



Water Use and Rights (Africa)

Water is a fundamental ingredient for poverty alleviation and sustainable socioeconomic development in Africa. Low availability and access to this life-sustaining resource have important implications for its development and use. As population growth, rapid urbanization, and industrialization lead to an even greater demand for water, unambiguous water rights will determine the course of future water development and use across the continent.

Africa is a continent of extremes in matters of water resources. It is one of the driest regions on Earth, but it also experiences large amounts of rainfall. The Congo (Zaire) River is one of the world's largest rivers by volume, while the Nile is the world's longest. Abundant rainfall in Central Africa supports the Congo Basin forests, the second largest intact tropical rain forest block in the world; meanwhile, the Sahara in the north and the Kalahari and Namib in the south are among the world's largest deserts.

Africa's Freshwater Resources

In sub-Saharan Africa (SSA), rainfall patterns that determine freshwater abundance vary from one subregion to the other, and so does the occurrence of other freshwater sources such as rivers, lakes, streams, springs, and groundwater aquifers. To underscore these subregional differences, the Food and Agricultural Organization's (FAO) division of Africa into seven subregions is used here, with the concentration on the subregions that make up SSA. (See figure 1 on page 364.) Water statistics throughout this article, except where otherwise mentioned, are derived from FAO–

AQUASTAT Information Systems on Water and Agriculture Database. (See table 1 on page 365.)

Major freshwater basins in SSA include the Senegal and Volta river basins in the Gulf of Guinea; Lake Chad and the Niger River basin in the Sudano-Saharan region; Lake Turkana and the River Nile basin in eastern Africa; the Ogooué and Congo river basins in central Africa; and the Zambezi and Orange river basins in southern Africa. These freshwater basins are predominantly transboundary. Indeed, two or more countries share more than fifty freshwater water basins and numerous groundwater aquifers in Africa. Water allocation among competing uses and users in Africa therefore necessitates interstate cooperation.

Put together, SSA accounts for 9 percent of global internal renewable water resources, compared to 28.9 percent for Asia and 15.2 percent for Europe. With about 12 percent of the global population, SSA is therefore not water-poor by global standards.

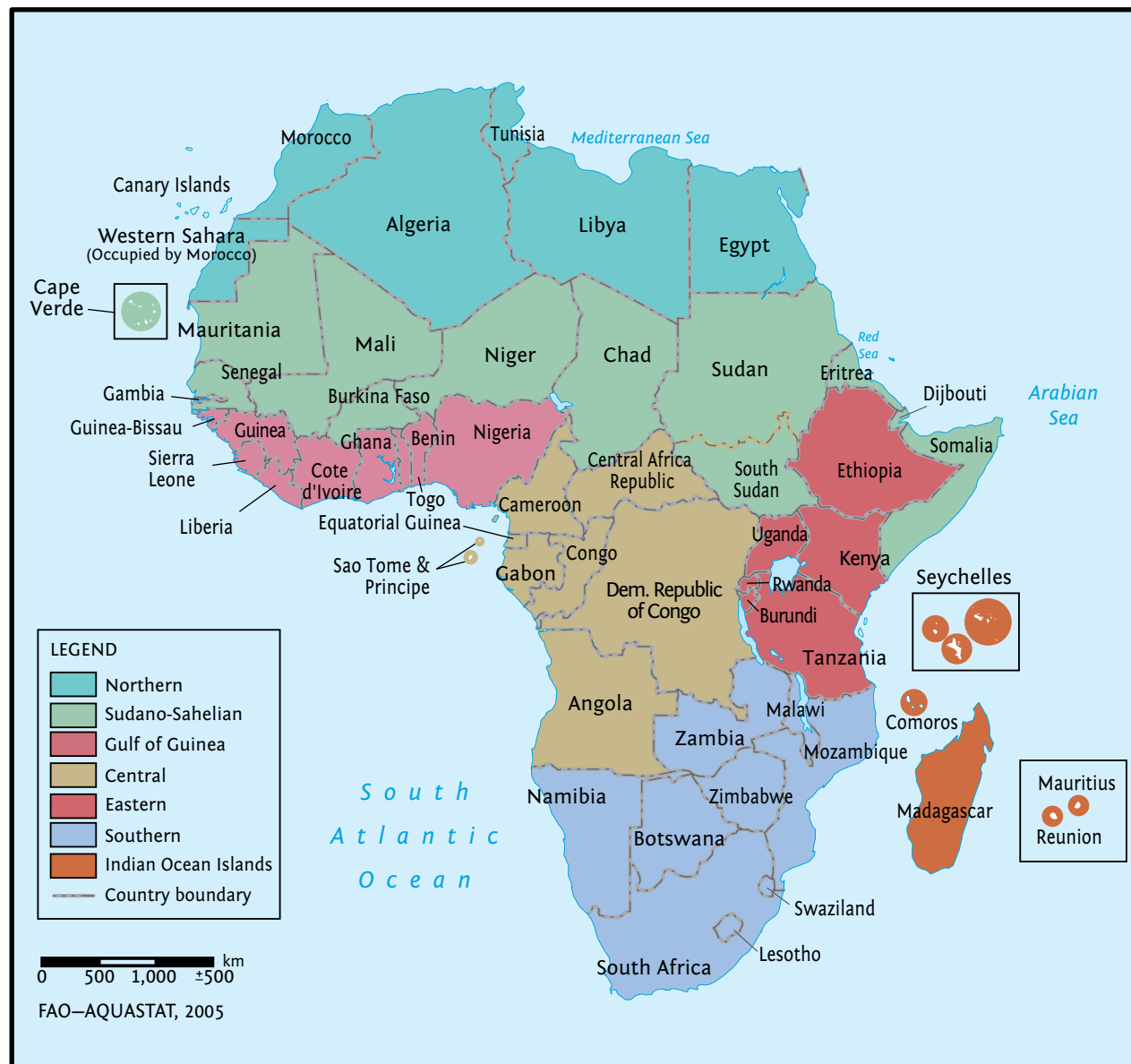
This regional overview, however, masks important subregional disparities. For instance, central Africa is twelve times richer than the Sudano-Saharan subregion in freshwater resources. (See table 1 on page 365.)

