

# Water and Energy Reader

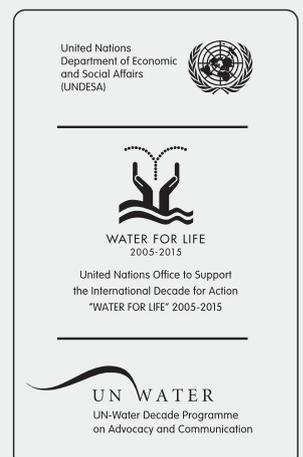
## UN-Water Decade Programme on Advocacy and Communication (UNW-DPAC)

Produced by the UN-Water Decade Programme on Advocacy and Communication (UNW-DPAC), this reader is intended for all those interested in getting familiar with issues related to water and energy. The reader provides basic references for easy reading and some of the latest and most relevant United Nations publications on the issue. Links are provided when the publication is available online.

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United Nations Office to Support  
the International Decade for Action  
'Water for Life' 2005-2015

[www.un.org/waterforlifedecade](http://www.un.org/waterforlifedecade)



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## An overview

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### ■ **Thinking about Water Differently: Managing the Water–Food–Energy Nexus**

Asian Development Bank. September 2013

<http://bit.ly/19AjSzQ>

This publication is the result of a scoping study initiated by the Asian Development Bank to better understand the issues associated with the water-food-energy nexus in Asia and the Pacific. While the report talks about water for energy (in page 12), where it focuses on expanding energy production capacity (keeping low carbon growth in perspective) thereby requiring greater access to freshwater, it also focuses on energy for water and wastewater (page 15).

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### ■ **Thirsty Energy**

World Bank Water Partnership Program (WPP). June 2013

<http://bit.ly/1eWni2U>

This report stresses on the importance of optimizing the use of water and energy. It highlights high risks of the energy sector, the importance of including water in its strategic plan and the development of energy and water relationships. Section one examines the existing models, literature, and management frameworks on the water-energy nexus, as it seeks to determine what gaps exist. Section two describes the water demands of power generation in order to identify potential areas of future uncertainty and delineate areas where integrated energy-water management may improve the reliability of operating power plants and the viability of schemes. Finally, section three describes possible solutions that may alleviate challenges resulting from the link between energy and water by improving energy efficiency and integrating water resources management into energy planning.

### ■ **United Nations World Water Development Report 4. Volume 1: Managing Water under Uncertainty and Risk**

United Nations Educational, Scientific and Cultural Organization (UNESCO), United Nations World Water Assessment Programme (WWAP), UN-Water. March 2012

<http://bit.ly/1ePolwc>

The World Water Development Report 4 gives an overall picture of the state of the world's freshwater resources and analyses pressures from decisions that drive demand for water and affect its availability. Volume 1 focuses on status, trends, challenges and the issue of managing water under uncertainty and risk. It presents an overview of the Water-Energy Nexus with Chapter 1 and Chapter 2 stressing on the importance of energy and water and their interdependence. A detailed analysis of water for energy and energy for water can be seen in Page 52 and 57 respectively.

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### ■ **The Dynamics of Global Water Futures Driving Forces 2011–2050**

United Nations Educational, Scientific and Cultural Organization (UNESCO), United Nations World Water Assessment Programme (WWAP). 2012

<http://bit.ly/1gfEILL>

This document presents a summary of an analysis of the evolution of 10 major external forces ('drivers') that have direct and indirect consequences for water managers. Energy and water issues are addressed all along the report, specially under the driver "Technology".

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### ■ **Status Report on the application of integrated approaches to water resources management 2012**

United Nations Environment Programme (UNEP), UN-Water. 2012

<http://bit.ly/HVnK3X>

Based on a global survey assessing the progress and outcomes of the application of integrated approaches to the development, management and use of

water resources, this UN-Water report includes lessons learned and recommendations, as well as focus areas for action. The report attempts to outline the issues that need to be addressed with key focus areas for action like 'Investment Plans and Programs' and 'Issues for water development and use' in Page 40 and Page 52 respectively. The interdependence of water and energy is explained in page 65 along with some useful graphs.

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■ **Towards a Green Economy: Pathways to Sustainable Development and Poverty Eradication. Chapter 3 on 'Water. Investing in natural capital'**

United Nations Environment Programme (UNEP). December 2011

<http://bit.ly/19AkbdX>

This report is aimed at providing practical guidance to policy makers on what reforms are needed to unlock the productive and employment potential of a green economy. Chapter 3 "Water: investing in natural capital" has three broad aims. First, it highlights the importance of providing all households with sufficient and affordable access to clean water supplies as well as adequate sanitation. Second, it makes a case for early investment in water management and infrastructure, including ecological infrastructure. Third, the chapter provides guidance on the suite of governance arrangements and policy reforms, which, if implemented, can sustain and increase the benefits associated with making such a transition. Section 2.3 addresses the water and energy issue.

