IRC

Managing Water in African Cities:
Developing e-mail and Internet tools

This paper addresses how to develop the functions and features of electronic mail and a web domain to help African water managers to, for example, write up a project document, tender for bids, finance local initiatives or replicate promising management practice. Practitioners at city level may refer to this paper when voicing their needs for Internet tools that are of use to them. In the annexes, more detailed information is provided on: Existing access to Internet in Africa; Relevant Global water Partnership Associated Programmes; InterWATER African organizations..

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IRC International Water & Sanitation Centre
March 2000

Introduction

In African cities, managers are increasingly called upon to develop and adopt innovative practices to manage their water resources equitably and efficiently, and cut the discharge of waste into freshwater bodies.

To help them do so the **Managing Water for African Cities** programme will enable practitioners, managers and researchers to share knowledge using, among other things, an interactive web domain. The universal reference link (URL) is:

http://www.un-urbanwater.net

Why develop a dedicated web domain?
Tthe number of publicly accessible pages on the World-Wide Web has recently surpassed one billion pages and are increasing at an explosive rate; but search engines now index less than 50 percent of them and only about 6 percent of web servers have scientific and educational content. [1]

The six major public search engines[2] are increasingly falling behind to index the web. In 1997 they collectively covered about 60 percent of the web; in early 1999 they estimate it had dropped to 42 percent of the estimated total number of pages.

A dedicated web domain provides a community of professionals with a specialised platform to start their search on the web.

Servicing managers in African cities

There are three categories of possible functions and features ranging from being very interactive to consultative in nature. In the first case they are inherently supply-led and in the second case more demand-driven i.e. they differ in their responsiveness to the expressed needs of user groups. These functions and features contribute to the make up of an *information clearing house.*

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[1] This was announced recently by the renowned US research institutes Inktomi and NEC Research Institute. In February 1999 the counter stopped at 800 million indexable pages (Lawrence and Giles 1999). The researchers crawled all the pages on a random sample of 2500 web servers out of an estimated 2.8 million web servers at that time

[2] The six major public search engines that rank highest on the top ten used by consumers, scientists, journalist are Alta Vista, Excite, Hotbot, Infoseek, Lycos and Northern Light. About 85 percent of Internet users use search engines to locate this information

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Interactive

- *Listserver* where members can post a message or put a question to a forum where members can read and post email messages. A good example is the water-and-san-applied-research listserver (http://www.mailbase.ac.uk/) that also has a digest of discussions on the mailing list and its archives.

- *On line chatting* through ICQ which allows people who are *on line* to exchange short messages in real time (much like a writing out a telephone call, but at a fraction of the telephone cost) ;

- *Question and answer service* (Q&A). Practitioners submit by email to a resource centre a question and within a few days, receive, an answer tailored to their specific query.

- *Tele consulting:* users contact and contract an expert and obtain advice by telephone having perhaps previously exchanged working document by email.

Water & Sanitation Think Tank
http://www.oneworl.net/thinktank/water

OneWorld Europe and partners (World Bank, GARNET, IRC, WaterAid) have launched a Think Tank on Water and Sanitation pilot project combines four **moderated and e-mail conferences and web archive**. These are guided and stimulated by a content facilitator and usually lasts no more than four to six weeks. There is a web site with full text material on the topic of discussion. Also, partners in the developing world share printouts with their local partners and organize offline workshops with stakeholders to feed the views form the field into the electronic discussion. Plans are to build capacities of local partners to run these e-conferences and web site themselves. In the third email conference on Small Town water and Sanitation, CINARA, a resource centre in Colombia is organizing the first parallel electron conference in Spanish.

Search and referral

- *Frequently asked questions*
  A set of predefined question and their answers are posted on a web page for everyone to consult. They are based on previous contact with

- *Searchable on line databases*
  such as contribute a case/best practice, on the web site through a given format like for example the UNCHS (Habitat) database of best practices or IRCDOC (http://www.irc.nl/ircdoc);

Consultative

- *On line full text* documents like publications, newsletter, articles or a list of suggested selected readings ;

- *Internet links* (URLs) to relevant web sites.