Conventional freshwater sources aside, some countries, especially those in the southern, northern, and Sudano-Saharan subregions, practice reuse of treated water and desalination of seawater, albeit to a very limited extent.

Water Development and Use

Water is useful for domestic and municipal purposes: for industry, including hydropower generation, for agriculture, and for waste disposal. It plays an important role in transport, tourism, and cultural practices. Water is vital

Figure 1. Africa's Subregions



Source: Adapted from FAO–AQUASTAT (2005).

Note: Sudan and South Sudan were still one country (Sudan) in the original version of this map, from 2005. South Sudan became an independent country in July 2011.

The Food and Agricultural Organization divides Africa into seven subregions, which are shown here. The concentration in this article is on the sub-Saharan subregions.

for the survival of natural ecosystems such as forests, mangroves, and wetlands, on which many livelihoods in SSA are dependent. The higher the level of development of water resources, the more it will be available for consumption. Water development entails rainwater harvesting, diversion of river flows, and abstraction of other

surface and groundwater for domestic, industrial, and agricultural purposes. Water development thus can take the form of dam and reservoir construction for hydro-power generation and storage of water during high flow to ensure its availability in times of scarcity. Other common techniques for water development in SSA include

TABLE 1. Basic Water Data for Africa and Comparison with Europe, Asia, and the World

Continent/Region		Total Population (1,000 in habitants)	Total Area (1,000 ha)	Agricultural Sector Water Use (km ³ /year)	Municipal / Domestic Sector Water Use (km ³ /year)	Industrial Sector Water Use (km ³ /year)
Northern Africa		163,969	575,289	80	9	5
Sub-Saharan Africa	Subregions	817,158	2,429,279	105	13	4
	<i>Sudano-Sabelian</i>	127,193	859,221	52.4	2.1	0.4
	<i>Gulf of Guinea</i>	231,036	211,927	8.8	2.5	1.1
	<i>Central Africa</i>	111,587	532,868	1.1	0.7	0.2
	<i>Eastern Africa</i>	211,414	292,718	12.4	1.5	0.2
	<i>Southern Africa</i>	114,603	473,405	15.1	5.2	1.3
	<i>Indian Ocean islands</i>	21,325	59,140	14.8	0.6	0.3
Africa		981,127	3,004,568	184	21	9
Asia		4,081,022	3,241,673	2,012	217	227
Europe		732,396	2,300,711	109	61	204
World		6,741,605*	13,370,063	2,710	429	723

Source: Adapted and condensed from FAO–AQUASTAT (2010).

