Irrigation And Water Management Food And Agriculture

Innovative approaches to agricultural water use for improving food security in Sub-Saharan Africa

The management of irrigation systems is context-dependent, socially constructed, and technically uncertain. An example of complex social-ecological systems, irrigation deals with both the ecosystem uncertainty and the implementation of new technological systems and water management options. Issues to be addressed by irrigation systems at the global scale include: water productivity and food security, field operation and maintenance, spatial irrigation in climate change scenarios, and vulnerability of environmental resources. This book provides examples of some of the current challenges faced by irrigation systems from technical and social perspectives. The book offers an easy-to-follow format focused on different case studies combining evidence-based solutions for increasing resilience and reducing vulnerability of irrigation systems in semi-arid and arid regions across the world.

Water Management, Food Security and Sustainable Agriculture in Developing Economies

There is increasing recognition of the need to bring about changes across the full spectrum of agricultural practices to ensure that, in future, food production systems are more diverse, sustainable and resilient. In this context, the objectives of irrigation need to be much more ambitious, shifting away from simply maximizing crop yields to maximizing net benefits across a range of uses of irrigation water, including ecosystems and nature-based solutions. One important way to achieve this is by better integrating fisheries into the planning, design, construction, operation and management of irrigation systems. Irrigation – a major contributor to the Green Revolution – has significantly improved agricultural production worldwide, with consequent benefits for food security, livelihoods and poverty alleviation. Today, irrigated agriculture represents about 21 percent of cultivated land, but contributes approximately 40% of the global crop production. Many governments continue to invest in irrigation as a cornerstone of food security and rural development. Investments in irrigation often represent a pragmatic form of adaptation to changing climatic conditions.

Water for Food and Rural Development

This is the eBook version of the printed book. This Element is an excerpt from Out of Water: From Abundance to Scarcity and How to Solve the World's Water Problems (9780131367265) by Colin Chartres and Samyuktha Varma. Available in print and digital formats. Understand the crucial linkages between water, food, and poverty in the developing world. About 70% of the poorest live in rural areas where there is little other than agricultural employment. Farming is one of the most precarious ways to earn a living, however. In Asia, for instance, access to water – even where physical scarcity is not a problem — is often still difficult due to inefficient and inequitable institutions...

Water, Food, and Welfare

Central Asia is vulnerable to water scarcity because it is located in semiarid and arid vegetation zones and large parts of its economy depend on water for irrigation and energy. Climate-change scenarios predict temperature increases and a rising number of extreme weather events, which will exacerbate water shortages in the future. In addition, the population of Central Asia is growing more rapidly than the rate of food production which is resulting in food insecurity in many parts of the region too. This volume reports the deliberations of politicians, scientists and representatives of water management organizations from throughout Central Asia. Their contributions not only highlight areas of concern, but also propose numerous ideas for improving the long-term water- and food security in the region.

Increasing the benefits and sustainability of irrigation through integration of fisheries

Water protection, food production and ecosystem health are worldwide issues. Changes in the global water cycle are affecting human well-being in many places, while widespread land and ecosystem degradation, driven by poor agricultural practices, is seriously limiting food production. Understanding the links between ecosystems, water, and food production is important to the health of all three, and sustainably managing these connections is becoming increasingly necessary. This book shows how sustainable ecosystems, especially agroecosystems, are essential for water management and food production.

Water for Food Security, Nutrition and Social Justice

Agriculture is one of the few industries that has been creating resources conti- ouly from nature. Sustainability of this industry is a crucial issue at now-a-days. A agricultural technologies are important to feed the growing
Successful case studies point to satisfactory understanding of the functioning of ecosystems and importance of multi-stakeholder platforms, well-identified funding schemes, realistic monitoring and evaluation systems and developing guidance. Less successful water management projects tend to suffer from inadequate factual and scientific basis and uncoordinated or insufficient stakeholder involvement and lack of long-term planning.

