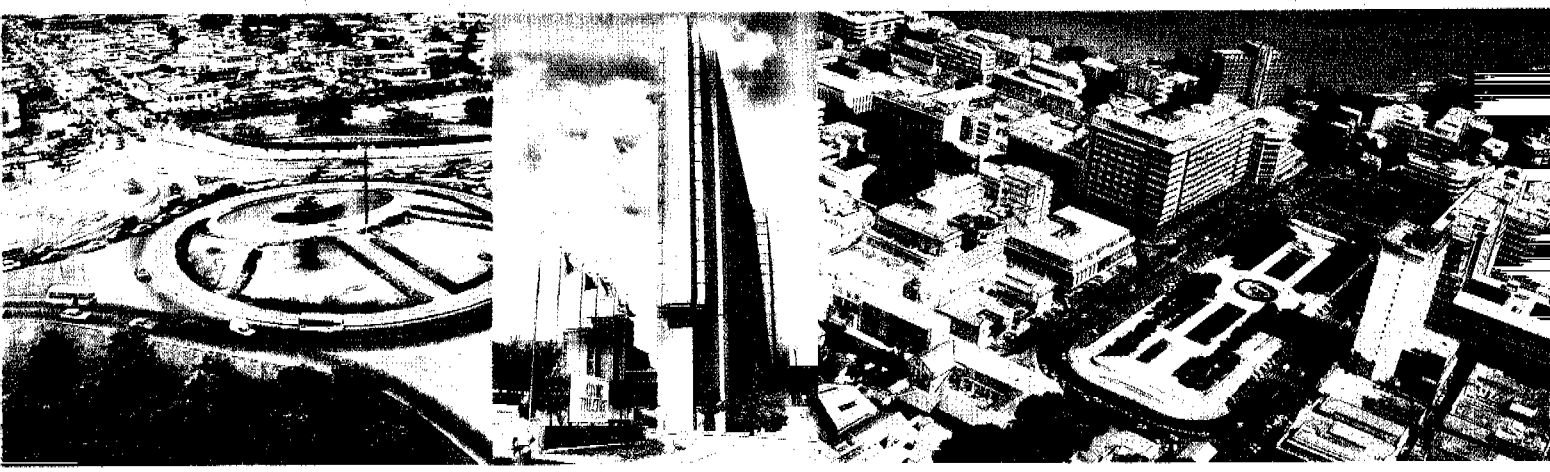


Water for African Cities

Building Capacity to Improve Water Management in African Cities

UNCHS (Habitat) 2001

A regional programme funded by

the United Nations Foundation,

other multilateral and bilateral donors,

and implemented by

UNCHS (Habitat) in collaboration with UNEP

Message from the Executive Director

Africa is urbanizing at an unprecedented pace as it enters the new millennium. Urbanization is a reality that we must face and turn to our advantage as cities drive the engines of economic and social development.

However, urbanization has also put enormous pressure on the continent's natural resources, water in particular. Depletion, wastage and pollution of water resources are threatening the sustainability of economic and social development. The provision of adequate supplies of water to agriculture, industry and the growing number of urban residents, especially the urban poor, is one of the biggest challenges facing governments and local authorities today.

Water scarcity is also rapidly becoming a source of social conflict. More than half of the populations living in African cities today are denied access to municipal supplies and the poor are forced to pay to street vendors for a litre of water as much as five to twenty times of what their affluent neighbours pay for municipal supplies.

Paradoxically, while the urban poor struggle for water, more than half of the water produced at a high cost to serve the needs of our burgeoning cities is lost even before it reaches the consumers. There is also little control of wasteful and profligate use. Industry is a growing user of water but seldom practices water recycling or water reuse.

The urban water crisis, in the final analysis, is a crisis of governance rather than a crisis of scarcity. I am pleased to note that The Water for African Cities Programme is supporting African countries in the vital area of urban governance. I remain confident that the policy guidance and oversight provided to the programme by the responsible Ministers of the participating countries through the High-level Ministerial Advisory Group will ensure that the programme is implemented in a truly demand-driven manner.