*Note: The world's population surpassed 7 billion in 2012.

the construction of wells, ponds, and irrigation channels and the use of wetlands and plains during flood recession.

A high level of water development contributes to positive socioeconomic development. It guarantees water availability for irrigation, for example, ensuring food security. The low level of water development in SSA nevertheless has resulted in limited availability and use, as reflected in the poor performance of key economic sectors such as agriculture and energy. According to the FAO, only 3.2 percent of all land under cultivation in SSA is irrigated, compared to 39 percent in Asia and 7.7 percent for Europe. It should be stressed here that 59 percent of the population of SSA is employed in agriculture, a value that exceeds other major regions such as Europe and Asia.

Surface irrigation is the most widespread irrigation technique used in SSA, although sprinkler techniques are also common. The International Hydropower Association notes that while Europe has developed 75 percent of its hydropower potential and Asia 22 percent, Africa has developed only 7 percent of its vast hydropower potential. According to the World Commission on Dams, Europe and Asia have about the same storage capacity, while that of SSA is less than

half that value. SSA is storing only 11 percent of its total actual renewable freshwater resources. Donor funding for large dams declined in the post-1980s because of observed socioecological impacts, which include changes in water and food security as well as disruption from construction and involuntary resettlement (WHO 2012). Smaller dams, irrigation programs, and reservoirs, mainly funded by private capital, are commonplace today. Within SSA, subregions with the least shares of freshwater resources have developed their water resources the most. Southern Africa, with 38.4 percent of continental dam capacity, is home to over 50 percent of all dams in Africa. Conversely, central Africa, the most water-rich subregion, has only 0.6 percent of Africa's dam capacity. The eastern Africa statistics underscore the importance of water development, especially storage as a coping strategy. With only 7 percent of Africa's freshwater resources and 3.4 percent of storage capacity, this subregion is prone to droughts and food crises, such as the one experienced in 2011.

By global standards, SSA accounts for the lowest per capita water use for domestic and municipal purposes. This can be traced back to the fact that more than 60 percent of Africans still live in rural areas that grossly lack access to safe drinking water and basic sanitation. In fact,

the Joint Monitoring Program of the World Health Organization (WHO) and the United Nations Children's Fund (UNICEF) asserts that 330 million people in Africa lack access to safe drinking water, and 565 million people lack access to basic sanitation. Social effects of this poor water development include malnutrition due to food insecurity and high morbidity and mortality due to waterborne diseases like diarrhea and cholera. In addition to these, lack of access to basic sanitation leads to pollution, while limited access to water sources exacerbates competition, unsustainable use patterns, and conflicts. According to the Intergovernmental Panel on Climate Change (IPCC), these socioeconomic factors will be amplified by the impacts of climate change on the quantity and quality of freshwater resources in Africa.

It is clear that water development is a prerequisite for different water uses, which in turn contribute to socioeconomic development. The questions of who uses how much water, from which source, when, and for what purpose depend on allocation of water to different users and for different purposes. Allocation of water is therefore at the core of any water rights regime because it sets priorities for water use and rights.

Role and Sources of Water Rights

In Africa, water rights take the form of formal or informal entitlements to use water from a freshwater source. When clearly defined, water rights reduce water degradation by encouraging the protection of water resources and development of water infrastructure like reservoirs, wells, or irrigation programs. Furthermore, guaranteed access to freshwater for the whole society through water rights helps to reduce conflicts and to resolve them when they occur. Water law; be it statutory, customary, or other, usually establishes water rights.

Water law in SSA has been heavily influenced by European concepts and principles as well as Islamic law,

such that today the sources of water law that establish rights, procedures to acquire these rights, and dispute resolution mechanisms include international agreements, national constitutions, statutes, regulations, orders, other administrative sources, and customary law. All co-exist, interact in space and time, and influence each other in a mix best described as legal pluralism.

