## CONTENTS

Water for Sustainable Socio-Economic Development ................................................................. 1
International and African Milestones .......................................................................................... 27
Indicators - Measuring the Progress of the African Water Vision .................................................. 35
Freshwater Resources in Africa .................................................................................................. 53
Water for Meeting Basic Needs .................................................................................................. 83
Protecting Ecosystems in Africa ................................................................................................. 125
Water and Urban Environments ................................................................................................. 165
Water for Food Security .............................................................................................................. 191
Harnessing Energy for Development ......................................................................................... 215
Managing Risks .......................................................................................................................... 229
Sharing Water for Regional Integration ....................................................................................... 253
Valuing Water .............................................................................................................................. 275
Ensuring the Knowledge Base .................................................................................................... 299
Governing Water Wisely ............................................................................................................. 341
Implementation of Targets under the African Water Vision and the Millennium Development Goals ................................................................................................................. 359
Conclusions and Recommendations ............................................................................................ 367
The Africa Water Development Reporting Process was initiated and coordinated by Stephen Maxwell Donkor, Ph.D Coordinator of the UN Water/Africa Secretariat at ECA- Email: donkor@un.org and this synthesis was prepared by: Kodwo Andah, PhD Scientific Coordinator Water Resources Research and Documentation Centre Perugia University for Foreigners Villa la Colombella, 06080 Colombella (PG), Italy E-mail : kandah@unistrapg.it with the assistance of the following Consultants:

<table>
<thead>
<tr>
<th>Country</th>
<th>Name</th>
<th>Contributors of boxes</th>
<th>Reviewer</th>
<th>Organization</th>
</tr>
</thead>
<tbody>
<tr>
<td>WEST AFRICA</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BENIN</td>
<td>Boukari Moussa</td>
<td>Ma. Saskia Ivens, UNECA-Southern Africa Office</td>
<td>Dr. Kodwo Andah</td>
<td>University of Perugia, Italy</td>
</tr>
<tr>
<td>GABON</td>
<td>Lasseny C. Oliver</td>
<td>Ms. Azeb Asnake, Ghana Water Resources Commission</td>
<td>Ms. Tacko Ndaiye, UNECA</td>
<td>UNECA</td>
</tr>
<tr>
<td>NIGER</td>
<td>Larmie Abdelkader Dodo</td>
<td></td>
<td>Mr. Adrian Gauci, World Bank Consultant</td>
<td>UNECA</td>
</tr>
<tr>
<td>OMVS</td>
<td>Abubacar N’Dao</td>
<td></td>
<td>Ms. Claudia Schafer, University of Dhchang, Cameroon</td>
<td>UNECA</td>
</tr>
<tr>
<td>CENTRAL AFRICA</td>
<td></td>
<td></td>
<td>Mr. Bob Munro, CEDARE, Egypt</td>
<td></td>
</tr>
<tr>
<td>Cameroon</td>
<td>Mathias Fonteh</td>
<td></td>
<td>Dr. Mathias Fonteh, IWM</td>
<td></td>
</tr>
<tr>
<td>Democratic Republic of Congo</td>
<td>Tania Kabob</td>
<td></td>
<td>Dr. Khaled Abu-Zeid, African Development Bank</td>
<td></td>
</tr>
<tr>
<td>Republic of Congo</td>
<td>Jean-Michel Ossete</td>
<td></td>
<td>Mr. Philippe Lemeriere, UNEP/UNESCO Consultant</td>
<td></td>
</tr>
<tr>
<td>Burundi</td>
<td>Dennis Barandenje</td>
<td></td>
<td>Mr. Andrew Makokha, UN ISDR Consultant</td>
<td></td>
</tr>
<tr>
<td>EAST AFRICA</td>
<td>Kefyalew Achamyleh</td>
<td></td>
<td>Mr. Sethdeh Vordzogbe, African Development Bank</td>
<td></td>
</tr>
<tr>
<td>Ethiopia</td>
<td></td>
<td></td>
<td>Mr. Salif Diop, UNEP</td>
<td></td>
</tr>
<tr>
<td>NORTH AFRICA</td>
<td></td>
<td></td>
<td>Mr. Mohammed Tawfik, WMO</td>
<td></td>
</tr>
<tr>
<td>Tunisia</td>
<td>Hassen Lofti Frigu</td>
<td></td>
<td>Mr. Datus Rubatsoya, UNESCO</td>
<td></td>
</tr>
<tr>
<td>Mauritania</td>
<td>Baba O. Soufi</td>
<td></td>
<td>Dr. Emmanuel Naah, UNHABITAT</td>
<td></td>
</tr>
<tr>
<td>Algeria</td>
<td>Ladjel Mahmoud</td>
<td></td>
<td>Dr. Daniel Adom, UNESCO SRO-SA</td>
<td></td>
</tr>
<tr>
<td>Morocco</td>
<td>Mokhtar Bizou</td>
<td></td>
<td>Ms. Saskia Ivans, UNESCO SRO-SA</td>
<td></td>
</tr>
<tr>
<td>Egypt</td>
<td>Khaled Abu-Zeid</td>
<td></td>
<td>Dr. Gladys Mutamgara, UNESCO SRO-NA</td>
<td></td>
</tr>
<tr>
<td>Sudan</td>
<td>Abdalla Ahmed</td>
<td></td>
<td>Mr. Lamine Gueyes, UNCA</td>
<td></td>
</tr>
<tr>
<td>Libya</td>
<td>Omar Salem</td>
<td></td>
<td>Dr. Stephen Maxwell Donkor, Mr. Emmanuel Nwukor</td>
<td></td>
</tr>
<tr>
<td>North Africa</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Synthesis</td>
<td>Mokhtar Bizou</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SOUTH AFRICA</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Swaziland</td>
<td>Emmanuel Mwendera</td>
<td></td>
<td>Mr. Yinka Adeyemi, Program Assistant</td>
<td></td>
</tr>
<tr>
<td>Zambia</td>
<td>Jonathan, Kampata</td>
<td></td>
<td>Ms. Aster Gebremariam, Administrative Assistant</td>
<td></td>
</tr>
<tr>
<td>Mozambique</td>
<td>Juzio Dinis luis</td>
<td></td>
<td>Ms. Eleni Hamawi, Coordinating Assistant</td>
<td></td>
</tr>
<tr>
<td>Botswana</td>
<td>Jaap Amtzen</td>
<td></td>
<td>Ms. Elleni Negash, National Reporting</td>
<td></td>
</tr>
<tr>
<td>Lesotho</td>
<td>Sechoha Makhoalibe</td>
<td></td>
<td>Ms. Tehetena Alemu, Coordinator</td>
<td></td>
</tr>
<tr>
<td>Zimbabwe</td>
<td>Dominic Mazvinavi</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>South Africa</td>
<td>Brian Hollingsworth</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Malawi</td>
<td>Osborne Shela</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Angola</td>
<td>Manuel Quintino</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mauritius</td>
<td>Mantha Devi Nowbuth</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Southern Africa</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Synthesis</td>
<td>Emmanuel Mwendera</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
ACKNOWLEDGEMENTS

This is the final version of the African Water Development Report (AWDR) covering more than 25 African countries. It comes after the interim edition, which was prepared for review at the Pan African Implementation and Partnership Conference on Water (PANAFCON), held in Addis Ababa in December 2003 to round off the International Year of Freshwater. It is one of the tangible outcomes of the joint efforts of all United Nations Agencies active in the water sector in Africa, UN-Water/Africa and affiliated institutions/experts at national levels.

This process was undertaken under the general direction of all the heads of the participating agencies, including the United Nations Environment Programme (UNEP), the United Nations Educational, Scientific and Cultural Organization (UNESCO), the World Meteorological Organization (WMO), the United Nations Human Settlements Programme (UN-HABITAT), the Food and Agricultural Organization of the United Nations (FAO), the United Nations Development Programme (UNDP) and the United Nations Economic Commission for Africa (ECA).

ECA assumed its responsibility of producing and publishing the Report under the overall leadership of its Executive Secretaries, K.Y. Amoako and Abdoulie Janneh.

We acknowledge the support provided by Josue Dione, Director of the Sustainable Development Division of ECA and Mr. Mohammed Tawfik of WMO, who is the current Chairperson of the UN-Water/Africa Group.

