



Technical Advisory Paper No. 2

*Goals and Targets for
Global Water Quality Assessment*

UNEP GEMS/Water Programme

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Goals and Targets for Global Water Quality Assessment

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The target audience for this paper is national focal points and partner agencies. Readers are encouraged to send comments, feedback and suggestions to info@gemswater.org.

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PART I: Introduction

2005 marks the 'UN Decade of Action: Water for Life,' a ten-year framework within which the international community has committed to achieving water and sustainability goals and targets. The agenda and priorities contribute to the role that GEMS/Water plays as the water quality assessment resource for the United Nations system. Since GEMS/Water is science-driven, technical issues are central to all activities.

The role of the Technical Advisory Group (TAG) is to convene every two years to examine in detail a wide range of technical aspects of, and projects for, the UN GEMS/Water Programme. The group is composed of members of the GEMS/Water Steering Committee, as well as representatives of other GEMS/Water partners. The TAG is chaired by a senior UNEP official.

The Technical Advisory Papers serve to provide background information as a guide for the discussions of the TAG meetings. The present paper represents the "corporate view" of the TAG on global water quality monitoring, and the most salient issues facing GEMS/Water. It forms the basis for determining partnership activities: on one hand, the most constructive ways in which partner organizations can contribute to the successful implementation of core activities; and, on the other hand, the best ways for meeting partners' data and service needs.

This paper, being developed in that context, is divided into three main parts. Part I outlines the global context in which the Technical Advisory Group works, and its general role. An update of the mandate, overarching goals and activities of GEMS/Water are briefly described.

For each core activity area, there are several emerging issues identified for consideration by the TAG. The intent of Part II is to develop strategic recommendations to take advantage of opportunities, and to mitigate challenges. This section also focuses on key projects in which GEMS/Water is, or should be, actively engaged. The broader international scientific and technical context helps to identify the most constructive ways in which partner organizations can contribute to the successful implementation of the core activities. This paper will be used to guide the technical aspects of GEMS/Water for the next few years.

Many of the questions identified in the first TAG paper of 2003 are still relevant. However, the various responses to them are different but complementary.

Context— Mandate and Goals

At the 23rd Governing Council, February 2005, Decision 23/2: Updated water policy and strategy of the United Nations Environment Programme, strengthened GEMS/Water's mandate as:

10. *Requests* the Executive Director to facilitate the further development of the United Nations Environment Programme Global Environment Monitoring System on Water to ensure:
 - (a) Its continued role as a major global water quality assessment and monitoring programme;
 - (b) Its continued role as the repository for global water-quality data and its growing role in the development of water-quality indicators to support achievement of the water-related goals contained within the Millennium Declaration and the Plan of Implementation of the World Summit on Sustainable Development;
 - (c) Its continued provision of inputs to the World Water Assessment Programme and the World Water Development Report.

GEMS/Water has renewed its participation at the CSD (sessions 12 and 13) as a UNEP contribution to the implementation of the international water and sanitation targets. This activity was reported in the 2004 Sanitation Report of the Secretary-General:

The Global Environment Monitoring System (GEMS)/Water Programme of the United Nations Environment Programme (UNEP), a global water quality monitoring and assessment programme, provides information on the state and trends of global inland water quality. The programme works with more than 100 partner countries and counterpart organizations within and outside the United Nations system to build capacity in developing countries for collecting and managing information on water quality. GEMS/Water has recently broadened the scope of its datasets to cover parameters related to wastewater and sanitation, including metals, persistent organic pollutants, water-borne pathogens and micropollutants.¹

Building on this general role, the Strategic Business Plan 2002-2007 for GEMS/Water describes the work plan, timeline and budget for producing a series of outputs designed to help the programme successfully achieve its mandate. The rationale behind the Plan is that reliable, consistent and appropriate information is the key to understanding and improving the world's supply and quality of inland water. All operational activities and results have been organized into four core areas:

Four Core Activities and Results
1. Global Water Quality Assessments
2. Global Water Quality Data
3. Data Integrity (QA/QC)
4. Building Water Quality Monitoring Capacity

In view of the need for better integration of activities and key results, a fifth activity has been added as a cross-cutting measure to enable effectiveness and sustainability. The fifth activity should help the other core activities become more results-oriented. These have been integrated into DEWA's programme of work for 2006-2007 as below:

1. Water Quality Assessments, Advocacy

Enhanced awareness of, and cooperation on, water quality, and water quality monitoring, problems and emerging issues, among governments and the public, to better support sustainability

2. Water Quality Data, Indicators

Development and maintenance of global water quality data and information systems to improve accessibility to credible and comparable data; and contribution to the development and use of indicators for better understanding and decision-making of inland aquatic environmental issues, and in support of MDG/WSSD targets

3. Data Integrity, incl. Technical Tools, QA/QC, Alternate Technology

Increased reputation as a credible and reliable source for global water quality data and information, to add value to local-level data collection, and appropriate monitoring and observation technology

4. Capacity Building, Regional Development

Increased participation or involvement in water quality monitoring, assessment and reporting in developing countries and countries with economies in transition to better achieve MDG/WSSD targets

5. Organizational Performance Cross-cutting Function

¹ E/CN.17/2004/5 Sanitation Progress in meeting the goals, targets and commitments of Agenda 21, the Programme for the Further Implementation of Agenda 21 and the Johannesburg Plan of Implementation. Report of the Secretary-General, section C. Monitoring water quality and sanitation, paragraph 45.