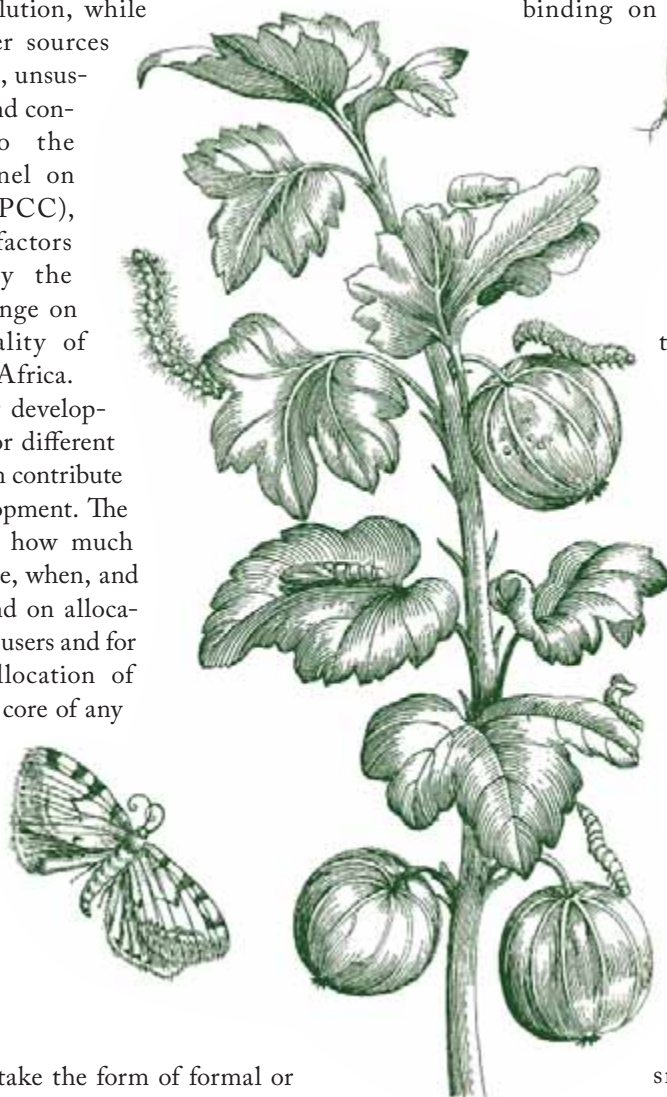
Historically, a body of unwritten but common knowledge rules and practices generally recognized as binding on members of an indigenous

group emerged in different parts of the continent. Whereas these customary water laws are not uniform, they reflect the context in which they evolved—for example, water scarcity or abundance, farming practices as opposed to pastoralist modes of life, and tenure systems. Notwithstanding variations within different groups, a number of similarities stand out. Water rights are intricately linked with land rights insofar as water is found on land. Land is the common property of the family, tribe, or village and is held in trust by the head of the family or tribal (village) chief. Water rights are thus acquired by owning a piece of land that borders a water body or by belonging to a village or other community through which a river or stream flows (Ramazzotti 1996).

Abstraction of water from small water sources (e.g., springs, streams) on family land requires the head of the family's permission.

In contrast, all members of the village, tribe, or clan are granted access to larger freshwater sources such as rivers. A point for collecting water for drinking and household needs is defined and is usually upstream from the point for bathing and for watering livestock.

In the past decades, African states have undertaken several reforms in the water sector. These reforms have mostly entailed formalizing water law and formulating explicit water rights by means of constitutional changes,



legislative acts, and administrative decisions. Key among these has been to situate water within the public domain, which is evident in water legislation in African countries. The state thus holds public rights that legitimize allocation of water and serve as the basis for regulation and control of water uses and users and for adjudication in times of dispute. Ghana's Water Resources Commission Act of 1996, for instance, states that water resources are vested in the president of the state on behalf of and in trust for the people. In Uganda's Water Resources Act of 1995, water resources are placed under the superior use right of the state.

In some countries, water rights are part of basic rights as expressed in the national constitutions. The 1996 Constitution of the Republic of South Africa explicitly recognizes the fundamental right of access to sufficient food and water. Thirty-seven countries in SSA presently have a water code or act, while others such as Sudan and Gabon deal with water-related issues as part of environmental and natural resources legislation. In others, such as the Democratic Republic of the Congo and Swaziland, water rights and related issues can be found in regulations. Sierra Leone, Somalia, and a few others lack specific water laws but have administrative water management bodies in place.

