

Appendix 1

World Water Development Report indicators

Author: Mike Muller

Even as we pay more attention to the current state, uses and impacts of water resources and identify the challenges that the global community faces in managing them, the flow of information to support this work is drying up rather than growing.

The first edition of *The United Nations World Water Development Report*, published in 2003, included an extensive compilation of information, drawn from multiple sources, documenting the state of water, the resource and its uses. Many agencies and individuals opened their formal and informal archives to share information from their knowledge bases. These enthusiastic contributions established an important baseline from which to move forward.

In all, more than 160 indicators were reported on, ranging from the global quantum of water available and withdrawals for human use to compliance with water quality standards for key pollutants and governance mechanisms to support water management.

The first report also explicitly recognized the need for further work, notably in collecting biogeophysical and socioeconomic data as well as data on environmental protection and investment in water. It highlighted the danger of data availability driving the selection of indicators, which results in a 'data-rich, but information-poor' syndrome, in which plenty of data are produced but they are not tailored to information needs

The second edition of *The United Nations World Water Development Report* discussed the consequences of poor data availability:

Data on almost every subject related to water issues is usually lacking, unreliable, incomplete or inconsistent. We have learned that merely collecting data is not enough. It must be brought together, analysed and converted into information and knowledge, then shared widely within and between countries and stakeholders to focus attention on water problems at all scales. It is only when the data has been collected and analysed that we can properly understand the many systems that affect water (hydrological, socio-economic, financial, institutional and political alike), which have to be factored into water governance.

The number of indicators presented in the second edition of the report declined to 62 because there was no systematic process for updating the data used for most of the indicators presented in the first report. Water supply and sanitation has been an exception: the World Health Organization and United Nations Children's Fund Joint Monitoring Programme has systematically addressed the challenge, investing to ensure a regular flow of updated information on this subsector.

Three years later the production team for the third *United Nations World Water Development Report* is in a similar situation to its predecessors. During preparations for the

Mike Muller is co-chair, World Water Assessment Programme Expert Group on Indicators, Monitoring and Data/Metadata Bases.



report, a survey of data providers suggested that new data would be available for only some of the indicators used in the second report. At press time 30 indicators had been updated. Because some indicators included in the second report were identified as not useful by the source agency, 58 indicators are now listed in table A1.1. The profile sheets describing these indicators are available on the World Water Assessment Programme Website (www.unesco.org/water/wwap/).

While the indicators on the water resources situation in the first *United Nations World Water Development Report* provided policy-makers at the national, regional and global levels with a critical overview of the situation, insight into the trends of key indicators is vital in a rapidly changing world.

In most cases it has not proved possible to provide this insight. No new global estimates of available water resources or of volume abstracted by major sectoral users are available. So while this third edition of the report again contains much important information, it remains impossible to provide information on the evolution of key indicators. (One notable exception is a new indicator, Status of progression on Agenda 21, which has been updated and included in this report.)

Several actions are planned to address this gap: UN-Water has created the Task Force on Indicators, Monitoring and Reporting to address the challenge of producing key global indicators of the state of water resources to meet the needs of policy- and decision-makers at all levels. And the World Water Assessment Programme has established the Expert Group on Indicators, Monitoring and Data/Metadata Bases to support this work, specifically by promoting a dialogue between indicator users and data providers/interpreters about the feasibility of providing data for the key indicators on a sustainable, ongoing basis. The expert group will also propose strategies to improve data collection and interpretation.

It is hoped that the next *United Nations World Water Development Report* will be able to report some substantive progress and answer key questions about whether and how changing water resources endowments affect countries and regions, whether the efficiency of water use for national socioeconomic development is improving and whether degradation of the water environment has been slowed. At the very least, it should be able to report on steps taken to improve the flow of data and information needed to establish and monitor key trends.

Table A1.1 List of United Nations World Water Development Report indicators and location of detailed data

Topic	Indicator	Category in cause-effect approach ^a	Type of indicator ^b	Location ^c	
				In World Water Development Report 2	In World Water Development Report 3
Level of stress on the resource	Index of non-sustainable water use	Driving force, Pressure, state	Key	Section 1	na
	Rural and urban population	Pressure, state	Basic	Section 1	Map 2.1 Figure 2.1
	Relative Water Stress Index	Pressure, state	Key	Section 2	na
	Sources of contemporary nitrogen loading	Pressure, state	Key	Section 3	na
	Domestic and industrial water use	Pressure, state	Basic	Section 3	Table 7.1 Figure 7.1
	Impact of sediment trapping by large dams and reservoirs	Pressure	Key	Section 4	na
	Coefficient of variation for the Climate Moisture Index	State	Key	Section 4	na
	Water Reuse Index	Pressure, state	Key	Section 4	Figure 8.6
Governance	Access to information, participation and justice	Response	Developing	Table 2.2 Table 2.3	na
	Assessing progress towards achieving the integrated water resources management target	Response	Key	Table 2.1	na

(continued)



Appendix 1

Table A1.1 List of United Nations World Water Development Report indicators and location of detailed data (continued)