Experiences and to identify possible causalities among factors that characterize the implementation of NBS. The case studies give a minor role to valuation of ecosystem services, an area for which the literature is still involved may have conflicting interests. Hence, implementation of NBS requires a structured and comprehensive approach that starts with the valuation of the services provided by the ecosystem. The whole set of use and management, however, is not an easy task, since many ecosystems are already severely degraded and exploited beyond their regenerative capacity. Furthermore, expanding irrigation could impact the availability of water for sanitation and hygiene which has a central role in slowing down the spread of the disease. It is, thus, clearer that irrigation development should also comply with the requirement of extended need of water for sanitation and hygiene. Developing multiple water use would certainly allow to fight the pandemic while ensuring the basic need of food security in rural communities. To support the concept of multiple water use, a new initiative called SMART irrigation - SMART WASH is proposed for corporate solutions to enhance irrigation and provide WASH facilities to vulnerable communities, thus, responding to the critical needs in times of pandemic crisis.

The State of the World's Land and Water Resources for Food and Agriculture

Pakistan’s water management is at a critical watershed. The world’s seventh-most populous country faces serious challenges that will require improvements in both the “hardware” and “software” of agricultural water management. Water shortages are growing rapidly as a result of growing demand across all water-using sectors. Rapid population growth, from 175 million people in 2010 to an estimated 236 million by 2030 and 280 million by 2050, and international food price spikes create pressure to increase agricultural production of staples, but demand for cash crops is also growing rapidly, including for cotton, fruit trees, and tobacco, to raise rural incomes and generate rural employment to absorb the relatively young, rapidly growing rural population. Water management is also increasingly affected by climate change - including an increased number of flood and drought events - and growing energy shortages, which affect how water is being sourced and used. Last but not least, Pakistan’s political situation is fragile, which has reduced incentives to invest in enhanced agricultural water (and other) technologies. How Pakistan addresses these challenges will be decisive for its population’s future water and food security, for economic growth, and for environmental sustainability. It will also affect water and food outcomes globally, due to the interconnectedness of global food trade. This book was published as a special issue of Water International.

Development of water management in the Caza of Marjayoun

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Food Security in Africa

This report focuses on reinforcing local and national capacities to cope with water scarcity in an irrigation system. The Caza of Marjayoun in Lebanon is suited to agriculture, yet its deteriorated infrastructure has led to high water losses and poor irrigation efficiency.

Agricultural Water Management

This report contains a collection of papers from a workshop—Strengthening Science-Based Decision Making for Sustainable Management of Scarce Water Resources for Agricultural Production, held in Tunisia. Participants, including scientists, decision makers, representatives of non-profit organizations, and a farmer, came from the United States and several countries in North America and the Middle East. The papers examined constraints to agricultural production as it relates to water scarcity; focusing on 1) the state of the science regarding water management for agricultural purposes in the Middle East and North Africa 2) how science can be applied to better manage existing water supplies to optimize the domestic production of food and fiber. The cross-cutting themes of the workshop were the elements or principles of science-based decision making, the role of the scientific community in ensuring that science is an integral part of the decision making process, and ways to improve communications between scientists and decision makers.


This report first provides an outlook for the agricultural and food market and highlights the challenges that population trends, rising global incomes and climate change present to agriculture and water. The following section focuses on two broad areas that require attention and presents recommendations on: (i) policies within the agricultural domain that apply specifically to the sector such as water supply enhancement, water loss reduction, crop productivity, water re-allocation, and options for rainfed agriculture; and (ii) actions within the water domain that relate to water management for all sectors, not only agriculture.