Overall, government agencies are responsible for the implementation and administration of statutory and administrative water rights in African countries. For instance, Cameroon's Water Code of 1998 established the National Water Committee as an institution within the Ministry of Water Resources.

The predominantly transboundary nature of its freshwater basins complicates water law in Africa. In this regard, countries are adopting the 1992 Dublin Principles and Integrated Water Resources Management as the standard for managing freshwater basins across the continent. Moreover, other international norms enshrined in global treaties such as the 1997 United Nations Convention on the Law of the Non-navigable Uses of International Watercourses are being applied in sharing Africa's transboundary rivers. A good example of this is the adoption of the principle of *equitable and reasonable use* in the River Nile Co-operative Framework Agreement of 2010, which is an attempt to replace the colonial Nile Water Agreements of 1929 and 1959. The latter agreements provide for water allocations only to Egypt and Sudan and give Egypt veto power on water development projects upstream.

Water Rights Types and Features

The types of water rights are as diverse as the water laws that establish them. Customary water law in Africa

generates communal water rights, while statutory water law generates public and private water rights.

Water is treated in African customary law as common property of the clan, village, or community. Local norms and traditions thus legitimize ensuing communal water rights. Customary water law thus equally establishes decision-making processes for access rights, in this case communal water rights and obligations. Communal water rights establish clear rules on local water use for household, irrigation, livestock, and other needs. These rights are not static; rather, they are adaptable to times of water scarcity and other local socioeconomic realities. Communal water rights do not specify what quantity of water each individual is entitled to have. Instead, members of the community collect as much water as needed while ensuring there is sufficient water left for everyone else. Right holders may not exclude other rightful users from the resource, and everyone has the responsibility of protecting and maintaining it. Users may contribute in labor or money. The family head or the clan or village council or chief, as the case may, resolves disputes. Rule violations are punished by fines payable to a local authority, such as a chief. Communal rights are transferred through lineage from one generation to another.

The second type of water rights observed across Africa is the public water right. Such rights emanate from the nature of water as a public good in water legislation of most African countries. Public water rights are held by the state in trust for its citizens. An important feature of public water rights lies in their disentanglement from land rights. Noteworthy is the fact that in most African countries, everyone has a right to access water for basic household needs. For example, a primary goal of Uganda's Water Statute is to promote the provision of a clean, safe, and sufficient supply of water for domestic purposes to everyone; Nigeria's 1993 Water Resources Decree declares that all may take water without charge for domestic purposes or for watering stock from any water source to which the public has free access. The definition of what constitutes basic needs varies from country to country. Section 2 of Uganda's Water Statute, for example, defines domestic use as water for basic human consumption; watering up to thirty livestock units (amounting to forty-three cattle or fifty horses or seventy-five donkeys or two hundred goats or two hundred sheep or a mixture of these); for subsistence agriculture; and for watering subsistence fishponds.

Third, African governments are increasingly issuing private water rights to individuals, through designated water authorities, for purposes other than personal and household needs. These rights are required for water used

for commercial purposes and large-scale irrigation strategies and for discharging wastewater into freshwater bodies, as exemplified in the water codes of Cameroon, Nigeria, and South Africa. Individuals or corporations can hold private water rights and obtain them from the state by acquiring a license, permit, lease, concession, permission, authorization, or other title at a fee and for a fixed number of years. Private rights are not land based, but specify the volume of water associated with the entitlement, the purpose of use, and conditions associated with the right. In the case of discharge of wastewater, for instance, the right specifies the point at which the wastewater may be released. Such rights are use or usufructuary rights rather than ownership rights. Based on the conditions to which private rights are subject, they can be sold, leased, or transferred to other users. In this sense, these rights are a form of property rights.