Learning from existing clearing house experiences

Internet use has been in operation in the water sector since 1995. With many organizations, the first effort consisted mainly of putting the company brochure on the web, rather than thinking about content of interest to clients.

Among the lessons learned are: regular updating the pages, validation of content, combining e-mail/Internet with hard copy dissemination, and the need for capacity building.

Regular updating takes time

To update a web page every week and adding new content requires a full time web manager.

The links to more than 500 agencies on the InterWATER.gateway are updated regularly: http://www.wsscc.org/interwater

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Validation of content

Compilation and validation of web information and especially best practices and case studies is can be costly. This can be demonstrated with the following examples:

- The Advocacy and Communication Working Group of the WSSCC has contracted a consultant to compile 8 case studies.

- The WSSCC web site: a consultant has been working months to collect country information, projects, and lessons learned.

- GESI web page and Environmental Sanitation Working Group: http://www.wsscc.org/gesi. The GESI tools and publications section contains summaries of some 20 consolidated case studies of UNICEF supported programmes that were discussed at a four day workshop.

- The Council's Environmental Sanitation Working Group is tasked with validating technologies/case studies, but has not been able to allocate sufficient time for that.

- The establishment of the Netherlands Water Partnership http://www.nwp.nl "the Dutch Blue Window" on the Web that is providing the transfer point between any water question from abroad with Dutch water expertise is budgeted to cost US$ 80,000.

Expectations that high quality, targeted information products and services on the Internet can make money are difficult to fulfil.

Combine e-mail/Internet with hard copy dissemination

Combining of Internet/e-mail with paper copies is essential to make the information gap between Internet "haves" and the "have nots" smaller.

That is the experience of the last three years with IRC and the family of web sites it developed in collaboration with WSSCC and GARNET. The Source Water and Sanitation News Service that was established in late 1998 has now 1300 subscribers to the electronic Source Weekly. The bi-monthly Source Bulletin subscribers by e-mail are nearing a 1000. The number of subscribers to the paper version (that includes news from the web pages) is 4940, the majority of them live in the developing world. The average hits per week (page views) on Source web site increased from 488 in Jan-March to 654 in Oct-Dec 1999.

Capacity building

Based on previous experience [3] most organisational in developing countries partners have only recently been equipped with e-mail facilities that sometimes fail. Those that have a web sites on line comprise mainly of their company brochure and is not user oriented. Most of the time interesting content on information products and services is lacking, so is the capacity to search, filter, find and retrieve relevant information.

There is an obvious need to build capacity on writing for the Internet, how to use electronic discussion lists and how to search Internet.

Next steps to develop web-based products and services

From the issues raised above emerges a checklist that could be the basis for action

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[3] Similar lessons emerged from the joint leaning projects in which developing country partners and IRC are working together: Dissemination of four years of participatory action research on Community Water Management in six countries, and the Streams of knowledge coalition of resource centres.

by local resource centres, possibly as part of the MAWAC initiative . Some of the immediate tasks include :

1. Survey information needs of users at city level and

2. Map potential Internet support programmes and resources that can cooperate with and contribute to the MAWAC programme.

3. Formulate a financial plan detailing costs;

4. Set up computer and communication facilities ;

5. Train staff and information specialists ;

6. Test the first mix of web- based and non web-based products/services.

The Committee on Development Information of Economic Commission for Africa summarised the general situation as follows[4]:

"To make the most effective use of Internet content, users must know where to find the information they need. With the explosive growth of information sources, the need for directories and clearinghouses has become significant. A consolidated and evaluated knowledge base (meta information) on scientific and technical content in Africa is paramount.

In addition, there is a need for efforts to :

♦ train users in Web site development not only the technical aspects, which have been given priority in the past, but also the aesthetic ones and approaches to defining user needs;

♦ provide support for the creation and recognition of sites which are useful for development, e.g. [http://www.piac.org];

♦ access national and international information sources on a regular basis so as to provide tips and guidelines to users;

♦ establish content building service centres at local levels, or encourage the private sector to build them, to provide site development advice to small and medium-scale organizations especially for electronic commerce sites to take the lead;

♦ establish systems and institutions to build tools that address the many languages of Africa; and

♦ support and train information brokers such as librarians to act as intermediaries between information sources and the knowledge base, and to develop diverse techniques that address information access to the disadvantaged and the disabled.