I take this opportunity to congratulate the United Nations Foundation and our other implementing partners for their laudable support to African countries through this important regional initiative.

Anna Kajumulo Tibaijuka

Executive Director

United Nations Centre for Human Settlements

Foreword

The Water for African Cities Programme has established its presence in Africa in a relatively short span of time. A number of features characterize the distinctiveness of the programme and its complementarity with other ongoing initiatives.

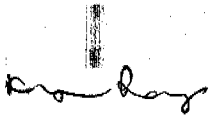
Firstly, by promoting a coordinated approach, it has brought together three key development sectors: urban development, water and the environment, to deal with the growing water crisis in African cities. The usefulness of this coordination mechanism is clearly evident from the contribution of the programme steering committee to the ongoing sector reforms in the participating countries.

Secondly, the new demand-side focus of the programme, with emphasis on information, advocacy and education, complements well the ongoing supply expansion efforts of governments and external support agencies.

Thirdly, by translating the Cape Town Ministerial Declaration (December 1997) into a ground-level action initiative, it has generated wide political support and has established a network of African policymakers, city managers and professionals addressing urban water issues. The programme remains firmly demand-driven, thanks to the policy guidance and oversight provided by the Ministerial Advisory Group comprising responsible Ministers from the participating countries.

Fourthly, the project is solidly backed by concrete commitments from African Governments to bring in country- and city-level resources into this initiative, matching support from the international community. The programme interfaces closely with ongoing activities of service provider agencies to ensure longer-term sustainability of its capacity-building efforts.

Finally, the programme has developed a flexible framework for multi-agency collaboration in the urban water sector, providing new and innovative partnership arrangements with bilateral and multilateral agencies active in the water sector in Africa.



Kalyan Ray
Coordinator,
Water for African Cities Programme



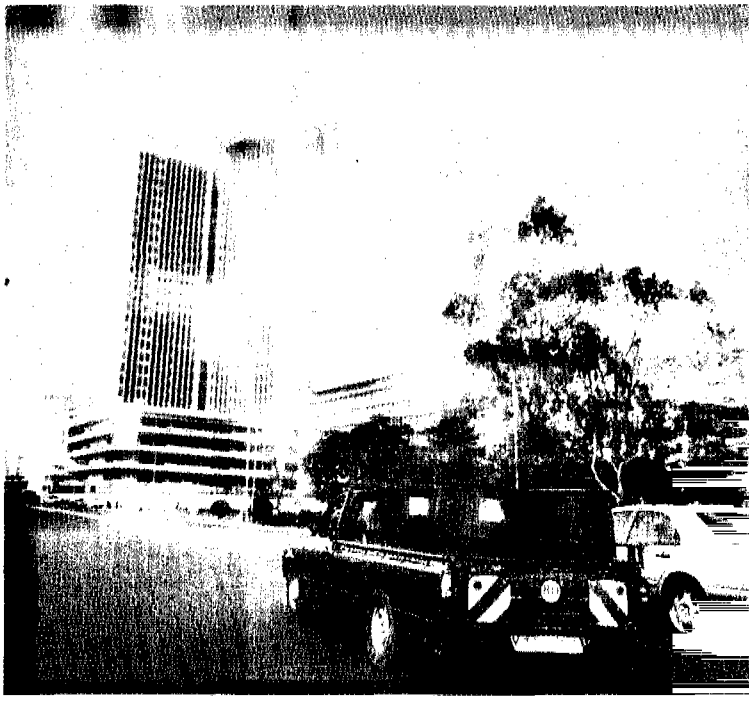

CONTENTS

1

Why Focus on Water for African Cities?

Africa entered the twenty-first century with an unprecedented urban transition. The region, which until recently was predominantly rural, is experiencing the world's most rapid rate of urbanisation at nearly 5 per cent per annum. Its urban population will nearly quadruple from 138 million in 1990 to 500 million in 2020 with increasing concentration in medium and large cities. By 2020, African cities which have a population of more that one million will accommodate almost 200 million people, which is 20 per cent of the region's total population and 40 per cent of its urban population.