Improved internal calibre of the Programme to deliver results 1. to 4. and products, by strengthening human, financial and information management; and by institution building.

Many new and important issues have been identified as impacting or influencing the implementation of the four core activities and cross-cutting function.

Part II: Emerging Issues and Recommended Actions

1.0 Global Water Quality Assessments

“The Millennium Development Goals are not limited to water scarcity and access. Water quality is an important determinant of availability. Water which is not fit for a particular use is effectively unavailable.”²

“The promising performance of the GEMS Water initiative provides important inputs with regard to assessment of water quality.”³

“The main outputs of UNEP’s assessment activities will include GEMS/Water freshwater assessment reports.”⁴

- How can GEMS/Water best contribute to global and regional assessment results?
- What should GEMS/Water be anticipating in terms of future needs of assessment processes and governments?
- What is the correlation between scientific monitoring/assessment and the health of an ecosystem?

The Global State of Water Quality Monitoring:

GEMS/Water has begun to report on the global state of the GEMS/Water global monitoring network, alongside the Annual Report. The purpose is to create linkages within the network and to encourage participation and regional development.

Regional and global meetings of NFPs could strengthen the network. One avenue could be on the margins of the Governing Council of UNEP. This would also strengthen countries internal political coordination.

Establishing linkages with the UNICEF/WHO Joint Monitoring Programme would also be strategic, as focusing on water quality can contribute to the Millennium and WSSD goals. The UNICEF/WHO is very important in groundwater monitoring regions, which would help fill gaps in Northern Africa and West Asia.

Water Assessment Reports:

It is recommended that GEMS/Water increase its efforts in assessments and products. The primary assessment processes that GEMS/Water should engage more fully are the Global Environmental Outlook and the World Water Development Report. Other key reports and assessment publications should be undertaken in a strategic way to include the Digital Atlas and Triennial statistical reports, and the UNEP Library Series.

The WHO retains interest in seeing GEMS/Water progress as an inter-agency initiative and as such has endeavoured to maintain the 'water resources management' series of publications which are associated with GEMS/Water. 'Water Quality Assessments' has had a significant impact in its two editions and the development of the third edition is at an advanced stage. 'Water Quality

² R. Robarts, June 2004 quote of the month, www.unesco.org/water

³ Policy statement of the Executive Director, UNEP/GC.23/2 paragraph 24.

⁴ UNEP Water Policy and Strategy UNEP/GC.23/6

'Monitoring' has also had a significant impact and the development of its second edition is also at an advanced stage. Both editions are forthcoming in 2006.

The other volumes in this series that are less closely associated with GEMS/Water are 'Water Pollution Control' (2006/7), 'Toxic Cyanobacteria in Water' (2006/7) and 'Bathing Water Monitoring'. Nevertheless the WHO sees advantages in maintaining these together as all are concerned with water resources quality. All will go into further editions or evolve into new volumes in due course. The WHO is seeking an expression of interest from GEMS/Water to be associated with the publications more formally.

The World Bank considers itself as an important client of GEMS/Water, and is involved in surface and groundwater initiatives at many levels.

Science-Policy Linkages:

The widely-accepted framework of DSPIR (Drivers-Pressures- State-Impact-Responses) should be used to guide state and trend assessments of the world's water resources. The GEO, UNEP freshwater modular assessment, the WWAP and many other global and regional assessments which use the framework, have made relatively little use of GEMS/Water in the past. One major reason could be that at the global level, studies on key parameters need to make more compelling arguments or conclusions. There is also a need to overcome the misguided notion that "if we just get the technical science right, it will inform decision-making."

Towards a new DSPIR Framework for Water Quality of Surface and Groundwater Ecosystems

Service and Use (Drivers)	Human Health Drinking Water	Agriculture	Municipal/ Industrial, Energy	Ecosystem Stability, Structure & Health	Tourism & Recreation
Pressures	Pollution	Run-off, Pollution from fertilizer and pesticide use.	Pollution from effluents Construction and other supporting infrastructural impacts	Human activities Climate change and variability	Pollution
Parameter (state)	Total Coliform Faecal Coliform Pathogens POPs DOC Chlorophyll A Turbidity	Salinity Nutrients Chlorophyll A Pathogens Pesticides Suspended solids	Nutrients Temperature Oxygen Pathogens Organic contaminants. Other contaminants such as metals. BOD and COD Heavy Metals (particularly in Sediment)	Temperature pH Conductivity Major ions Oxygen Nitrogen Phosphorus Suspended Solids Biodiversity*	Parasites Pathogens Chlorophyll A Nutrients
(Impact)	Gastrointestinal outbreaks, potential death especially to the vulnerable Lost productivity and economic	Eutrophication, and pesticide and faecal contamination of receiving waters.	Thermal and contaminant pollution of receiving waters affect food chains, biological productivity and species composition.	Loss of species. Altered food webs Increased/decreased biological productivity	Closed beaches, leisure boating restrictions, and effects on other water uses.

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