

World Water and Food to 2025

World Water and Food to 2025: Dealing with Scarcity

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Foreword

The story of food security in the 21st century is likely to be closely linked to the story of water security. In the coming decades the world's farmers will need to produce enough food to feed many millions more people, yet there are virtually no untapped, cost-effective sources of water for them to draw on as they face this challenge. Moreover, farmers will face heavy competition for this water from households, industries, and environmentalists.

By analyzing various policy and investment scenarios, the authors of this book show that how policymakers and water users manage this scarce resource can help make the difference between a food-secure world and one in which water shortages could lead to hunger, poverty, and conflict. With better water management, sound policies, and increased investment in water, farmers and other water users can get more use out of each unit of water and the amount of water reserved for the environment can increase substantially. Continued complacency over the water situation, on the other hand, is likely to lead to a water crisis that will have the direst consequences for the world's poor.

This book is an outgrowth of the shared interest of the International Food Policy Research Institute (IFPRI) and the International Water Management Institute (IWMI) in how water- and food-related policies will affect global, regional, and local water scarcity, food production, food security, the environment, and livelihoods in the long term. In the past four years, IFPRI has developed the IMPACT-WATER model, which is presented and applied in this book to examine water and food policy and investment issues. At the same time IWMI has developed PODIUM, the Policy Dialogue model that can help explore critical planning questions in water and food.

Future collaboration between IFPRI and IWMI will build on the work presented here to further enhance policymakers' understanding of critical water and food issues for the future. In January 2002 the two institutes joined forces on a program to model and analyze water resources and food policy at the river basin, country, regional, and global levels. Ultimately this program will also analyze the effects of climate change on water and agriculture over longer time periods; develop investment and cost functions for water storage, new irrigation infrastructure, and efficiency

improvements in existing water and irrigation systems; and offer more detailed assessments of the effects of water quality and pollution.

This work should further clarify the policy choices laid out in this book. Although there is still much to learn about the future water situation, we already know for certain that if we are to avoid a devastating water crisis, policy and management reforms are needed now.

To share the key findings from this important research with a wider audience, we are publishing a more popular version of this book as a food policy report titled *Global Water Outlook to 2025: Averting an Impending Crisis*.

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Acronyms

BE	Basin (water use) efficiency (the ratio of beneficial consumption over total consumption)
CRWR	Center for Research in Water Resources
CRU	Climate Research Unit of the University of East Anglia, England
DC	Consumption coefficient (the ratio of water consumption over water withdrawal)
FAO	Food and Agriculture Organization of the United Nations
EWIR	Effective water supply for irrigation
ECOSOC	Economic and Social Council of the United Nations
GCM	Global climate models
GIS	Geographic Information Systems
GDP	Gross domestic product
GMAWW	Groundwater maximum allowable water withdrawal
GNP	Gross national product
GPS	Global positioning systems
IWMI	International Water Management Institute
IWSR	Irrigation water supply reliability index
LA	Latin America
M&I	Municipal and industrial
MCM	Million cubic meters
NGO(s)	Nongovernmental organization(s)
NIWSR	Non-irrigation water supply reliability
OECD	Organisation for Economic Co-Operation and Development
O&M	Operations and maintenance
RBOs	River basin organizations
SMAWW	Surface maximum allowable water withdrawal
SPAR	Soil-plant-atmosphere-research
SSA	Sub-Saharan Africa
UFW	Unaccounted-for water
UN	United Nations

UNCED	United Nations Conference on Environment and Development
UNESCO	United Nations Educational Scientific and Cultural Organization
WANA	West Asia and North Africa
WRI	World Resources Institute
WUA(s)	Water user associations
WWV	World Water Vision

Note: See Table 1.1 for scenario abbreviations and descriptions and Boxes 2.1 and 2.2 for water demand and water supply definitions, respectively.