

SUMMARY AND POLICY IMPLICATIONS

VISION 2030



THE RESILIENCE
OF WATER SUPPLY
AND SANITATION
IN THE FACE OF
CLIMATE CHANGE



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WHO Library Cataloguing-in-Publication Data

Summary and policy implications Vision 2030 : the resilience of water supply and sanitation in the face of climate change.

1.Water resources development. 2.Water supply. 3.Sanitation. 4.Climate - trends. 5.Public policy. 6.Forecasting. 7.Potable water 8.Technolgy transfer.
9.Developing countries. I.World Health Organization. II.United Kingdom. Department for International Development (DFID).
III.The resilience of water supply and sanitation in the face of climate change.

ISBN 978 92 4 159842 2

(NLM classification: WA 675)

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Printed in France

FOREWORD

Providing access to safe drinking-water and basic sanitation is a proven engine driving development and promoting health. The water and sanitation targets of Millennium Development Goal 7 have galvanized the international community into a collective effort towards achieving sustainable access to drinking-water and sanitation for millions of people. To safeguard these achievements, we must remain vigilant to emerging trends and risks that could derail our efforts and undermine our impact on poor communities.

Climate change is now recognized as one of the defining challenges for the 21st century. More frequent and intense extreme weather events have resulted in a higher incidence of floods and droughts around the planet. The ensuing adverse impacts on water and sanitation services constitute a clear and present danger for development and health. New evidence, translated into new advocacy, is needed to raise the awareness in governments, international agencies, nongovernmental organizations and communities about the links between climate change and water and sanitation services, and the

consequences for health and development. In a context of relative uncertainty associated with climate change projections, policy responses will have to be formulated based on our current knowledge to address these impacts and consequences.

This document summarizes the evidence for the impact of climate change on water and sanitation technologies in the near to medium term. It aims to help policy-makers, planners, operators and communities in making practical decisions based on clear criteria, to improve the resilience of their water and sanitation services. It is part of a larger set of materials, including a full technical report and a set of background reports and guidance notes, available on the accompanying CD-ROM.

WHO and DFID have collaborated to carry out this study which has brought together our joint knowledge and expertise in water, sanitation, health and development. Ensuring optimal resilience of water and sanitation services in a globally changing climate context will be crucial to maintaining the momentum of making progress in health and development.

Dr Maria Neira

Director

Department of Public Health and Environment

THE VISION 2030 STUDY

Drinking-water and sanitation are foundations of public health and development. Citizens in developed countries take them largely for granted, yet they are carefully regulated by governments. In the developing world they are targets of development policy.

Global climate change has been on the international agenda for over a quarter of a century. The process of climate change has been confirmed to be ongoing and some further changes are now considered unavoidable. Most impacts will be experienced through more droughts, floods, and less predictable rainfall and water flows. These will place established water and sanitation services – and future gains in access and service quality – at real risk. The impacts are likely to be dramatic and severe for the billions of people who continue to seek the elusive goal of meeting their own basic needs. The effects of climate change could also cause a substantive set-back in the developed world among those who feel confident that they have secured access to basic services.

The Vision 2030 Study set out to increase our understanding of how and where climate changes anticipated in the mediumterm will affect the drinking-water and sanitation situation; what can be done to optimize the technologies and systems that exist to maximize their resilience; and what needs to be done differently to ensure that the services of the future can cope with the impacts of climate change. It focuses particularly on low- and middle income countries, where risks from climate change are greatest, and where access to water supply and sanitation services is more limited.

The study brought together evidence from projections on climate change, trends in technology application, and developing knowledge about the adaptability and resilience of drinking-water and sanitation. While the reports emanating from this study focus on issues related to the provision of water and sanitation services, installing services with a greater resilience to the impacts of climate change will rely in turn on improved management of water resources. Water resources management in this context has been extensively discussed, for example in the technical paper on water of the Intergovernmental Panel on Climate Change.

The CD-ROM that accompanies this booklet includes:

- the full technical report on which this summary is based;
- a detailed report on climate change projections;
- a detailed report on technology projections;
- a detailed review of resilience and adaptive capacity, including a series of technology-by-technology fact sheets.

FIVE KEY CONCLUSIONS OF THE VISION 2030 STUDY

1. Climate change is widely perceived as a threat rather than an opportunity. There may be significant overall benefits to health and development in adapting to climate change.