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■ **United Nations World Water Development Report 3. Part 2, Chapter 7 "Evolution of water use"**

United Nations Educational, Scientific and Cultural Organization (UNESCO), United Nations World Water Assessment Programme (WWAP), UN-Water. March 2009

<http://bit.ly/19VKPy0>

Chapter 7 of WWDR3 focuses on water use. A sub-section of this chapter deals

with water for industry and energy and summarizes issues such as the energy requirements of the water sector, water use for energy production and current, projected trends in hydropower, and oil prices and energy choices.

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■ **United Nations World Water Development Report 2. Chapter 9 "Water and Energy"**

United Nations Educational, Scientific and Cultural Organization (UNESCO), United Nations World Water Assessment Programme (WWAP), UN-Water. March 2006

<http://bit.ly/1f18YJs>

Chapter 9 of WWDR2 focuses on "Water and energy" issues. Part 1 "Energy for water supply" sets out to show how the two issues are interlinked, focusing upon urban water supply, and how the two systems should be co-managed, with future implications for both water and energy policies. Part 2 focuses on water for energy generation; and Part 3 on governance of energy and water resources.

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## Water and energy security

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■ **(The) Global Water Crisis: Addressing an Urgent Security Issue. Papers for the InterAction Council, 2011-2012**

United Nations University Institute for Water, Environment and Health (UNU-INWEH). September 2012

<http://bit.ly/HsRRZC>

With views from water experts around the globe and members of the InterAction Council, this volume addresses the emerging challenges ahead for addressing the global water crisis and contributes informed perspectives to the emerging global dialogue on achieving water security and reliability. Chapter 1.2 addresses the issue 'Water Impacts on Energy Security and Reliability'.

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## Water-Energy Nexus

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### ■ **An Innovative Accounting Framework for the Food-Energy-Water Nexus. Application of the MuSIASEM approach to three case studies**

Food and Agriculture Organization of the United Nations (FAO). October 2013

<http://bit.ly/17sNZ7G>

This report presents the results of the application of an integrated analysis approach, the Multi-Scale Integrated Assessment of Society and Ecosystem Metabolism (MuSIASEM), to three case studies: (i) An analysis of the option to produce biofuel from sugarcane in the Republic of Mauritius; (ii) An exploration of the future of grain production in the Indian state of Punjab; (iii) An assessment of two alternative energy sources to produce electricity in the Republic of South Africa. The report provides a summary of the final results and is organized in three sections: chapter 1 provides a general description of the multi-scale integrated assessment of society and ecosystem metabolism applied to the food-energy-water nexus-assessment; chapter 2 illustrates the application of the developed approach to the three case studies; and chapter 3 summarizes lessons learned in terms of strength and weakness of the proposed tool.

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### ■ **Implications of biofuel development for water management and use**

United Nations Economic Commission for Latin America and the Caribbean (ECLAC). 2011

*Available in Spanish*

<http://bit.ly/1bxhOoA>

*Conclusions and recommendations (in English, circular 38):* <http://bit.ly/18TRGcL>

This report analyzes the impact of increasing biofuel production on the quantity and quality of water available for other uses and points to tools and strategies that can reduce potential negative effects. It introduces readers to

biofuels and the current status of their development; identifies the main impacts of biofuel production on water quantity and quality; shows different legislative strategies for dealing with these effects; analyzes legislation on water and biofuels; and concludes with the tools and strategies to deal with the impacts identified throughout the report.

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### ■ **The Bioenergy and Water Nexus**

United Nations Environment Programme (UNEP). 2011

<http://bit.ly/17XV4R7>

This report draws attention to the nexus of Bioenergy and Water. With their inextricable link, the report answers to the concern related to the influence of bioenergy on the future state of water resources. The literature also identifies the emerging issue in this sector related to water quality and quantity which has the capacity to impact on the contribution of Bioenergy on the overall energy mix. The report includes a number of indicators and assessment tools to include the water perspective in analyses and to assist strategy development and land use planning.

