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New Atlas Shows Africa's Vulnerable Water Resources in Striking Detail

From “hotspots” to “hopespots”, the *Africa Water Atlas* maps out challenges and opportunities for water across 53 countries

Addis Ababa/Nairobi, 25 November 2010 –The major challenges facing Africa's water resources have been laid out in striking clarity in a new atlas compiled by the United Nations Environment Programme (UNEP). The *Africa Water Atlas* uses hundreds of ‘before and after’ images, detailed new maps and other satellite data from 53 countries to show the problems facing Africa's water supplies, such as the drying of Lake Chad and the erosion of the Nile Delta, as well as new, successful methods of conserving water.

Some of the most compelling images in the Atlas, which was launched during Africa Water Week in Addis Ababa, include algal bloom in Lake Victoria and agricultural run-off in Uganda, pollution from oil spills in Nigeria and a 3km segment of the Nile Delta that has been lost to erosion.

Research carried out for the Atlas shows that the amount of water available per person in Africa is declining. At present, only 26 of the continent's 53 countries are on track to attain the water-provision target of the Millennium Development Goals (MDGs) to reduce by half the proportion of the population without sustainable access to drinking water by 2015.

Furthermore, only nine countries in Africa are expected to attain the MDG target of reducing by half the proportion of the population without sustainable access to basic sanitation by 2015.

But in addition to these water challenges, the Atlas maps out new solutions and success stories from across the continent. It contains the first detailed mapping of how rainwater conservation is improving food security in drought-prone regions. Images also reveal how irrigation projects in Kenya, Senegal and Sudan are helping to improve food security.

The Atlas, compiled by UNEP at the request of the African Ministers' Council on Water (AMCOW) shows how the challenges of water scarcity in Africa are compounded by high population growth, socioeconomic and climate change impacts and, in some cases, policy choices.

Prepared in cooperation with the African Union, European Union, US Department of State and United States Geological Survey, the 326-page atlas gathers information about the role of water in Africa's economies and development, health, food security, transboundary cooperation, capacity building and environmental change in one comprehensive and accessible volume. All images from the atlas are free to use and can be downloaded from www.na.unep.net/atlas.

In total, the *Africa Water Atlas* features over 224 maps and 104 satellite images as well as some 500 graphics and hundreds of compelling photos. The ‘before’ and ‘after’ images, some of which span a 35-year period, offer striking snapshots of local ecosystem transformation in several watersheds being converted to agriculture across the continent.

In addition to well-publicised changes, such as the drying up of Lake Chad, one of the Sahel's largest freshwater reservoirs, or the declining Lake Faguibine in the Niger River Basin and falling water levels in Lake Victoria, the Africa Water Atlas presents satellite images of lesser-known environmental challenges including:

- Erosion and sinking of the Nile Delta: The Rosetta Promontory lost over 3 km to erosion between 1968 and 2009, while the Damietta Promontory eroded 1.5 km between 1965 and 2008. Furthermore, the delta is currently sinking under its own weight, as new deposits of soil no longer offset the natural effect of soil compaction.
- Surface runoff from the Entebbe area south of Kampala, Uganda shows up as greenish clouds expanding out into the water as eroded soil, agricultural runoff and domestic waste runs into Lake Victoria, degrading water quality and causing a bloom of algae.
- In the Niger River Basin, thousands of oil spills, totaling over three million barrels of oil and wastewater from oil production, are among the primary causes of a serious decline in water quality.
- Overflow from Egypt's Lake Nasser spillway created the Toshka lakes, which have since largely disappeared due to evaporation and, to a lesser degree, infiltration.

The *Africa Water Atlas* also draws attention to Africa's "water towers", which are sources for many of Africa's transboundary rivers and contribute immensely to the total stream flow of African major rivers. These supply life-giving resources and services in downstream areas such as water for hydropower, wildlife and tourism, small and large scale agriculture, municipalities and ecosystem services. The Water Atlas shows that most of these water towers, from the Middle Atlas Range in Morocco through to the Lesotho Highlands in Southern Africa, are under extreme pressure as a result of deforestation and encroachment.

- Many areas of the Mau Forest Complex, the largest of Kenya's water towers, had already been converted to agriculture in the 1970s. Over 100 000 ha of forest, representing roughly one-quarter of the Mau Complex's area, have been destroyed since 2000. By 2009, several additional large forest areas had been converted to agriculture.

Africa is known to be a global "hotspot" for water constrained, rain-fed agriculture and climate-driven food insecurity with about 100 million people in Africa living in these areas. But new research, captured in the Atlas, reveals that there are also "hospots" in drought-prone environments where there is enormous potential for expanding simple water-harvesting techniques.

For the first time, the wide distribution of these "hospots" has been overlain on a map. Images from the Water Atlas show how the successful harvesting of rainwater in the Horn of Africa, particularly in Kenya, is already mitigating the risk for farmers and helping to reduce food insecurity in their communities.

The Atlas also highlights positive examples of water management that are protecting against, and even reversing, degradation.

- The damming of the Logone River in the Lake Chad Basin in the 1970s coincided with a period of drought that reduced overbank flooding and disrupted local livelihoods on the Waza Logone Floodplain. Managed releases from the dam beginning in the 1990s restored some of the natural flooding, bringing improved grazing and the return of other valuable ecosystem functions.