These recommendations point to a two-pronged approach to African content development. In the private and business sphere, a web presence involving global inter-linkage and accessibility will lead to a significant increase of African content.

On the other hand, for such content to take hold, governments must create enabling regulatory, legal and policy frameworks to protect security, privacy and copyright ownership, and must encourage accessibility and competition at affordable prices. Such environments will facilitate partnerships between all stakeholders – NGO activists, academics, ICT specialists, the media, brokers, consumers and publishers".

References

Adam L., Connectivity and access for scientific communication and +publishing in Africa, in: FID Review, Vol. 1, No 2/3 1999

Lawrence, S. and Giles C.L., Accessibility of information on the web. in: Nature, Vol. 400, 8 July 1999

SAWINET
http://www.gtz.de/gwpgtz/ stands for Southern African Water Information Network.

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[4] Ref:
http://www.un.org/Depts/eca/adf/codipap3.htm

Annex 1
Existing access to Internet in Africa

The number of publicly accessible World-Wide Web has recently surpassed one billion pages. This was announced recently by the renowned US research institutes Inktomi and NEC Research Institute. In February 1999 the counter stopped at 800 million indexable pages (Lawrence and Giles 1999). The researchers crawled all the pages on a random sample of 2500 web servers out of an estimated 2.8 million web servers at that time. About 83 percent of servers contain commercial content. About 6 percent of web servers have scientific and educational content, they reported in Nature in July.

However, access to the web in Africa still very much lags behind. The penetration of computers has reached about 1 PC for every 300 Africans, but 286 DOS machines are still in use in many parts of Africa, Lishan Adam, regional advisor on information technology and connectivity at the Economic Commission for Africa (ECA) reported in the last FID Review of 1999 (Adam, 1999). "Africa has the least developed ICT infrastructure with only 2 percent of the word's telephone lines". Manhattan has more telephone lines than the whole of sub-Saharan Africa. Many African scholars are unable to afford access to the latest information and communication technologies (PCs, networks, communication channels, bandwidth etc.). A typical monthly salary of a researcher is 1/10 of the cost of a computer or equivalent to a monthly charge for Internet access. In Angola and Gabon Internet access can cost US$ 14 per hour. Access for 30 hours in these countries costs more than a monthly researcher's salary. At institutional level computer access is often confined to a director, avid researchers and post graduate students.

The highest number of Internet users in Africa work in non-governmental organizations (NGO) and the private sector and over 90 percent had university degrees, a recent survey by the ECA shows (ECA, Impact of Electronic Networking in Africa, http://wwwun.org.depts/eca).

On the positive side, Internet connectivity has been spreading throughout the African continent. In 1995 only four countries had direct links to the Internet. Now 50 countries have direct Internet connections to their capital cities. The only nations that have no connectivity are Eritrea, Somalia and Republic of Congo. Some countries including Angola, Benin, Botswana, Ghana, Kenya, Mozambique, Namibia, South Africa and Tanzania have provided Internet presence in secondary cities. Others maintain local dial-up tariffs for calls from long distance within the country.

Still a major problem is access to sufficient international bandwidth that makes interactive Internet activities possible. The majority of the countries connect with less than 64 kilobytes per second (Kbps), except Egypt, Kenya, Morocco, Namibia, Senegal South Africa and Tanzania that have higher connection speeds. But except South Africa, Tunisia and Egypt the African countries do not have the bandwidth to provide and access multimedia and interactive web sites. As a result the majority of the web sites on Africa are now being hosted by internet service providers (ISP) in North America and some in Europe. Regiobal backbones or links to neighbouring countries are also very rare. Africa's Internet connectivity to the outside world is dominated by five ISP: Alter.net, MCI, Sprint, the Verio group and Teleglobe.

By the end of 1998 the number of Internet users was well over 700,000, or 1 to 1000 Africans, close to 90 percent of them South Africans. Of the 428,000 dial-up accounts, 178,000 are outside of South Africa.