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## Water and energy use efficiency

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### ■ **Primer on Energy Efficiency for Municipal Water and Wastewater Utilities**

International Bank for Reconstruction and Development (IBRD), World Bank. February 2012

<http://bit.ly/1a8v1HB>

This primer focuses on energy use pattern and the efficiency of network-based water supply and wastewater treatment in urban areas. It majorly focuses on the supply side of the municipal water cycle which comprises of water extraction, treatment, distribution, collection and wastewater treatment activities.

■ **Industrial Development Report 2011: Industrial energy efficiency for sustainable wealth creation**

United Nations Industrial Development Organization (UNIDO). 2012

<http://bit.ly/1as6H2P>

The Industrial Development Report 2011 (IDR) stresses on capturing environmental, economic and social dividends and addresses the role of industrial energy efficiency in correlation with water use and pollution, water linkages to energy efficiency, etc. which are intrinsically linked to manufacturing. Other water-related challenges are also addressed by the report in Section 2, Chapter 3.

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## Hydropower

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■ **Report by the Special Rapporteur on the rights of indigenous peoples**

**Ethiopia: Situation of the Gilgel Gibe III hydroelectric project on the Omo River**

United Nations Special Rapporteur on the rights of indigenous peoples. August 2011

<http://bit.ly/19zy2hc>

In this addendum to his Report, the Rapporteur submits to the Human Rights Council specific cases he has examined concerning alleged violations of the human rights of indigenous peoples in many parts of the world. It includes a case on the situation of the Gilgel Gibe III hydroelectric project on the Omo River in Ethiopia.

■ **Report of the Special Rapporteur on the rights of indigenous peoples, James Anaya. The situation of the indigenous peoples affected by the El Diquís hydroelectric project in Costa Rica**

United Nations Special Rapporteur on the rights of indigenous peoples. July 2011

<http://bit.ly/1djSQh6>

In this note, the Special Rapporteur on the rights of indigenous peoples, James Anaya, submits a series of observations and recommendations on the situation of

the indigenous people affected by the El Diquís hydroelectric project in Costa Rica.

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■ **Rehabilitation of hydropower. An introduction to economic and technical issues**

The World Bank. 2011

<http://bit.ly/1iWWxvA>

The paper takes two distinct markets for rehabilitation of hydropower for analysis, namely Continental Africa (including Madagascar) and Central America (including Mexico). The importance of enhancement of water management system gets a special mention. Water being a fuel for hydropower plants, difficulties arising due to climate change which produces stress on water infrastructure is highlighted as challenges thereby making hydrology unpredictable. Analyses on 9 different cases have been presented here with lessons learned from each of them on successful execution of hydropower rehabilitation process.

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■ **Report by the Special Rapporteur on the situation of human rights and fundamental freedoms of indigenous people**

United Nations Special Rapporteur on the rights of indigenous peoples. September 2010

<http://bit.ly/19Wb9rW>

This report presents a series of cases examined by the Special Rapporteur from June 2009 to July 2010. Among the cases analysed it includes one related to the construction of a hydroelectric dam in Belo Monte, Brazil.

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■ **Dams and Development. Relevant practices for improved decision-making. A compendium of relevant practices for improved decision-making on dams and their alternatives**

United Nations Environment Programme (UNEP). 2007

<http://bit.ly/1d3ut3F>

This publication is a contribution by the Dams and Development Project (DDP) in support of the efforts of countries and the international community directed towards

achieving internationally agreed development goals for reducing poverty through environmentally and socially sustainable development of water and energy resources. The Compendium is intended to inform policy makers, managers and practitioners about what people are actually doing in this area, presenting real-life examples of good (and not so good) practice to inspire them to do things better in crafting local solutions.

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## By region

### Africa

- **Water for agriculture and energy in Africa. The challenges of climate change. Report of the ministerial conference**

Food and Agriculture Organization of the United Nations (FAO). 2011

<http://bit.ly/19fk3Cv>

This report presents main conclusions from the Ministerial Conference on Water for Agriculture and Energy in Africa: the Challenges of Climate Change, which was held in Sirte, Libyan Arab Jamahiriya, from 15 to 17 December 2008.

### Asia and the Pacific

- **Partnerships for Universal Access to Modern Energy Services. A global assessment report on public-private renewable energy partnerships**

United Nations. December 2013

<http://bit.ly/19fapA2>

“Enhancing energy security and improved access to energy services through development of Public-Private Renewable Energy Partnerships” is a joint effort among the five United Nations Regional Commissions: UNECA, ECLAC, UNECE, UNESCAP and UNESCWA. One of the activities to be implemented under the project is to conduct regional assessments of the energy situation in each of the five regions. This report offers the assessment

of the current situation of energy services in West Asia with a focus on renewable energy resources and public-private partnerships.