Private rights are arguably more secure when their duration of validity is long. This outlook, alongside economic thinking that profit improves efficiency, led to the privatization of water utilities in much of Africa in the 1990s. A serious challenge in Africa therefore is to reconcile water as both an economic and public good. Failure to do this will jeopardize efforts geared at meeting the United Nations' Millennium Development Goals target of halving the number of people without sustainable access to safe drinking water and basic sanitation by 2015. African states' failure to guarantee access to water for basic human needs violates international norms such as the 1996 International Covenant on Economic, Social and Cultural Rights (ICESCR), which recognizes the right to an adequate standard of living including food and physical health. These norms imply a human right to water, as the 2002 General Comment number 15 of the United Nations Committee on Economic, Social and Cultural Rights demonstrates.

Trends, Future Perspectives, and Challenges

The total annual water use in Africa is on the increase. Although agriculture still takes up the largest share, increases in population and rapid urbanization are also contributing factors. The United Nations Economic

Commission for Africa estimates that some eighteen African countries will experience water stress by 2025. To meet the water demands for food security and human needs, hydropower generation, and industry, the African Water Vision estimates an

increase in water development by 25 percent by the year 2025. Unconventional methods such as interbasin water transfers, already seen today in the southern region, could become commonplace.

Formalization and introduction of private rights notwithstanding, water use in Africa remains principally a matter regulated by customary law. Africa still has a large rural population, and access rights in rural settings are based on customary practices. Procedures for the acquisition of formal water rights are cumbersome and costly, such that only corporations and individuals who can command the necessary resources can obtain such water rights. The legal status of customary water law in African statutory water law therefore is not always clear. In practice, formal water rights can be defended in court and hence can override communal rights should a conflict between the two arise. Reconciling customary law with statutory law remains a central challenge in ensuring water rights of local communities.

J. Manyitabot TAKANG
University of Cologne

See also Africa (*several regions*); African Union (AU); Agriculture, Small-Scale; Congo (Zaire) River; Desertification (Africa); Disaster Risk Management; International Conflict Resolution; Lake Chad; Nile River; Rule of Law (Africa); Sahara; Sahel; Transboundary Water Issues; Water Use and Rights (Middle East and North Africa)

FURTHER READING

- Burchi, Stefano. (2005). The interface between customary and statutory water rights: A statutory perspective (Food and Agriculture Organization Legal Papers Online No. 45). Retrieved May 25, 2012, from <http://www.fao.org/legal/prs-ol/lpo45.pdf>
- Center for Research on the Epidemiology of Disasters (CRED). (2009). EM-DAT: The OFDA/CRED international disaster database. Université Catholique de Louvain-Brussels-Belgium. Retrieved November 3, 2011, from <http://www.emdat.be/database>
- Food and Agriculture Organization of the United Nations (FAO). (2003). Review of world water resources by country (FAO water