Food Business and the Global Water Challenge

Bachelor Thesis from the year 2008 in the subject Business economics - Business Ethics, Corporate Ethics, grade: 1.7, University of Hohenheim (Institut für Agrarpolitik und Landwirtschaftliche Marktlehre), course: Management in der Ernährungswirtschaft, language: English, abstract: In many ways water is of vital importance for humanity. But 1.1 billion people in developing countries today have inadequate access to water. While competition for water increases worldwide, agriculture - the major user of water - is challenged to manage water in a more efficient and environmentally sustainable way. Meanwhile, the governance of the global agri-food system is undergoing significant changes, thus altering business relationships. These altered business relationships raise questions about the impact of food business on water resources. The central research question of this paper, applied to food producing countries, is: Does food business satisfy the interests of Environmental Special-Interest Groups and farmers in efficient and environmentally sustainable agricultural water management, as well as the interests in the related arrangements of relationships? Drawing on stakeholder theory, the relationships between food business, environmental stakeholders, farmers, and water resources are explored. By transferring the key principles of value creation, dialog, and continuous improvement on food business, critical factors were identified. Value creation, inclusiveness, and accountability are crucial features of relationships with environmental stakeholders, while value creation, fairness, support and compliance are crucial features of relationships with farmers. Two case studies, focusing on Nestlé and GlobalGAP, were undertaken. The study concludes that food business increasingly acknowledges the vital importance of addressing water management in agriculture. The case studies provided a few promising approaches to satisfy the interests of environmental stakeholders and farmers. Further research must be conducted, in order to assess the particular implications for smallholders. In addition, more transparency is generally needed, to make the effective impact of food business on water resources in global agriculture measurable. - Keywords: Water resources, irrigation, food industry, food trade, csr, corporate social responsibility, business ethics, green business, stakeholder dialogue, supply chain, procurement, stakeholder management / Schlagworte: Bewässerung, Nachhaltigkeit, Unternehmensethik, Wirtschaftsethik, Ethik, Verantwortung, Stakeholderdialog, Stakeholderansatz, Stakeholderdialog, A närbeitsgruppen, Lebensmittelindustrie, Nahrungsmittelindustrie, Lebensmittelhandel, Lebensmittelhandel, Handel, Konsumgüter, Supermarkt, Lieferketten, Beschaffung.

Managing Water and Agroecosystems for Food Security

This report derives from the importance of water for irrigation to the question, how will additional food be produced as competition for scarce land and water resources increases? The International Water Management Institute (IWMI), Food and Agricultural Producive Organization of the United Nations (FAO), and International Food Policy Research Institute (IFPRI) provide a partial picture of supply and demand for food supply and irrigation-water by 2025 and 2030. The World Bank initiated a validation exercise in cooperation with these agencies to ensure that the models: consider a balanced range of assumptions and scenarios, introduce additional assumptions and scenarios, and replace, or fine-tune, some of them. It attempts to introduce into the forecasts the possible impacts of additional policy interventions and to evaluate their likely effects on the global projections of agriculture-water supply and demand. The validation exercise provides a review of the existing model structure and components, the assumptions made, the scenarios, and scenario results. Model assumptions, scenarios, and results of the revised response from the IWMI, FAO, and IFPRI are given as a part of the validation exercise as well as assumptions made and scenarios developed under different criteria and issues as raised by the group of experts.

Irrigation

Nothing provided

Full Planet, Empty Plates: The New Geopolitics of Food Scarcity

Prospects for Irrigated Agriculture

Water Quality for Agriculture

This book explores and interrogates the food-water-energy nexus, arguably the most crucial factor in sustaining India’s economic development. The book sheds light on different experiences faced in states across India, including the consequences of electricity tariff reforms and related policies on irrigated agriculture. Part 1 focuses on the historical development of agriculture and social change in India, with special reference to the mode of responses and adaptations in social systems against the inherent low and erratic rainfall and resulting water stress in India during the pre-colonial period. Additionally, it investigates how colonial development destroyed social systems and discusses future development prospects. Part 2 discusses contemporary issues of agriculture and social change in India. A comprehensive examination of various important issues related to South Asian agricultural development in the past and in the present, this book will be a valuable reference for researchers of Asian development, sustainable development, environmental policy, South Asian Studies and Development Studies.