- Sudan's massive Gezira Irrigation Scheme, built in the early 20th century, and other schemes such as Rahad, New Halfa and the Kenana Sugar Plantation, which were built in the 1960s and 1970s, help rank Sudan second in Africa after Egypt in terms of land under irrigation.
- Along the Senegal River, irrigation schemes beginning in the 1940s and other large investments in the 1980s, including the construction of the Manantali Dam in Mali and the Diama Dam in Senegal, have increased irrigation potential within the Senegal Basin.
- The Great Man-Made River Project in Libya, which began roughly 30 years ago, is among the largest civil engineering projects in the world. The project brings water from well fields in the Sahara to Libya's growing population. The majority of the system's water comes from Libya's two largest groundwater resources—the Murzuq and Kufra groundwater basins. As much as 80 per cent of Libya's groundwater is used for agriculture.

Main Findings and Key Concerns

The main findings of the *Africa Water Atlas* present challenges and opportunities for Africa as the continent strives to improve the quantity, quality and use of its water resources. These challenges focus on the two-sided nature of water issues in Africa: surplus and scarcity, under developed and over-exploited.

Overall, according to the authors, more than 40 percent of Africa's population lives in arid, semi-arid and dry humid areas. The amount of water available per person in Africa is far below the global average and is declining. Groundwater is falling and rainfall is also declining in some regions. Development of water resources is inadequate and prices to access water are generally distorted, with water provision highly inefficient.

After Australia, Africa is the world's second-driest continent. With 15 percent of the global population, it has only 9 percent of global renewable water resources. Water is unevenly distributed, with Central Africa holding 50.66 percent of the continent's total internal water and Northern Africa only 2.99 per cent.

The groundwater resources represent only 15 percent of total renewable water resources, but supply about 75 percent of Africa's population with most of its drinking water. In all regions except central Africa, water availability per person (4 008 m³ in 2008) is under both the African and global averages and lower than that of all of other world regions except Asia, the most populous continent.

Most of the urban population growth has taken place in peri-urban slum neighbourhoods, overwhelming the capacity of water supply networks and resulting in an overall decline in piped water coverage. Between 2005 and 2010, Africa's urban population grew at a rate of 3.4 per cent, or 1.1 percent more than the rural population.

Only 26 of the 53 countries are on track to attain the MDG water-provision target of reducing by half the proportion of the population without sustainable access to drinking water by 2015.

Of Africa's 53 countries, only nine are expected to attain the target of reducing by half the proportion of the population without sustainable access to basic sanitation by 2015.

Opportunities to address the woefully inadequate access to improved sanitation include the potential to encourage and support simple entrepreneurial solutions and to embark on a new drive

to revolutionize toilets so they are as desirable as mobile phones. The number of mobile cell phone subscribers in Africa reached 448.1 million in 2009, representing an increase of 75 million new users since the previous year and an impressive growth of 20 percent in the customer base since 2008.

Data in the Africa Water Atlas shows that the adoption of improved sanitation, however, has grown at a much slower rate. The vast improvements being made in access to communications technologies in Africa provides an example of how innovation and entrepreneurship in sanitation technologies could also reap economic benefits and improve health and well-being.

Africa has 63 shared water basins. It is a challenge to address potential conflicts over transboundary water resources. On the other hand, there are already at least 94 international water agreements in Africa to cooperatively manage shared waters.

Water scarcity challenges Africa's ability to ensure food security for its population. Agriculture uses the most water in Africa and the estimated rate of agricultural output increase needed to achieve food security is 3.3 percent per annum.

Hydroelectricity supplies 32 percent of Africa's energy, but its electricity use is the lowest in the world. Africa's hydropower potential is under-developed.

Africa is endowed with large and often under-utilized aquifer resources that contain excellent quality water and could provide water security in times of drought. But the continent faces the challenge of providing enough water for its people in a time of growing demand and increased scarcity.

Africa is one of the most vulnerable continents to climate change and climate variability. The continent is already subject to important spatial and temporal rainfall variability. Some regions are becoming drier and floods are occurring more regularly with severe impacts on people's livelihoods.

Africa faces a situation of economic water scarcity, and current institutional, financial and human capacities for managing water are inadequate.

Taking advantage of the latest space technology and Earth observation science, the Africa Water Atlas serves to demonstrate the potential of satellite imagery data in monitoring changes in ecosystems and natural resources. This technology can provide the kind of hard, evidence-based data to support political decisions aimed at improving management of Africa's surface basins and aquifer resources.

Notes to Editors

The Africa Water Atlas features over 224 maps and 104 satellite images as well as some 500 graphics and hundreds of compelling photos. The *Africa Water Atlas* makes a major contribution to the state of knowledge about water in Africa by bringing together information about water issues in each country and summarizing the state of their progress towards the MDG water targets, synthesizing water issues by looking at them from the perspective of challenges and opportunities and providing distinctive profiles of transboundary water basins and country.

All the materials in the Atlas are non-copyrighted and available for free use as long as the Atlas is acknowledged as the source.

Individual satellite images and other graphics can be downloaded from
www.na.unep.net/atlas

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