For a good overview about the Barriers to Internet and content development on/from Africa the ECA paper Content Creation and Dissemination paper of July 1999 http://www.un.org/Depts/eca/adf/codipap3.htm in Table 1shows a summary in the following categories: economic, technical, infrastructural, and political and regulatory.

Table 1. Barriers to Internet and Content development in Africa[5]

Economic	Technical	Infrastructural	Political
High cost thus limited use of ICTs to increase access to education, promotion of health, agriculture, commerce, environment, tourism and culture	Non-available interfaces to diverse local languages	Few experts with knowledge of advanced tools such as Unix, Java, dynamic databases, etc.	Lack of enabling regulatory environment
Non-availability of local information content and tools for communities			High tariffs on the ICT tools
Inadequate private sector involvement in Internet and Intranet building	Lack of African IP registry – a center that administers IP addresses and autonomous system numbers and continent wide directory services	Limited network supportive infrastructure development in sub-urban and rural areas	
	Lack of peering among national Internet Service Providers to reduce costs and maximize bandwidth use	Lack of national inventories, data bases on what is possible, and organized groups that support growth of Internet	Delays in obtaining license for spread frequency spectrum
	Non-availability of tools that can be used as low cost offline solutions	Limited technical assistance in improving bandwidth	Conflict between existing laws and those for development of the Internet
			Inadequate legal and intellectual property rights for local innovations and cultural heritage
			Inadequate policies to balance between public and private ownership, local resources and foreign direct investment, monopoly and competition in communication and value added services.

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[5] Based on Mike Jensen survey (http://www3.wn.apc.org/africa/

Efforts to improve access to relevant content on the web

The spectacular growing Internet content has for 85 percent occurred in ten developed countries. Africa's share of Internet hosts has been declining since 1995, according to a recent survey by Network Wizards. **There are about 150,000 Internet sites providing content, of which 95 percent are in South Africa**. This is a sign of the lack of African capacity for generating content. Capacity of African resource centres that the MAWAC e-mail discussion list and web site is helping to develop.

ECA's Lihan Adam feels that the picture is slowly but steadily improving. "Nearly all African countries have some form of locally or internationally hosted web server, unofficially or officially representing the country with varying degrees of comprehensiveness". A large portion of African Internet content is business information about institutional activities, products and services and news. Subject areas covered are diverse and are getting increasingly more difficult to categorize. Two specialized "Africa" web search engines have emerged recently, Woyaa at http://www.woyaa.com and Orientation Africa at http://af.orientation.com.

Information & the Water Sector: An international initiative.

The International Federation for Information and Documentation, FID is one of the leading international, non-governmental Organizations concerned with information and documentation activities worldwide. For more than 100 years, FID has worked to develop information and documentation techniques and services and to promote the interests of information specialists and users around the world. Through the activities of its international committees and special interest groups, FID is able to maintain and develop its global network of information professionals. In collaboration with the International Water and Sanitation Centre, IRC, FID will publish a special double issue of its membership journal, the FID Review, on 'Key Issues in Water Information' in April 2000. The double issue will feature over 16 peer-reviewed papers from information professionals who are active in the world's leading institutions in the water sector.

Other good news comes from the language front. Initially, English speaking countries dominated African content. A recent project of the international francophone organization La Francophonie supported by the French and Quebec governments, has substantially increased the quantity of web-based information available on French speaking African counties. The project provides web servers and support at ministerial level to Benin, Burkina Faso, Cameroon, Cote d'Ivoire, Madagascar, Mali, Mauritius, Mauritania and Senegal. It also provides also training and support for 20 web site builders from organizations in Benin, Burkina Faso, Cote d'Ivoire, Mali and Senegal. This is also reaching the water sector. The Office International de le'Eau with help of La Francophonie is assisting CREPA in Burkina Faso in its web development on appropriate technology in water and sanitation

The Banque Internationale d'Information sur les Etats Francophone also plans to establish web servers in Benin, Tunisia, Mauritius and Morocco. As a result the **French speaking african countries have a far higher profile on the Web** and greater institutional connectivity that the non-French speaking countries (Mike Jensen's connectivity site:http://www3.wn.apc.org/africa/afstat.htm).