Concerns and Advances of Agricultural Water Management

In a worldwide context of ever-growing competition for water and land, climate change, droughts and man-made water scarcity, and less-participatory water governance, agriculture faces the great challenge of producing enough food for a continually increasing population. In this line, this book provides a broad overview of innovation issues in the complex water-agriculture-food nexus, thus also relative to their interconnections and dependences. Issues refer to different spatial scales, from the field or the farm to the irrigation system or the river basin. Multidisciplinary approaches are used when analyzing the relationships between water, agriculture, and food security. The covered issues are quite diverse and include: innovation in crop evapotranspiration, crop coefficients and modelling; updates in research relative to crop water use and saving; irrigation scheduling and systems design; simulation models to support water and agricultural decisions; issues to cope with water scarcity and climate change; advances in water resource quality and sustainable uses; new tools for mapping and use of remote sensing information; and fostering a participative and inclusive governance of water for food security and population welfare. This book brings together a variety of contributions by leading international experts, professionals, and scholars from various fields. It represents a major synthesis and state-of-the-art on various subjects, thus providing a valuable and updated resource for all researchers, professionals, policymakers, and post-graduate students interested in the complex world of the water-agriculture-food nexus.

Water for sustainable food and agriculture

The author discusses the geopolitics of food security in the face of scarcity caused by falling water tables, soil erosion and global warming and supports his position that “food is the new oil” through an examination of decades of agricultural issues. Simultaneous.

Water and Agriculture

In this book, major issues surrounding importance of water and energy for food security in the United States and India are described representing two extremes in yield, irrigation efficiency, and automation. The farming systems in these two countries face different risks in terms of climatic shifts and systems’ resiliency to handle the shocks. One may have comparative advantage over the other, but both are susceptible. Innovations in irrigation for food and fuel production, improvements in nitrogen and water use efficiency, and rural sociocultural issues are discussed here. We also look into some of the unintended consequences of high productivity agriculture in terms of surface and ground water quality and impacts on ecosystem services. Finally, we present ways to move forward to meet the food demands in the next half-century in both countries. As the current world population of 7 billion is expected to reach or exceed 10 billion in the next 40 years, there will be significant additional demand for food. A rising middle class and its preference for a meat-based diet also increases the demand for animal feed. This additional food and feed production needs special considerations in water and energy management besides the development of appropriate crop hybrids to withstand future climatic shifts and other environmental factors. A resilient agricultural landscapes will also be needed to withstand climatic fluctuations, disease pressures, etc. While the upper and many middle income countries have made significant improvements in crop yield due to pressurized irrigation and automation in farming systems, the lower income countries are struggling with yield enhancements due to such limitations. The rise in population is expected to be more in Sub-Saharan Africa and Middle East (Low to middle-income countries) where the crop yields are expected to be low.

Water, Food, and Poverty

This book addresses the following topics: the contemporary model for water management and alternative approaches; the socioeconomic framework, water policy and institutions; water use for food purposes, water-resources inventory and irrigation; manifestations of welfare loss and water prices; change in dietary patterns and water security; hydrological stress and pressures on water availability; groundwater management problems; vulnerability and climate change; water demand of major crops; gray water footprint and water pollution; gray water footprint and mining; virtual water and food trade; estimates of the water footprint of four key cereals; forage, livestock and bottled drinks. It is the result of a cooperation between 16 researchers from eleven Mexican academic institutions.

Water for Food Water for Life

This book highlights the concerns related to food security and agricultural water management. Food security came up as a problem in the first decade of the 21st century, questioning the sustainability of humankind, which is certainly associated directly to the agricultural water management that has varied dimensions and needs integrative expertise in order to be dealt with. The aim of this book is to integrate the subject matter that deals with sustainable irrigation management development and strategies for irrigation water supply conservation in a single text. It is a comprehensive compilation of information regarding content revealing situations from distinct continents. Several case studies have been elucidated in this book to provide the readers with a general scenario of the problem, challenges and perspective of irrigation water use. The book serves as a descriptive reference for professionals, students and researchers working on distinct aspects of agricultural water management.
Sustainable Development in India

