



UNEP / UNESCO
South African Department of Water Affairs and Forestry
University of the Western Cape

INTERNATIONAL WORKSHOP: GROUNDWATER PROTECTION IN AFRICA

BACKGROUND:

At the Millennium Summit in 2000 and during the 2002 World Summit on Sustainable Development (WSSD) in Johannesburg, world leaders recognised the integral importance of fresh water to human development, and committed themselves to a precise, time-bound agenda for addressing the world's current and future water resource and sanitation problems. This commitment formed a strong basis for discussion at CSD-13 on developing strategies to achieve the goal of universal safe drinking water supply, as well as providing a policy framework to leverage national and international support in support of this goal.

In this context, the New Partnership for Africa's Development (NEPAD) Water Agenda and the constitution of the Africa Ministers' Council on Water (AMCOW) exemplify political developments in the pursuit of this objective. At the 2003 Pan-African Implementation and Partnership Conference on Water, African ministers also examined the continent's water challenges and recognised the multisectoral nature of water resources development in the context of socio-economic development, as well as the multi-interest utilisation of water resources for water supply and sanitation, agriculture, industry, urban development, low and flat lands management, and other activities covered by new IWRM policies to which groundwater is central.

At a regional level, groundwater is of vital importance in Africa, Asia, Central and South America. The past 50 years have seen the unprecedented development of groundwater resources in these regions. Nationally, many countries are dependent upon groundwater, with an estimated 2 billion people worldwide relying on aquifers for their drinking water supply. Numerous African countries rely on groundwater for their drinking water, both from shallow hand-dug wells and from deeper public water boreholes. In a rural context, groundwater provides the mainstay for agricultural irrigation and will be the key to providing additional resources for food security. In urban centres, groundwater supplies are important as a source of relatively low cost and generally high quality municipal and private domestic water supply.

Most of the problems affecting groundwater are associated with human development. The most common problem posing a threat to groundwater supply is degradation of the water

quality due to surface-level pollution or saline intrusion. In most African countries, groundwater pollution or degradation is the main threat to the achievement of sustainable water resources management.

For the purpose of providing practical information on the environmental aspects of the management and sustainable use of groundwater resources, UNEP and UNESCO started in 2000 a joint effort with ECA and UN-HABITAT to assess groundwater vulnerability in African cities. A network of 11 countries from West, East and Southern Africa (Benin, Côte d'Ivoire, Niger, Ghana, Mali, Burkina Faso, Senegal, Ethiopia, Kenya, Zambia and South Africa) was established to develop appropriate methodologies for optimal monitoring of the pollution of urban aquifers.

Scientists, local authorities, non-governmental organisations, private business and international organisations are pooling together their efforts to improve the management of this vital resource. It is becoming increasingly obvious that the availability of groundwater resources will have a critical impact on the African Water agenda for poverty reduction.

PURPOSE: To build on the recent groundwater pollution vulnerability and risk assessment in 11 African countries as part of a major UNEP/UNESCO supported project, as well as the groundwater protection experience in a number of developing and developed countries, and work towards a groundwater protection strategy suitable to Africa's physical and socio-economic environment.

This international workshop on groundwater protection in Africa is a joint initiative of the United Nations Environment Programme (UNEP) and the United Nations Educational Scientific and Cultural Organisation's division of International Hydrology Programme (UNESCO/IHP) regional office in Nairobi in partnership with the Global Environment Monitoring System (GEMS) Water Programme, the University of the Western Cape (UWC), South Africa's Water Research Commission (WRC), University of the Free State, Institute for Groundwater Studies (IGS), International Association of Hydrological Sciences (IAHS), International Atomic Energy Agency – IAEA/Water Resources Programme, United Nations UN-Water, Belgian Development Cooperation (Be), International Association of Hydrogeologist (IAH), Development Cooperation Ireland (DCI), African Ministerial Conference on Water (AMCOW), New Partnership for Africa's Development (NEPAD) and the United Nations Human Settlements Programme (UN-HABITAT).

Specifically a project proposal will be formulated through which a groundwater protection strategy will be refined and implemented in a significant number of African countries.

DATE: 28 – 30 November 2005

VENUE: University of the Western Cape, Cape Town, South Africa

PARTICIPANTS:

- African country specialists;
- AMCOW Technical Advisory Committee;
- Regional/international experts on groundwater management in developing countries;
- Other persons with appropriate experience and interest in the protection of groundwater in Africa will be invited.

PROVISIONAL PROGRAMME

Time	Day 1	Responsibilities
08h30 – 09h00	Registration of participants	UWC team
5 min	Welcome	UWC-Rector
15 min	Opening	Minister DWAF
30 min	Key Note Presentation	Professor K Asmal, MP
15 min	Message	UNEP
10h30 – 11h00	Tea break	
11h00 – 12h30	Session 1: GROUNDWATER VULNERABILITY AND RISKS IN AFRICA	Session 1: Chair
10 min	Introduction to the UNEP/UNESCO project	Y Xu: UWC
60 min	Selected case studies on the assessment of groundwater vulnerability in different environments in Africa (UNEP/UNESCO project)	Hamadoun BOKAR - Mali Tenalem Ayenew Tegaye - Ethiopia Moussa Boukari - Benin Nkhuwa, D.C.W - Zambia
20 min	Impact of UNEP/UNESCO project	B Usher : IGS, UVS
12h30 – 13h30	Lunch break	
13h30 – 16h00	Other groundwater vulnerability and risk assessment initiatives around the world	
50 min	Other African Experiences	H Vogel: Geological Survey Botswana G Tredoux: CSIR
30 min	Groundwater Protection in China	Dan Liu: SWJTU - China
30min	Combining Social and Aquifer vulnerability	Hector Massone: Argentina
20 min	Regional groundwater contamination of industrial mega sites	P Wysisk: Germany
20 min	Discussion & Summary of Session 1	ALL Julian Conrad / Shafic Addams Rian Titus
16h00 – 16h30	Tea Break	
16h30 - 18h00	Session 2: GROUNDWATER PROTECTION	Session 2: Chair
45 min	Groundwater Protection Zoning: Background and development. Application in porous, fractured and karst media.	Ken Bradbury - University of Wisconsin, USA
30 min	South African protection framework (RDM)	H. Pienaar: DWAF
20 min	Development of a policy on Protection Zoning for South Africa	J Nel and Y Xu : UWC
18h30 – 20h00	Cocktail Function – V&A Waterfront	ALL