The African Information Society Initiative (AISI) is working on 'African Connection, an African Telecommunications infrastructure project. This is part of the framework with a few proposed projects of AISA that was endorsed by heads of State, and conferences of telecommunication ministers, economic planning and various international forums for Africa. AISA calls for development of national information structure plans based on national development goals and to share the success of other countries' experience.

A few more water-related African initiatives that MAWAC could also contribute to and benefit from include:

- The Water and Sanitation Africa Initiative's African of the WSSCC that following its Forum in Abidjan, Cote d'Ivoire in November 1998 has a mandate supported by a decision of the Organization of African Unity (OAU) to coordinate the many water supply and sanitation initiatives in Africa and to provide a focal point for networking on key issues. The Africa Water web page by Len Abrams is/will be hosting the

WASAI web site. More than 200 WSSCC members have indicated that they want to be part of the WASAI network.

- The Regional Technical Advisory Committees that the Global Water Partnership has established in West Africa, East Africa and Southern Africa to coordinate technical support to integrated fresh water resources management in the countries of those regions. One of its activities is the Southern African Water Information Network (SAWINET)

SAWINET

SAWINET is an Information Network on Integrated Water Resources Management. SAWINET is meant to support the prevention of future conflicts over water. The content of SAWINET focuses on three cross sectoral issues to start with: water policy and legislation, valuation of water in alternative use contexts and institutional development. SAWINET is presently developed in cooperation with the Southern African Technical Advisory Committee in Harare, Zimbabwe and in cooperation with the SADC Water Sector Coordination Unit in Maseru/Lesotho. It is funded by the German Federal Ministry for Economic Cooperation and Development (BMZ) and implemented by the German Agency for Technical Cooperation (GTZ), with the support of the Global Runoff Data Centre (GRDC) at the Federal Institute of Hydrology.
SAWINET http://www.gtz.de/gwpgtz/

Other relevant GWP supported water and sanitation programmes are listed in annex 1. Other relevant sources of information on Africa water and sanitation can be found at the interWATER web site: http://www.wsscc.org/interwater/africa.html and annex 2.

Annex 2
GWP Associated Programmes

http://www.gwpforum.org/#AP

The Global Water Partnership has a number of associated programmes relevant to MAWAC. Associated Programmes (APs) are operational, autonomous programmes providing services on the ground. The objective shared by all APs is to assist in solving problems encountered by stakeholders in water resources management.

The GWP portfolio of APs constitutes the "business units" of the Partnership. The APs may have different organisational structures as well as different lifetimes. This depends on the type of services provided and the geographical coverage. However, the common mode of operation is to pool the best knowledge available within the Partnership and to package it into services that meet demand of the regions.

Priority areas to be addressed in order to improve the overall management of water resources at a global level are: Integrated Water Resources Management (IWRM) : Water and Nature , Water for People , Water for Food

The APs include a number of newly developed programmes, as well as some "adopted" programmes that were already operational outside GWP. Among the newly developed APs are:

IWRM information network - SAWINET
Region: Southern Africa
Driver: GTZ

The information system on IWRM is in the development phase. Funded by the German Federal Ministry for Economic Cooperation and Development (BMZ) and implemented by the German Agency for Technical Cooperation (GTZ), the initiative has developed a prototype website and initiated a pilot study with SATAC (GWP Southern African Technical Advisory Committee), the Southern African Water Information Network (SAWINET).

IWRM Capacity Building - CAPNET
Region: Global
Driver: UNDP/IHE

CAPNET fosters human resources development for IWRM. It focuses on education, training and applied research, and encourages partnerships and networking at national, regional and global levels.

Water Conservation for Agriculture (WCA) - INFONET
Region: Global
Driver: IPTRID

This is a dedicated information service for water conservation and use in agriculture (WCA INFONET). The service, now in the initial development phase, will select, review, and deliver carefully targeted quality-controlled information from an international network of partners. The information will include synthesised knowledge and capacity building information in WCA, in particular and sustainable food production. The initiative is funded by DFID.