The Netherlands Ministry of Development Cooperation provided the seed funding for the AWDR process, as part of its support to UN-Water/Africa under the Interagency Group for Water in Africa (IGWA) project. Our appreciation also goes to the African Development Bank for its financial contribution to the interim edition and for reviewing the drafts.

I would like to acknowledge with thanks, the invaluable contributions of all the agencies, reviewers and national writers. Special appreciation goes to Dr. Kwadwo Andah of the University of Perugia for the excellent synthesis of the Report which was undertaken with passion and conviction. The Report is a self-defined and sustainable monitoring tool to measure progress in the implementation of the Africa Water Vision 2025 and the Millennium Development Goals (MDGs) as they pertain to water.

Special appreciation goes to the consulting Editor, Emmanuel Nwukor and members of the ECA Communication Team led by Yinka Ayeyemi for guiding the publication process of this final edition.

Stephen Maxwell Donkor
Coordinator, UN Water/Africa
PREFACE

The general level of water resources development for meeting the needs of the African populace (for potable drinking, food security and other necessities of human life) is still very low. This situation could be a blessing in disguise if proper policy frameworks for planning, development, and management of water resources in African countries can be devised, taking advantage of the advancement in water science and technology and also the positive and negative experiences of the technologically-advanced countries through appropriate knowledge and technology transfer mechanisms. It is well known that the levels of scientific and technological tools for harnessing the resources of water bodies in its many forms of occurrence (rivers, lakes, seas and others), have exerted decisive influence on the development of human society and determined the level of general socio-economic development. It is therefore obvious that any accelerated development in Africa would, to a very large extent, depend on how effectively African countries are able to harness their water resources for a sustainable socio-economic development and, above all, for the eradication of endemic poverty without impairing the environment.

As we observed in the interim report of the **African Water Development Report** (AWDR), never in the history of the tortuous efforts in Africa aimed at reversing decades of endemic poverty and pervasive underdevelopment in Africa has the realization of the cardinal role of water in socioeconomic development been so high as at present. This positive trend has been achieved through decades of International and African concerted efforts at evolving policies and strategies for effective water resources development and management, culminating in the adoption of the Dublin Principles of Integrated Water Resources Management. These processes can generally be referred to as the “**Water Journey from Rio to Johannesburg**”. It is within this process that the African Water Vision 2025 was launched at the 2\(^{nd}\) World Water Forum at The Hague in 2000, with the following message:

“An Africa where there is an equitable and sustainable use and management of water resources for poverty alleviation, socio-economic development, regional cooperation, and the environment”.

In recognition of the growing water crisis the world over, the United Nations family organizations launched a system-wide project called the **World Water Assessment Programme** (WWAP) to develop tools and skills that would foster a better understanding of the basic processes, management practices and policies that ensure that clean and sufficient water is available to all in a sustainable manner. The World Water Development Report (WWDR) was also instituted to publish, at regular intervals, the main trends and results of this process. It is intended to provide decision-makers at continental, sub-regional, regional, national and river basin levels with information that can be used at various levels to govern water wisely. The first WWDR was published in March 2003.

Due to the particular problems of water resources development and management in Africa, the **Inter-Agency Group on Water** in Africa (now referred to as UN-Water/Africa), took a challenging decision in April 2001 in Niamey to develop an African Water Development Report (AWDR). The AWDR would afford African countries and other stakeholders the necessary tools and skills to monitor the goals and targets of the African Water Vision, concisely formulated as follows:

*Water can make an immense difference to Africa’s development if it is managed well and used wisely. Given clear policies and strategies and real commitments to implementation, we can use water to help eradicate poverty, reduce water-related diseases and achieve sustainable development.*
The African Water Development Report (AWDR) is, therefore, intended to be more in-depth and African-owned but linked methodologically to WWAP and form an integral edition of WWDR.

The objectives of the AWDR are to:

- Provide a lasting and durable mechanism to monitor progress made in implementing the African Water Vision;
- Provide African decision makers with an authoritative basis for managing Africa’s water resources; and
- Serve as an integrative programme for the strengthening of UN-Water/Africa.

The AWDR is structured to comprise:

An introductory section covering: water for socio-economic development, international and African milestones, freshwater resources of Africa and the main body, articulated along eleven key challenges.