- reports 23). Retrieved August 26, 2011, from <ftp://ftp.fao.org/agl/aglw/docs/wr23e.pdf>
- Food and Agriculture Organization of the United Nations (FAO). (2004). FAOLEX legislative database. Retrieved November 3, 2011, from <http://faolex.fao.org/faolex/>
- Food and Agriculture Organization of the United Nations (FAO) AQUASTAT. (2005). Irrigation in Africa in figures: AQUASTAT Survey 2005. Retrieved May 31, 2012, from http://www.fao.org/nr/water/aquastat/countries_regions/africa/figurescontinent.pdf#fig6
- Food and Agriculture Organization of the United Nations (FAO) AQUASTAT. (2010). Population, areas, gross domestic product (GDP) (2008). Retrieved May 31, 2012, from http://www.fao.org/nr/water/aquastat/dbase/AquastatWorldDataEng_20101129.pdf
- Food and Agriculture Organization of the United Nations (FAO) AQUASTAT. (2011). AQUASTAT: FAO's information system on water and agriculture. Retrieved November 3, 2011, from <http://www.fao.org/nr/water/aquastat/main/index.stm>
- Frenken, Karen. (Ed.). (2005). Irrigation in Africa in figures: AQUASTAT survey—2005. (FAO water reports 29). Food and Agriculture Organization of the United Nations (FAO). Retrieved July 28, 2011, from ftp://ftp.fao.org/agl/aglw/docs/wr29_eng.pdf
- Global Water Partnership. (n.d.). Retrieved May 25, 2012, from http://www.gwptoolbox.org/index.php?option=com_content&view=article&id=8&Itemid=3
- Hodgson, Stephen. (2006). *Modern water rights: Theory and practice; FAO Legislative Study 92*. Rome: Food and Agricultural Organization of the United Nations. Retrieved May 20, 2012, from <ftp://ftp.fao.org/docrep/fao/010/a0864e/a0864e00.pdf>
- International Hydropower Association (IHA). (2003). *The role of hydropower in sustainable development* (IHA white paper). Retrieved July 30, 2011, from <http://www.carbosur.com.uy/archivos/Hydropower%20in%20sustainable%20world,%20IHA%20white%20paper,%202003.pdf>
- International Water Law Project. (2010). Agreement on the Nile River Basin cooperative framework. Retrieved May 25, 2012, from http://www.internationalwaterlaw.org/documents/regionaldocs/Nile_River_Basin_Cooperative_Framework_2010.pdf
- Kundzewicz, Zbigniew W., et al. (2007). Freshwater resources and their management. Climate Change 2007: Impacts, Adaptation and Vulnerability In: M. L. Parry, O. F. Canziani, J. P. Palutikof, P. J. van der Linden & C. E. Hanson (Eds.), *Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change* (pp. 173–210). Cambridge, UK: Cambridge University Press.
- Meinzen-Dick, Ruth, & Nkonya, Leticia. (2005, January 26–28). Understanding legal pluralism in water rights: Lessons from Africa and Asia (Paper presented at the international workshop “African water laws: Plural legislative frameworks for rural water management in Africa”). Johannesburg, South Africa. Retrieved March 20, 2012, from <http://www.nri.org/projects/waterlaw/AWLworkshop/MEINZEN-DICK-R.pdf>
- Mensah, Kwadwo. (1999). Water law, water rights and water supply (Africa). Ghana: Study country report (DFID KaR Project R7327). Cranfield University Silsoe, UK Department for International Development (DFID). Retrieved May 20, 2012, from <http://allafrica.com/download/resource/main/main/0010041:6ab9fe24570074a47d2595d7b8d0be3a.pdf>
- National Environmental Authority (NEMA–Uganda). (1995). Uganda Water Act. Retrieved May 25, 2012, from http://www.nemaug.org/regulations/water_act.pdf
- The Nile Basin Initiative. (n.d.) Homepage. Retrieved May 25, 2012, from <http://www.nilebasin.org/newsite/>
- Obitre-Gama, Judy. (1999). Water law, water rights and water supply (Africa). Uganda: Study country report. (DFID KaR Project R7327). Cranfield University Silsoe, UK Department for International Development (DFID). Retrieved July 20, 2011, from <http://www.dfid.gov.uk/r4d/PDF/Outputs/R73275.pdf>
- Pachauri, Rajendra K.; Reisinger, Andy; & Synthesis Report core writing team. (Eds.). (2007). Climate change 2007: Synthesis report. Contribution of Working Groups I, II and III to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC). Geneva: Intergovernmental Panel on Climate Change (IPCC).
- Pradham, Rajendra, & Meinzen-Dick, Ruth. (2010). Which rights are right? Water rights, culture, and underlying values. In Peter G. Brown & Jeremy J. Schmidt (Eds.), *Water ethics: Foundational readings for students and professionals*. Washington, DC; Covelo, CA; London: Island Press.
- Ramazzotti, Marco. (1996). *Readings in African customary water law*. (FAO Legislative Study 58). Rome: Food and Agriculture Organization of the United Nations (FAO).
- Ramazzotti, Marco. (2008). Customary water rights and contemporary water legislation: Mapping out the interface (FAO legal papers online, No 76). Retrieved May 25, 2012, from <http://www.fao.org/legal/prs-ol/lpo76.pdf>
- Republic of Ghana. (1996). Water Resources Commission Act (Act 522). Retrieved May 25, 2012, from <http://www.epa.gov.gh/ghanalex/acts/Acts/WATER%20RESOURCE%20COMMISSION%20ACT1996.pdf>
- Republic of South Africa. (1996). Constitution of the Republic of South Africa, 1996. Retrieved May 22, 2012, from <http://www.info.gov.za/documents/constitution/1996/index.htm>
- Republic of South Africa. (1998). National Water Act. (Act No 36 of 1998). Retrieved May 22, 2012, from <http://www.dwaf.gov.za/IO/Docs/nwa.pdf>
- Scanlon, John; Cassar, Angela; & Nemes, Noémi. (2004). *Water as a human right?* Gland, Switzerland, & Cambridge, UK: IUCN.
- Scott, Anthony, & Coustalin, Georgina. (1995). The evolution of water rights. *Natural Resources Journal*, 35(4), 821–979. Retrieved July 28, 2011, from http://lawlibrary.unm.edu/nrj/35/4/05_scott_evolution.pdf
- Shiklomanov, Igor A. (2000). Appraisal and assessment of world water resources. *Water International*, 25(1), 11–32.
- Smets, Henry. (2000). The right to water as a human right. *Environmental Policy and Law*, 30(5), 249.
- United Nations Committee on Economic, Social and Cultural Rights (CESCR). (2002). General comment No. 15 on the International Covenant on Economic, Social and Cultural Rights (on the Right to Water). Retrieved April 20, 2012, from [http://www.unhcr.ch/tbs/doc.nsf/0/a5458d1d1bbd713fc1256cc400389e94/\\$FILE/G0340229.pdf](http://www.unhcr.ch/tbs/doc.nsf/0/a5458d1d1bbd713fc1256cc400389e94/$FILE/G0340229.pdf)
- United Nations Development Programme (UNDP). (2006). Human development report 2006: Beyond scarcity: Power, poverty and the global water crisis. New York: Palgrave Macmillan for UNDP.
- United Nations Economic Commission for Africa (UNECA). (n.d.). The Africa water vision for 2025: Equitable and sustainable use of water for socioeconomic development. Retrieved August 5, 2011, from <http://www.uneca.org/awich/african%20water%20vision%202025.pdf>
- United Nations Economic Commission for Africa (UNECA). (2000). Transboundary river/lake basin water development in Africa: Prospects, problems, and achievements. Retrieved July 22, 2011, from http://www.uneca.org/awich/Reports/Transboundary_v2.pdf
- United Nations Educational, Scientific, and Cultural Organization (UNESCO). (2003). *The United Nations world water development report: Water for people, water for life*. Paris: UNESCO.
- United Nations Educational, Scientific, and Cultural Organization–World Water Assessment Programme (UNESCO-WWAP). (2006). *The United Nations World Water Development report 2: Water a shared responsibility*. Paris: UNESCO.