- Efforts to adapt to climate change would create a stimulus to aim directly for higher levels of service for those currently unserved, without passing through the intermediate step of communal levels of services.
- A focus on adaptation to climate change puts greater emphasis on the need to address water source sustainability from the outset of new programmes and not simply as an afterthought.
- Concern about adapting to climate change creates stronger pressure to rationalize the choice of technologies to be used to deliver sustainable and effective services.

2. Major changes in policy and planning are needed if ongoing and future investments are not to be wasted.

- Technologies capable of adapting to the range of climate scenarios need to be identified and prioritized. Some widely-used technologies will be unsustainable in some areas. Human and institutional capacities and investments need to be redirected towards sustainable solutions.
- Technologies and planning are needed that can be adapted to cope with multiple threats and not only climate change.
- Reducing water use and better demand management will be critical in managing increased piped water supply and water-

using sanitation, especially where rainfall declines.

- Community-managed drinking-water sources and supplies fail early and are frequently contaminated. Climate change will aggravate this.

3. Potential adaptive capacity is high but rarely achieved. Resilience needs to be integrated into drinking-water and sanitation management to cope with present climate variability. It will be critical in controlling adverse impacts of future variability.

- Urgent action is required to turn the potential adaptive capacity of many utility-managed water supplies to actual resilience to climate change.
- Systematic assessments of the climate change resilience of all utilities and of rural water and sanitation programmes are needed.
- Adaptations that are available need to be put in place in areas likely to face climate changes.

4. Although some of the climate trends at regional level are uncertain, there is sufficient knowledge to inform urgent and prudent changes in policy and planning in most regions.

- In sub-Saharan Africa, access to basic water supply and sanitation is low, and early adaptation is required to avert a decline in progress. In many countries this implies technology shifts.
- In North Africa and the eastern Mediter-

anean, already dry regions with high coverage and service levels, there is an urgent need to manage services and water resources to avoid further water scarcity.

- In Asia, drinking-water coverage is high with much rural reliance on protected wells. Flooding and decreasing reliability of surface waters may become major challenges.
- In central and northern South America projections suggest drying combined with infrastructure damage from extreme events.

5. There are important gaps in our knowledge that already or soon will impede effective action. Targeted research is urgently needed to fill gaps in technology and basic information, to develop simple tools, and to provide regional information on climate change.

- There are technology gaps – for example, in widely-acceptable alternatives to sewerage for cities; and in the application of data capture and signaling to inform better monitoring.
- There are significant gaps in basic information – for example, in understanding the water resource base; and on water demand from household-level access to drinking-water.
- Simple tools are needed in various areas – for example, for rapid assessment of the vulnerability of water utilities to climate change.
- There is a lack of detailed information on climate change at regional level.

WHY RESILIENCE TO CLIMATE CHANGE IS IMPORTANT

Climate variability is already a threat to water supplies and sanitation.

Floods are “normal” occurrences that continue to cause shocks for affected populations and to challenge water and sanitation managers. In many places they are likely to become more frequent with climate change.

- Floods can have catastrophic consequences for basic water infrastructure. Such damage can take years to repair.
- On a smaller scale, drinking-water infrastructure can be flooded and put out of commission for days, weeks or months.
- Where flooding of sanitation facilities occurs, there may not only be a break in services, but the flooding may distribute human excreta and its attendant health risks across entire neighbourhoods and communities.

Droughts occur, unpredictably, worldwide. In many places they are likely to become more frequent and

A quarter of the world’s population live in coastal areas, many of which are water-stressed and experiencing rapid population growth. Coastal areas experiencing sea level rise may become uninhabitable, displacing populations or forcing currently secure water sources out of use because of saline intrusion. This is of particular concern for low-lying small islands and very low-lying countries such as Bangladesh.

Where **long-term rainfall increases**, groundwater levels may rise, decreasing the efficiency of natural purification processes, increasing risks of infectious disease and of exposure to toxic chemicals.

Potential **indirect effects of climate change** on the water supply and sanitation situation include the impacts of energy interruptions, increasing the unreliability of piped water and sewerage services.



Both South Africa and Yemen have suffered extended dry periods or droughts in recent years.

The Kosi Barrage breach in Nepal in 2008 caused widespread damage and loss of life and livelihoods.

In Mozambique in 2000, flooding of 3000 septic tanks caused widespread contamination in Chokwi and Xia-Xia cities.

Floods in Bangladesh in 2007 caused

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