Cities in Africa are already playing a key role in the development efforts of countries in the region, by contributing to growth, exports



and employment. These include not only the megacities, which act as centres of political power and commerce (like Cairo, Lagos, Abidjan and Johannesburg), but also smaller cities, which account for a substantial part of the gross domestic product of several African countries. With increasing industrialisation and the growth of the tertiary sector, several cities will continue to act as nerve centres and engines of growth on the continent.

With these patterns of unprecedented urbanisation, the demands for water supply for industrial, commercial and domestic use continue to rise and outpace the capacities of governments to cope, resulting in gaps, which have steadily widened over the years. This situation threatens sustainable development and the environment of cities. In addition, drinking water supply coverage in African cities is the poorest among all regions, with more than a quarter of urban populations remaining without adequate access to safe water.

The increasing concentration of populations in urban areas and the growth of large cities on the continent also put enormous pressure on the fresh water resources of African countries. Per capita water availability continues to decline in Africa. A survey of 29 Sub-Saharan African countries in 1990 showed that 8 were suffering from water stress or water scarcity. By 2025 this number will increase to 20 out of the 29. Many cities require freshwater to be conveyed over great distances or abstracted from deep aquifers. Cities are also discharging ever-increasing volumes of waste into freshwater bodies, threatening water quality and aquatic ecosystems:

Some of the key factors, which aggravate the situation and could, pose a serious threat not only to the sustainability of cities but also to the supporting ecosystems include:

Increasing water demand from cities

As African cities continue to grow, the hinterlands from which they draw upon water

resources also expand. Many African cities have already outgrown the capacity of local sources to provide adequate, sustainable water.

Dakar (Senegal), for example, with a population of 250,000 in 1961, relied on its basalt aquifer for drinking water supplies. By 1988, its population had reached 1.5 million and the local ground water supplies were already over pumped, resulting in saline intrusion. A large part of the city's water now has to be brought in from the Lac de Guiers, 200 kilometres away.

The agricultural hinterlands supporting the cities are also expanding with growing urban populations, often resulting in deforestation and accelerated soil erosion. The sedimentation loads caused by deforestation in Malawi, Tanzania and Mozambique, for example, are inhibiting fish reproduction in Lake Malawi. Meanwhile, urban populations in these countries have grown three to ten fold.

Urban growth in water stress regions

Several African countries experiencing rapid urban growth, or already with large urban agglomerations, currently suffer from chronic water stress or water scarcity and more important, the per capita water availability is sharply declining in the large majority of these countries.

Examples: Urban centres relying fully or in part on the Nile (Cairo, Alexandria), Tana (Nairobi) Limpopo, (Johannesburg, Pietersburg, Bulawayo and Gaborone) and Orange River (Upington) basin already experience water scarcity, and those in Lake Chad (N'Djamena, Maiduguri), and Niger (Bamako, Niamey and Abuja) basins currently experience water stress. By 2020, water scarcity will extend to all these basins, with per capita water availability reduced to less than 1000 cubic metres per year.

Cities sharing international river basins

Several large African cities share at least one international river basin, notably, the Nile,

Niger, Congo, Limpopo, Volta and Zambezi. The growing water demand and the discharge of wastewater from these cities pose a special challenge of managing the water resources of these river basins in a co-ordinated manner. The high seasonal variation in river flows and the concentration of rainfall in upstream countries further heighten the interdependence of riparian states (and water-sharing cities).

Threat to water quality and ecosystems

Sharing of common water bodies by several African cities poses a special threat to freshwater quality and delicate aquatic ecosystems. Some of these ecosystems such as Lake Victoria's are already facing severe degradation by the land-based pollution generated by urban settlements like Kisumu (Kenya), Jinja (Uganda) and Mwanza (Tanzania). The scale and intensity of this degradation is likely to increase significantly in the coming years, with expanding economic activities, industrialisation and urbanisation.

