arabian Peninsula stands out, with withdrawal values exceeding 100 percent in all countries except Oman. Under these circumstances there is reliance upon withdrawals from non-renewable aquifers (fossil groundwater) and non-conventional sources of water (such as desalination or wastewater reuse) making up the balance.

In view of the unprecedented levels of demand on the already stressed systems of the Middle East region, the need for systematic information on water, its quality and its use cannot be overstated. Further, given that almost 85 percent of the water withdrawal in the region is used for irrigation, accurate and reliable information on agricultural water use is of critical importance. Also, given the number of joint initiatives on transboundary river basins and aquifers in the region, the need for this information to be compiled at basin or aquifer scale is all too evident.

This AQUASTAT report presents the most recent information available on water availability and its use in the 18 countries and territories in the Middle East region, with an emphasis on agricultural water use and management. It contains the relevant tables and maps, and a regional synopsis emphasizing the subregional characteristics of this large and diverse region. It also analyses the changes that have occurred since the first survey in 1997. Finally it gives a more detailed description of four transboundary river basins in the region, highlighting the different levels of cooperation and the agreements between countries located in the same river basin: the Euphrates–Tigris River Basin, the Kura–Araks River Basin, the Asi–Orontes River Basin and the Jordan River Basin.

We hope that this publication will contribute not just to a better understanding of irrigation conditions in the Middle East region but will also inform cross sectoral decision-making related to water development and management.

Alexander Müller
Assistant Director-General
Natural Resources Management
and Environment Department

Parviz Koohafkan
Director
Land and Water Division

Units

Length

1 km = 1 000 m = 1 x 103 m
1 mile = 1.56 km = 1 560 m

Area

1 acre = 4 047 m^2 = 0.4047 ha = 4.047 x 10^{-4} x 1 000 ha
1 are = 100 m^2 = 0.01 ha = 1 x 10^{-5} x 1 000 ha
1 feddan = 4 200 m^2 = 0.42 ha = 4.2 x 10^{-4} x 1 000 ha
1 ha = 10 000 m^2
1 km^2 = 1 000 000 m^2 = 100 ha = 1 x 10^{-1} x 1 000 ha
1 m^2 = 0.0001 ha = 1 x 10^{-7} x 1 000 ha

Volume

1 dm^3 = 1 litre = 0.001 m^3 = 1 x 10^{-12} km^3
1 hm^3 = 1 million m^3 = 1 000 000 m^3 = 1 x 10^{-3} km^3
1 km^3 = 1 billion m^3 = 1 000 million m^3 = 10^9 m^3
1 m^3 = 10^{-9} km^3
1 UK gallon = 4.546 dm^3 = 0.004546 m^3 = 4.546 x 10^{-12} km^3
1 US gallon = 3.785 dm^3 = 0.003785 m^3 = 3.785 x 10^{-12} km^3

Power-energy

1 GW = 1 x 10^3 MW = 1 x 10^6 kW = 1 x 10^9 W
1 GWh = 1 x 10^3 MWh = 1 x 10^6 kMh
US$1 = 1 United States Dollar
1 °C = 1 degree centigrade

The information presented in this publication is collected from a variety of sources. It reflects FAO's best estimates, based on the most accurate and up-to-date information available at the date of printing.

List of abbreviations

ATP	Accelerated Transfer Program (Turkey)
AU	American University
CIA	United States Central Intelligence Agency
CILSS	Interstate Committee for Drought Control in the Sahel
DSI	General Directorate of State Hydraulic Works (Turkey)
ERWR	External renewable water resources
EU	European Union
FAO	Food and Agriculture Organization of the United Nations
GAP	Southeastern Anatolia Project (Turkey)
GLOWA	Global Change and the Hydrological Cycle
GDRS	General Directorate of Rural Services (Turkey)
GDP	Gross Domestic Product
HDI	Human Development Index
IBK	Industrial Bank of Kuwait
ICID	International Commission on Irrigation and Drainage
ICOLD	International Commission on Large Dams
IPTRID	International Programme for Technology and Research in Irrigation and Drainage
IRWR	Internal renewable water resources
IVB	Inland valley bottoms
JMP	Joint Monitoring Programme for Water Supply & Sanitation
MDG	Millennium Development Goal
NIC	National Intelligence Council
OECD	Organisation for Economic Cooperation and Development
O&M	Operation and Maintenance
OSU	Oregon State University
PPP	Purchasing Power Parity
SPC	State Planning Commission in the Syrian Arab Republic
TARWR	Total actual renewable water resources
TNO	Netherlands Organisation for Applied Scientific Research
TRWR	Total renewable water resources
UNDG	United Nations Development Group
UNDP	United Nations Development Programme
UNECE	United Nations Economic Commission for Europe
UNEP	United Nations Environment Programme
UNESCO-IHE	Institute for Water Education

UNICEF	United Nations Children's Fund
USAID	United States Agency for International Development
WDI	World Development Indicators
WHO	World Health Organization
WHYMAP	World-wide Hydrogeological Mapping and Assessment Programme