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- **Water, Food and Energy Nexus in Asia and the Pacific. Discussion paper**

United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP). August 2013

<http://bit.ly/1cYfvSp>

This report traces the debate, analysis and action on the water, food and energy (WFE) security nexus. It reviews the region’s experiences with the interlocking effects of the WFE nexus, which results in challenges that cross two or even all three of the domains. Examples include biofuel; hydropower; thermoelectric production and water security; irrigation and food security; irrigation and energy security; food trade and virtual water, land and food security; and the intertwining effect of water production and energy security. The meaning of the nexus is further explored by using two case studies, namely Central Asia and the Mekong Basin. The concluding section outlines five key areas of policy interventions needed to mainstream the nexus concept in Asia and the Pacific region.

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- **Green Growth, Resources and Resilience: Environmental Sustainability in Asia and the Pacific**

Asian Development Bank (ADB), United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP), United Nations Environment Programme (UNEP). February 2012

<http://bit.ly/18KB1X0>

This report provides new insights into Asian and Pacific resource use trends in an ever increasing energy demand society and outlines key actions, including reforming economic incentives and promoting more inclusive and adaptive governance approaches, that governments can pursue to help bring economic growth strategies in closer alignment with the objective of sustainable development. It highlights the

neat blend of energy and water in every fundamental issue. The energy security is backed by importance of water availability and management. It also identifies opportunities in the current scheme of things in section 'Green shoots – new opportunities and challenges'

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#### ■ **Promoting Beneficial Sewage Sludge Utilization in the People's Republic of China**

Asian Development Bank (ADB). April 2012

<http://bit.ly/1bSvkX4>

This report examines best international practices in sludge management, analyzes the current situation in the People's Republic of China (PRC) relative to this best practice, and suggests a pathway for the PRC to modernize its approach to sludge management. In particular, it highlights the trend towards viewing sludge as a resource with opportunities for beneficial use that result in considerable environmental and energy-saving benefits.

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#### ■ **Environment and Security in the Amu Darya Basin Environment and Security Initiative (ENVSEC)**

United Nations Environment Programme (UNEP). July 2011

<http://bit.ly/19UZwOf>

The prime aim of this report is to identify the environmental stress points in the Amu Darya basin which have, or may have, security repercussions for the States and population. The reports takes a close focus on issues of climate change, water, energy and agriculture in the Amu Darya basin, and reveals that it is vital to maintain cooperation in these fields, since neglect for these important areas means intensified security risk. The report then suggests solutions to the challenges identified during the assessment. The assessment report is based on a process comprising missions and consultations with State authorities, representatives of the media and civil society in Afghanistan, Tajikistan, Turkmenistan and Uzbekistan in 2007-2010.

#### ■ **Strengthening Cooperation for Rational and Efficient Use of Water and Energy Resources in Central Asia**

United Nations Economic Commission for Europe (UNECE), United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP). 2004

<http://bit.ly/1cdH6Oh>

This document contains a strategy for intraregional cooperation and two comprehensive background documents which address major issues facing the Central Asian countries in the water and energy sectors and assess the potential for the region's energy and water resources development. The studies also provide a basis for the formulation of a strategy for cooperation in promoting the rational and efficient use of energy and water resources in Central Asia. The strategy outlines the broad prospects for collective actions to secure a sustainable future for energy and water resources development in the region.

# International Decade for Action 'Water for Life' 2005-2015

## A Decade for Water, a Decade for Life

Towards the primary goal of the Water for Life Decade, Spain has agreed to provide resources to the United Nations to establish an Office to support the International Decade for Action. Located in Zaragoza, Spain, and led by the United Nations Department of Economic and Social Affairs (UNDESA), the Office implements the UN-Water Decade Programme on Advocacy and Communication (UNW-DPAC) aiming at sustaining the global attention and political momentum in favour of the water and sanitation agenda at all levels during the Decade.

The views expressed in this publication do not necessarily reflect the views of the United Nations Secretariat or the United Nations Office to Support the International Decade for Action (UNO-IDfA) 'Water for Life' 2005-2015.

The designations employed in this publication and the presentation of the material do not imply the expression of any opinion whatsoever on the part of the Secretariat of the United Nations or the UNO-IDfA 'Water for Life' 2005-2015 concerning the legal status of any country, territory, city or area, or of its authorities, or concerning the delimitation of its frontiers or boundaries.

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