Waternet
Region: Southern Africa
Driver: University of Zimbabwe

WaterNet is a regional programme to build and strengthen regional capacity for the integrated management of water resources in the Southern African region through education, training and research. WaterNet started its activities in September 1999.

Adopted programmes are:

World Bank/UNDP Water and Sanitation Program, (WSP)
Region: Global & Regional
Driver: WSP

WSP Africa
WSP Andes
WSP South Asia
WSP East Asia

Water Utility Partnership, WUP, Programme Region: Southern and West Africa, Mediterranean
Driver: WUP
The major objective of the Programme is to increase coverage of water supply and sanitation services and improve their quality through more investments and reform of utilities. It aims to bring together all utilities, service providers and collaborators in the water supply and sanitation sector in Africa.

ANNEX 3
INTERWATER AFRICAN ORGANIZATIONS

Burkina Faso

CEFOC (Centre de Formation Continue EIER - ETSHER)
01 BP 594, Ouagadougu 01 - Burkina Faso
Tel: +226 319225/18/03/04
Fax: +226 319226
Email: etsher@fasonet.bf
See also: Site Web à Paris

CREPA (Centre Régional pour l'Eau Potable et l'Assainissement à faible coût)
03 BP 7112
Ouagadougou 03
Burkina Faso
Tel: +226 31 03 59 / 60
Fax: +226 31 03 61
Email: crepa@fasonet.bf
See also: Training and professional development activities
See also: GARNET Topic Network: Iron & Manganese Removal

Ecole Inter Etats d'Ingénieurs de l'Equipement Rural (EIER)
03 BP 7023 Ouagadougou 03, Burkina Faso
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Ecole Inter Etats des Techniciens ETSHER (Supérieurs de L'Hydraulique et de L'Equipement Rural)
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Tel: +226 319203 / 04
Fax: +226 314093
Email: etsher@fasonet.bf

ORSTOM (Institut français de recherche scientifique pour le développement en coopération)
Scientific Information Centre - Ouagadougou

Note (copied form web site, URL still to be added?

01 BP 182, Ouagadougou, Burkina Faso
Tel: +226 30 67 37
Fax: +226 31 03 85
Email: tankoano@ouaga.orstom.bf
See also: Obervatoire Hydrologique Régional de l'Afrique de l'Ouest et Centrale (OHRAOC)

PAID/WAS (PanAfrican Institute for Development - West Africa/Sahel)
01 BP 1756 Ouagadougou 01, Burkina Faso
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Côte d'Ivoire

African Development Bank Group
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UNDP-World Bank Water and Sanitation Program

Regional Water and Sanitation Group for
West and Central Africa, World Bank,
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PADIS (Pan African Development
Information System)
Pan African Development Information
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Fax: +251 1 51 44 16
Email:
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501301/2/3
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AWN (Africa Water Network)
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UNCHS (Habitat)
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623799
Fax: +254 2 623080 /
624266
Email:
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International)
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022 / 172
Fax: +254 2 562175
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elci@elci.gn.apc.org
or:
elci@ecli.sasa.unep.no

IRCSA (International Rainwater Catchment
Systems Association)
PO Box 38638, Nairobi, Kenya
Tel: +254 2 556943 /
555579 / 506363

Fax: +254 2 556943 /
555513
Email:
awn@elci.gn.apc.org
See also: GARNET Topic Network:
Rainwater Harvesting

KWAHO (Kenya Water for Health
Organization)
PO Box 61470, Nairobi, Kenya
Tel: +254 2 557550
Fax: +254 2 543265

Mazingira Institute
Box 4550, Nairobi, Kenya
Tel: +254 2 443219 /
443226 / 443229
Fax: +254 2 442595
Email:
mazingiri@elci.sasa.unep.no

NETWAS International
Magadi Road, Off Langata Road, Nairobi,
Kenya
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8
Fax: +254 2 890554
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netwas@nbnet.co.ke

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260400
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Mozambique

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/ 303100

Namibia

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Foundation House, 7 Rossini Street,
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Rwanda

AMREF (African Medical and Research
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