1. **Meeting basic needs**: To recognize that access to safe and sufficient water and sanitation are basic human needs and are essential to health and well-being, and to empower people, especially women, through a participatory process of water management;

2. **Securing the food supply**: To enhance food security, particularly of the poor and vulnerable, through the more efficient mobilisation and use, and the more equitable allocation of water for food production;

3. **Protecting ecosystems**: To ensure the integrity of ecosystems through sustainable water resources management;

4. **Sharing water resources**: To promote peaceful co-operation and develop synergies between different uses of water at all levels, whenever possible, within and, in the case of boundary and trans-boundary water resources, between states concerned, through sustainable river basin management or other appropriate approaches;

5. **Managing risks**: To provide security from floods, droughts, pollution and other water-related hazards;

6. **Valuing water**: to manage water in a way that reflects its economic, social, environmental and cultural values for all its uses, and to move towards pricing water services to reflect the cost of their provision, taking into consideration the basic needs of the poor and the vulnerable;

7. **Governing water wisely**: To ensure good governance so that the involvement of the public and the interests of all stakeholders are included in the management of water resources;

8. **Water and Cities**: Covering issues of urban areas and human settlements and their specific challenges to water management;

9. **Water and industry**: To focus on industry needs in water and the responsibility to respect water quality and to take account of the needs of competing sectors;

10. **Water and energy**: To recognize that water is vital for all forms of energy production and the need to ensure that energy requirements are met in a sustainable manner; and

11. **Ensuring the knowledge base**: To recognize that good water policies and management depend upon the quality of knowledge available to decision makers.

A strategy was set up for the preparation of the first AWDR to be launched at the December 2003 Pan-African Water Conference (PANAFCON), led by UN-Water/Africa and other partners. However, due to unforeseen problems, which have held up production schedule and editorial mechanisms for the analysis and writing of country, sub regional and basin reports, we decided to come up with an interim edition, which based on some few national reports mainly from the western and central sub regions. The interim report was distributed during the PANAFCON conference with the intent of attracting feedbacks for its improvement and was also published in March 2004 in time for the meeting of the United Nations Committee on Sustainable Development in New York.

The process was continued with renewed vigour to cover the northern and southern sub
regions. It is with satisfaction that we can state that all the countries in these sub regions presented their national reports and sub regional synthesis reports for Both Northern and Southern Africa have also been prepared. Due to lack of coherent and homogeneous data sets and indicators amongst various African countries, it was difficult to formulate the AWDR as an African regional synthesis report. The present document was therefore formulated by blending official data and indicators from various United Nation system wide organisations with those of the National reports within a framework of state of the art of hydro-climatic processes and water resources management in a sustainable environment. In this way, AWDR attempts to bring to policy and decision makers the status and perspectives of water resources development in the African region, bearing in mind the modern advances in science and technology. It must be emphasised that Africa needs strong environmentally scientific and technological approach to water resources assessment and development and not environmental politics which normally does not take into consideration the basic needs and aspirations of the majority of the African population living under endemic poverty. It is therefore hoped that by by linking the AWDR in the future with the WWDR, Africa can take full advantage of the rich store of scientific and technological knowledge and information bases largely available in the developed world in order to fully infuse the present day advances in science and technology into water resources development and management in Africa. In order to achieve some success in water security and environmental sustainability, it is vital that all African countries augment efforts at systematically monitoring key water and environmental parameters such as water quantity and quality, water use, biodiversity and land degradation towards developing homogenous indicators for decision makers and all interested stakeholders. Due to multiplicity of transboundary basins in Africa, regional and sub-regional cooperation is needed in establishing measurement stations and systems to collect and analyse such data with active participation of scientific advisory bodies.

In conclusion, the institutionalisation of the African Water Development Report (AWDR) as a monitoring and management tool for Policy makers, planners and practitioners is a task whose sustainability must be at the forefront of considerations by all interested parties in the development of Africa’s water resources for socio-economic development. This is the challenge which all component members of the UN Water/Africa, national water-related institutions, scientific bodies and other stakeholders must collectively accept in order to initiate actions towards evolving a dynamic system of monitoring the progress in the implementation of the African Water Vision and other international challenges such as the Millennium Development Goals. There is no more time for sideliners or referees, all must become players so that the next edition of AWDR in two years’ time shall decisively be better than the present one.

Josue Dione
Director, Sustainable Development Division
United Nations Economic Commission for Africa