Day 2 (Chair :)		
	Session 2 (Continued): GROUNDWATER PROTECTION	Session 2: Chair
08h30 - 10h30	Groundwater protection zoning experiences and initiatives around the world	
30 min	Overview of Source Protection in Britain	Nic Robins: BGS –UK
20 min	Source Protection Zones in Britain	Jude Cobbing: CSIR
20 min	Pitfalls on the implementation of zoning in Botswana	I. Mannathoko: Botswana
20 min	Hazard from Cattle Burial Sites	C Chilume - Botswana
30 min	Discussion	All
10h30 – 11h00	Tea break	
11h00 – 12h30	Groundwater protection zoning experiences and initiatives around the world	

30 min	Impact of Urbanisation - Tanzania	Naomi Lupimo
30 min	Transboundary Diagnostic Analysis	Kissao Gnandi - Togo
20 min	Discussion	ALL
10 min	Summary Session 2	Carin Bosman/ Rian Titus
12h30 – 13h30	Lunch break	
13h30 – 15h00	Session 3: GROUNDWATER PROTECTION POLICIES and STRATEGIES	Session 3: Chair
13h30 – 15h00	Dialogue between policymakers and scientists Public participation, information and awareness Panel Session Presentations to trigger discussion	Boniface Aleobua: DWAF S Donkor: H Pienaar: DWAF
15h00 – 15h30	Tea Break	
15h30 – 17h00	Session 3 (Continued): GROUNDWATER PROTECTION POLICIES and STRATEGIES	Session 3: Chair
20 min	Human and Animal Health	UWC
20 min	Economic value of water resources	Nhalanhla Mbatha
20 min	Social implications related to land use limitations	PLAAS
30 min	Science into policy	Carin Bosman: DWAF
17h30 – 20h00	Main Function	ALL

	Day 3	
08h30 – 10h30	Session 3 (Continued): PROJECT FORMULATION	Session 3: Chair
60 min	Organisation Perspective How do we take the groundwater protection forward? Pitfall experiences/ Success stories Support to project	UNEP IAEA: C Gaye World Bank: Albert Tuinhof GEF: Shammy Puri NEPAD DWAF: C Moseki CMC: Rodney Bishop
9h30 – 10h30	Rapporteur : Presentation on project proposal formulated during preceding sessions. Facilitated Session	Contributions: Local Government AMCOW/TAC Scientists
10h30 – 11h00	Tea Break	
11h00 – 12h30	Facilitated Session (Continued) Rapporteur	Contributions: Local Government AMCOW/TAC Scientists
12h30 – 13h30	Lunch Break	
13h30 – 15h30	Facilitated Session (Continued) Rapporteur	Contributions: Local Government AMCOW/TAC Scientists
15h30 – 16h00	Tea Break	
16h00 – 18h00	Project Proposal	Rapporteur
	Discussion & Adoption	ALL
	Concluding Remarks	S Diop, E Naah and E Braune

Optional 2 Day Short Course

A short course has been arranged to directly follow the International Workshop. The short course will focus on the technical aspects of protection zoning. The cost of the short course is R2500 (\$370) and will be held on the 1st and 2nd December 2005.

This course will guide participants to determine the size and shape of the borehole protection zone, considering the hydrogeologic characteristics of the aquifer system, and the design and operational characteristics of the borholes used to pump water from the aquifer system. Special attention will be given to the delineation of capture zones for fractured rock aquifers.

Contact Jaco Nel at jmnel@uwc.ac.za for further information.

International Organising Committee

S. Diop, UNEP (Chair); H. Drammeh, UNEP; E. Naah, UNESCO; Prof. Yongxin Xu, South Africa; Prof. Eric Odada, Kenya; S. Donkor, ECA; D. Adom, UN HABITAT; Dr. John Mugabe, NEPAD; Prof. Wolfgang Kinzelbach, Switzerland; Prof. Eberhard Braune, South Africa; Dr. Rudy Herman, Belgium; AMCOW/TAC and UN Water.

Local Organising Committee

Prof. Yongxin Xu, the University of the Western Cape (Chair); Dr. Shafick Adams, the University of the Western Cape; Mr. Jaco Nel, University of the Western Cape; Dr. Kevin Petersen, Water Research Commission; Mr. Harrison Pienaar, Department of Water Affairs and Forestry; Mr. Chris Moseki, Department of Water Affairs and Forestry; Dr. Brent Usher, the University of the Free State; Dr. Gedion Tredoux, CSIR; Mr. Rodney Bishop, City of Cape Town and Mr. Segun Adelana, IAH.