It is becoming increasingly recognized that for the optimal sustainable development and use of natural resources, an integrated approach to water management, agriculture, food security and energy is required. This "nexus" is now the focus of major attention by researchers, policy-makers and practitioners. In this book, the authors show how these issues are being addressed in India as part of its economic development, and how these can provide lessons for other developing nations. They address the conflicting claims of water resources for irrigation and hydropower, where both are scarce at the national level for fostering water and energy security. They also consider the relationship between water for irrigated agriculture and household use and its impact on rural poverty. They identify weaknesses in the current hydropower development programme in India that are preventing it from being an ecologically sustainable, socially just and economically viable solution to meeting growing energy demand. The empirical analyses presented show the enormous scope for co-management of water, energy, agricultural growth and food security through appropriate technological interventions and market instruments.

Food, Energy, and Water Nexus

This edited volume "Food Security in Africa" is a collection of reviewed and relevant research chapters offering a comprehensive overview of recent developments in the field of food safety and availability, water issues, farming and nutrition. The book comprises single chapters authored by various researchers and edited by an expert active in the public health and food security research area. All chapters are complete in itself but united under a common research study topic. This publication aims at providing a thorough overview of the latest research efforts by international authors on Africa's food security challenges, quality of water, small-scale farming as well as economic and social challenges that this continent is facing. Hopefully, this volume will open new possible research paths for further novel developments.

Tackling change

This book addresses strategies for food security and sustainable agriculture in developing economies. The book focuses primarily on India, a fast developing economy, whose natural resource base comprising land and water supporting agricultural production is not only under enormous stress, but also complex and not amenable to a uniform strategy. It critically reviews issues which continue to dominate the debate on water management for agricultural and food production. The book examines the validity of the claim that large water resources projects cause serious social and environmental damages using global datasets. The authors examine claims that the future of Indian agriculture is in rain-fed farming supported by small water harvesting, yet question whether water-abundant eastern India could become the granary of India, through a groundwater revolution with the right policy inputs. In the process, they look at the less researched aspect of the food security challenge, which is land scarcity in eastern India. The book analyzes the physical, economic and social impacts of large-scale adoption of micro irrigation systems, using a farming system approach for north Gujarat. Through an economic valuation of the multiple use benefits from tank systems in western Orissa, it shows how value of water from large public irrigation systems could be enhanced. The book also looks at the reasons for the limited success in bringing about the much needed institutional reforms in canal irrigation for securing higher productivity and equity using case studies of Gujarat, Madhya Pradesh and Maharashtra. Finally it addresses how other countries in the developing world, particularly Sub-Saharan Africa could learn from Indian experience.

Smart irrigation – Smart wash

At a time of mounting population pressures, environmental declines, and growing demand for water, the Paul H. Nitze School of Advanced International Studies (SAIS) and the Center for Strategic and International Studies (CSIS)—positioned at the nexus of academic study and policy analysis—convened international leaders from government, the private sector, nongovernmental organizations, and academia to share their expertise in water, agriculture, and global development. In the realm of technology and innovation, contributing authors point to drip irrigation, drought-resistant plant breeding, wastewater treatment for irrigation reuse, and satellite-based assessments as promising tools to enhance water efficiency and agricultural production. On the micro level, there is a need to improve the livelihoods of smallholder farmers through small-scale soil and water management practices and entrepreneurial, market-based approaches. Resolving the resource conundrum will require concerted political will and action at all levels. Contributing authors suggest that water should be priced correctly to incentivize efficient use; that the public sector should pursue more multi-stakeholder partnerships; and that development approaches should integrate the complex nexus of food, water, and energy into policymaking and management. Although the challenges are vast, experts agree that it is indeed possible to create a future in which water resources and agriculture represent forces of resilience rather than vulnerability.