Topic	Indicator	Category in cause-effect approach ^a	Type of indicator ^b	Location ^c	
				In World Water Development Report 2	In World Water Development Report 3
Settlements	Index of performance of water utilities	State	Developing	na	na
	Urban water and sanitation governance index	State	Developing	na	na
	Slum profile in human settlements	Pressure	Developing	na	na
State of the resource	Total actual renewable water resources	State	Key	Table 4.3	*
	Precipitation	Driving force	Basic	Table 4.3	Table 10.1 Map 11.1 **
	Total actual renewable water resources per capita	State	Developing	Table 4.3	**
	Surface water as share of total actual renewable water resources	State	Developing	Table 4.3	na
	Overlap as share of total actual renewable water resources	State	Developing	Table 4.3	na
	Inflow from other countries as share of total actual renewable water resources ^d	State	Developing	Table 4.3	**
	Outflow to other countries as share of total actual renewable water resources	State	Developing	Table 4.3	na
	Total use as share of total actual renewable water resources ^e	State	Developing	Table 4.3	**
Ecosystems	Groundwater development as share of total actual renewable water resources	State	Key	Table 4.3	na
	Fragmentation and flow regulation of rivers	State, impact	Key	Map 5.3 Figure 5.4	Figure 8.2
	Dissolved nitrogen (nitrates + nitrogen dioxide)	State	Key	Map 5.2	*
	Trends in freshwater habitat protection	State, response	Key	Fig. 5.7	na
Health	Freshwater species population trends index	State	Key	Fig. 5.2	Figure 8.1
	Disability-adjusted life year	Impact	Key	Table 6.3	Table 6.3
	Prevalence of stunting among children under age 5	Impact	Developing	na	Map 6.2
	Mortality rate of children under age 5	Impact	Developing	Table 6.2	*
	Access to safe drinking water	Impact	Key	Map 6.1	Figure 7.3
Food, agriculture and rural livelihoods	Access to basic sanitation	Impact	Key	Map 6.2	Figure 7.4
	Percentage of undernourished people	State	Key	Map 7.2 Figure 7.10 Figure 7.11	*
	Percentage of poor people living in rural areas	State	Key	na	*
	Agriculture GDP as share of total GDP	State	Key	na	*
	Irrigated land as a percentage of cultivated land	Pressure, state	Key	Map 7.1	Map 7.5
	Agriculture water withdrawals as share of total water withdrawals	Pressure	Key	na	Table 7.1
	Extent of land salinized by irrigation	State	Key	na	na
Groundwater use as share of total irrigation	Pressure, state	Key	na	Figure 7.1	

(continued)



Table A1.1 **List of United Nations World Water Development Report indicators and location of detailed data** (continued)

Topic	Indicator	Category in cause-effect approach ^a	Type of indicator ^b	Location ^c	
				In <i>World Water Development Report 2</i>	In <i>World Water Development Report 3</i>
Industry and energy	Trends in industrial water use	Pressure	Key	Figure 8.1	na
	Water use by major sector	State	Key	Figure 8.3	Table 7.1 Figure 7.1
	Organic pollution emissions (biochemical oxygen demand) by industrial sector	Impact	Key	Figure 8.4	*
	Industrial water productivity	Response	Key	Table 8.4	Figure 7.8
	Trends in ISO 14001 certification	Response	Key	Table 8.2	Figure 8.7
	Electricity generation by energy source	State	Key	Figure 9.1	Figure 7.11
	Total primary energy supply by source	State	Key	Figure 9.2	*
	Carbon intensity of electricity generation	Impact	Key	Table 9.4	na
	Volume of desalinated water produced	Response	Key	Table 9.1	Box 9.5
	Access to electricity and water for domestic use	Pressure	Key	Table 9.5	*
Capability for hydropower generation	State	Key	Table 9.6	Map 7.6 *	
Risk assessment	Disaster Risk Index	State	Key	Box 10.4	na
	Risk and policy assessment indicator	Response	Key	Figure 10.7	na
	Climate Vulnerability Index	State	Key	Map 10.3	na
Valuing and charging for the resource	Water sector share in total public spending	Response	Developing	na	na
	Ratio of actual to desired level of public investment in drinking water supply	Response	Developing	na	na
	Ratio of actual to desired level of public investment in basic sanitation ^f	Response	Developing	na	na
	Rate of cost recovery ^g	Driving force, response	Developing	na	na
	Water charges as percentage of household income ^h	Driving force, response	Developing	Figure 12.5	na
Knowledge base and capacity	Knowledge Index	State	Developing	Map 13.2	*

na designates that the indicator is not used in the report, although for many of these indicators updated information is provided online (see table note).

Note: An Indicator profile sheet with a detailed definition and explanation of how the indicator is computed (as well as data tables for some indicators) is available for most indicators at www.unesco.org/water/wwap/wwdr/wwdr3/indicators. Exceptions are subindicators for 'Total actual renewable water resources'.

*See table accompanying the online Indicator profile sheet.

**See table accompanying the online Indicator profile sheet for Total actual renewable resources.

a. The categories are based on the DPSIR (driving forces, pressures, state, impact, response) framework. For details, see www.unesco.org/water/wwap/wwdr/wwdr1/pdf/chap3.pdf and www.unesco.org/water/wwap/wwdr/wwdr2/pdf/wwdr2_ch_1.pdf (pp. 33-38).

b. Basic indicators provide fundamental information and are well established and widely used; data are generally widely available for all countries. Key indicators are well defined and validated, have global coverage and are linked directly to policy goals. Developing indicators are in a formative stage and may evolve into key indicators following refinement of methodological issues or data development and testing.

c. Because of updates to data and sources, data may not match across reports.

d. Now called 'Dependency ratio'.

e. Now called 'Millennium Development Goal water indicator'.

f. Proposed for *United Nations World Water Development Report 3*.

g. Now called 'Rate of operation and maintenance cost recovery for water supply and sanitation'.

h. Now called 'Water and sanitation charges as percentage of various household income groups'.

Source: Compiled by Engin Koncagül and Akif Altundaş.