- United Nations Environment Programme (UNEP). (2000). Global environment outlook 2000 (GEO-2000). Retrieved August 5, 2011, from <http://www.unep.org/GEO2000/index.htm>
- UN-Water/Africa. (2003). African water journal: Pilot edition. *United Nations Economic Commission for Africa*. Retrieved July 24, 2011, from http://www.uneca.org/sdd/African_Water_Journal_rev.pdf
- White, W. R. (2010). World water: Resources, usage and the role of man-made reservoirs. *Foundation for Water Research*. Retrieved August 2, 2011, from <http://www.fwr.org/wwtrstrg.pdf>
- World Commission on Dams (WCD). (2000). Dams and development: A new framework for decision-making. (The report of the World Commission on Dams). London; Sterling, VA: Earthscan. Retrieved August 26, 2011, from http://www.internationalrivers.org/files/world_commission_on_dams_final_report.pdf
- World Health Organization (WHO). (2012). Health and social impacts of dams. Retrieved June 29, 2012, from <http://www.who.int/hia/examples/energy/whohia020/en/index.html>
- World Health Organization (WHO), & United Nations Children's Fund (UNICEF). (2010). Progress on sanitation and drinking water: 2010 update. WHO/UNICEF Joint Monitoring Programme for Water Supply and Sanitation (JMP). Retrieved August 3, 2011, from http://whqlibdoc.who.int/publications/2010/9789241563956_eng_full_text.pdf
- World Health Organization (WHO), & UN-Water. (2010). UN-Water global annual assessment of sanitation and drinking-water (GLAAS) 2010: Targeting resources for better results. WHO/UNICEF Joint Monitoring Programme for Water Supply and Sanitation (JMP). Retrieved August 8, 2011, from http://www.who.int/water_sanitation_health/publications/UN-Water_GLAAS_2010_Report.pdf
- World Wide Fund for Nature (WWF). (2007). Allocating scarce water: A WWF primer on water allocation, water rights and water markets. Gland, Switzerland: WWF.