Water Management for Sustainable Food Production

Managing water resources is one of the most pressing challenges of our times - fundamental to how we feed 2 billion more people in coming decades, eliminate poverty, and reverse ecosystem degradation. This Comprehensive Assessment of Water Management in Agriculture, involving more than 700 leading specialists, evaluates current thinking on water and its interplay with agriculture to help chart the way forward. It offers actions for water management and water policy - to ensure more equitable and effective use. This assessment describes key water-food-environment trends that influence our lives today and uses scenarios to explore the consequences of a range of potential investments. It aims to inform investors and policymakers about water and food choices in light of such crucial influences as poverty, ecosystems, governance, and productivity. It covers rainfall agriculture, irrigation, groundwater, marginal-quality water, fisheries, livestock, rice, land, and river basins. Ampie tables, graphs, and references make this an invaluable work for practitioners, academics, researchers, and policymakers in water management, agriculture, conservation, and development. Published with IWMI.

Policy guide to improve water productivity in small-scale agriculture

Water Productivity and Food Security: Global Trends and Regional Patterns, Volume Three reviews the need for water productivity improvements in agriculture, addressing three distinct questions pertaining to agricultural water productivity improvement in developing countries, including what are the regions where water is a limiting factor, asking what are the technological measures in irrigation that can raise agricultural water productivity and result in water saving at various scales, and what opportunities exist in the developing economies of South Asia and Africa for raising water productivity and improving water economy at basin scale. This book provides a framework to characterize river basins based on water availability, water supplies, water uses and water demands to ascertain the need and measures available for improving crop water productivity that would be effective at various scales, i.e., plant-level, plot-level, irrigation system level and basin level. This is an essential reference for anyone interested in water management and agriculture. Presents clear explanations of the physical and technical measures that can be adopted to improve productivity of water in agricultural production under different basins conditions. Offers physical strategies for improving water productivity in agriculture in different agroecological regions, along with the institutional and policy measures that affect them includes methodologies for assessing the food security challenges of individual nations using empirical analysis and global datasets.
Nature-Based Solutions for agricultural water management and food security

In developing countries, further progress of irrigation is essential for increasing food security and farmers’ income. However, developing small-scale schemes remains a challenge due to multiple factors that must be taken into consideration, such as diversity of small-scale schemes, a large number of water users, social disharmony over the water use, varying water demands of multi-cropping systems, heterogeneity of equipment over the scheme. Furthermore, on-farm irrigation development has a major role in enhancing A gricultural Water Management (AWM). The previous development methods considered the improvement of single-factor productivity, but agriculture is undergoing a global shift from the single objective of outputs (such as yield or net income) to multiple objectives of increasing outputs while conserving natural resources. Many pathways towards enhancement of Water Productivity (WP) are directly related to improving overall farm agronomic management (irrigation, fertilization, plant density, plant protection, etc.), while external measures must be applied to ensure sustainability of introduced good practices (lack of input markets, scarce knowledge, poor infrastructures, water regulations, etc.). Thus introducing irrigation practices to farmers must undergo a step-wise process to ensure that costs do not outweigh achievable benefits, and both institutional and technical environment are capable to sustain results. This is the case in smallholders’ schemes, where farmers are poorly resourced. In order to address these issues, the current policy guide presents a combined methodology, which involves practical experiences drawn from FAO work in the three countries as well as researchers’ results to line up a set of feasible measures to improving WP.

Fundamentals of Irrigation and On-farm Water Management: Volume 1

The paper reviews the existing methods used in India for estimation of flow characteristics at ungauged sites. It focuses on low and high flows, long-term mean flow and flow duration curves. Since it lists the actual formulae, it can be used as a quick reference guide for selecting a suitable technique for various geographical regional and/or river basins in India.

World Water and Food to 2025

A thirsty world; Alternatives for water; Consequences of key policy changes; Implications for the future.

Water and Food Security in Central Asia

This book is the first comprehensive effort to bring together Water, Food Security and Nutrition (FSN) in a way that goes beyond the traditional focus on irrigated agriculture. Apart from looking at the role of water and sanitation for human well-being, it proposes alternative and more locally appropriate ways to address complex water management and governance challenges from the local to global levels against a backdrop of growing uncertainties. The authors challenge mainstream supply-oriented and neo-Malthusian visions that argue for the need to increase the land area under irrigation in order to feed the world’s growing population. Instead, they argue for a reframing of the debate concerning production processes, waste, food consumption and dietary patterns whilst proposing alternative strategies to improve water and land productivity, putting the interests of marginalized and disenchanted groups upfront. The book highlights how accessing water for FSN can be challenging for small-holders, vulnerable and marginalized women and men, and how water allocation systems and reform processes can negatively affect local people’s informal rights. The book argues for the need to improve policy coherence across water, land and food and is original in making a case for strengthening the relationship between the human rights to water and food, especially for marginalized women and men. It will be of great interest to practitioners, students and researchers working on water and food issues.

Water for Food Security

The State of the World’s Land and Water Resources for Food and Agriculture is FAO’s first flagship publication on the global status of land and water resources. It is an advocacy report, to be published every three to five years, and targeted at senior-level decision makers in agriculture as well as in other sectors. SOLAW is aimed at sensitizing its target audience on the status of land resources at global and regional levels and FAO’s viewpoint on appropriate recommendations for policy formulation. SOLAW focuses on these key dimensions of analysis: (i) quantity, quality of land and water resources, (ii) the rate of use and sustainable management of these resources in the context of relevant socio-economic driving factors and concerns, including food security and poverty, and climate change. This is the first time that a global, baseline status report on land and water resources has been made. It is based on several global spatial databases (e.g., land suitability for agriculture, land use and management, land and water degradation and depletion) for which FAO is the world-recognized data source. Typical and emerging issues on land and water are dealt with in an integrated rather than sectoral manner. The implications of the status and trends are used to advocate remedial interventions which are tailored to major farming systems within different geographic regions.

Innovation Issues in Water, Agriculture and Food

The concept of integrated water resources management has rapidly gained widespread currency. As attempts to formulate a global vision for water are on the increase, it is important to clarify this concept so that it does not degenerate into an empty slogan. This important volume of 17 original essays, establishes the crucial relationship between the multiple uses of water resources on the one hand and food security and rural development on the other, and suggests innovative approaches and methodologies that can help resolve the deadlock in water resources development and management.

Water Productivity and Food Security

This paper provides an overview of innovative options for developing and using water for food production in sub-Saharan Africa (SSA) in light of the growing scarcity and competition for water resources. These options include rainwater harvesting, selective development of wetlands for agriculture, exploitation of shallow groundwater, and recycling urban waste. The options are largely based on low-cost individualized technologies, which lend themselves to private-sector promotion. Water-demand management approaches are also discussed.

The Water, Energy and Food Security Nexus

Water Productivity and Food Security: Global Trends and Regional Patterns, Volume Three reviews the need for water productivity improvements in agriculture, addressing three distinct questions pertaining to agricultural
water productivity improvement in developing countries, including what are the regions where water is a limiting factor for raising agricultural outputs and water productivity improvements, what are the technological measures in irrigation that can raise agricultural water productivity and result in water saving at various scales, and what opportunities exist in the developing economies of South Asia and Africa for raising water productivity and improving water economy at basin scale. This book provides a framework to characterize river basins based on water availability, water supplies, water uses and water demands to ascertain the need and measures available for improving crop water productivity that would be effective at various scales, i.e., plant-level, plot-level, irrigation system level and basin level. This is an essential reference for anyone interested in water management and agriculture. Presents clear explanations of the physical and technical measures that can be adopted to improve productivity of water in agricultural production under different basin conditions Offers physical strategies for improving water productivity in agriculture in different agroecological regions, along with the institutional and policy measures that affect them Includes methodologies for assessing the food security challenges of individual nations using empirical analysis and global datasets.