The Cape Town Declaration

The Cape Town Declaration, adopted by African Ministers in Cape Town, South Africa, in December 1997, expressed serious concern at the inability of African cities to provide safe drinking water to their populations. The consequences being the increased burden of health care, and reduced productivity and quality of life. The Declaration also drew attention to the serious threat of depletion, pollution and degradation of Africa's freshwater resources posed by the expanding urban areas on the continent.

The Declaration underscored the strong political resolve to deal with this threat and recommended that governments at appropriate levels work with their partners to develop and implement programmes of action to meet the growing urban water challenge.

II

Managing Water for African Cities: an innovative regional initiative

The regional programme: Managing Water for African Cities is a collaborative initiative of UNCHS (Habitat) and UNEP, within the framework of the United Nations System-wide Initiative on Africa and is a direct follow-up of the Cape Town Declaration. It is the first comprehensive initiative to support African countries to effectively manage their growing water needs and protect the continent's threatened water resources and aquatic ecosystems from the increasing volume of land-based pollution from the cities.

The programme is specifically focusing on three interlinked priorities:

- Introducing effective urban water management strategies in African cities. Demand management and other related measures are being implemented in the seven participating cities through city-wide action plans;

  Protecting freshwater resources and aquatic ecosystems from the growing volumes of urban wastes. The programme is assisting African countries to put in place early warning mechanisms for timely detection of potential "hot spots" where sustainability is likely to be threatened. The programme is also facilitating the assessment of long-term environmental impact of the growing ecological footprints of large cities on the continent's water resources.

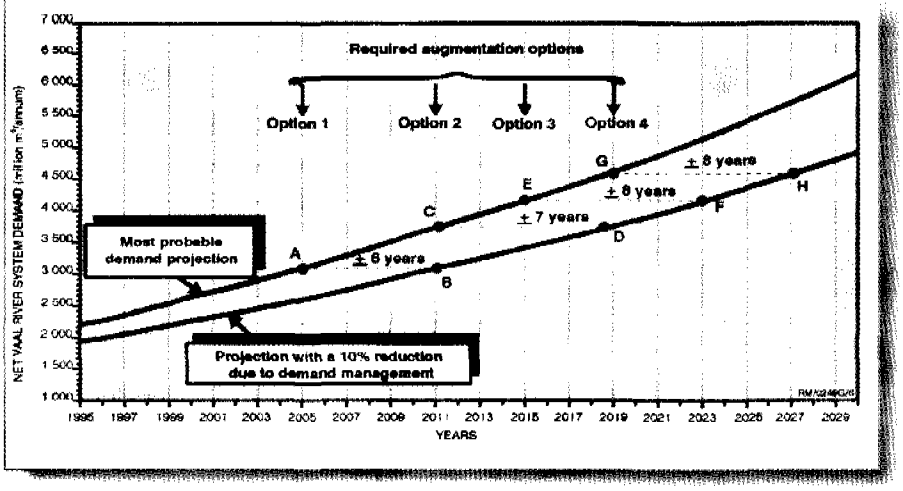
  Enhancing regional capacity for urban water management through information sharing, training, public awareness raising and water education.

KEY ISSUES ADDRESSED

Water Demand Management

The programme has developed a new demand-side focus to urban water management, with emphasis on reduction of unaccounted for water. The programme, specifically, focuses on improving the efficiency of distribution and operation, accounting for all water, and efficient use and control of demand for water in the cities.

Managing Water Demand Defers Future Augmentation Schemes



WDM Practices in Dakar and Johannesburg

Dakar

As part of ongoing World Bank projects in the city the programme is working on the development of a citywide water demand management strategy, covering regulatory, technical and management aspects. The technical measures focus on a demonstration of retrofitting, viz:

- Repairing defective taps
- Replacing automatic urinals
- Low-flow shower heads 6 l/min
- Push taps in communal toilets 0.5 l/push
- Syphonic toilets 5l/flush
- Aerated faucets

It is estimated that the savings in the pilot demonstration will total 17,040 m3/day with cost savings of 131 521 800 CFA/annum for the 4 pilot sites. The retrofitting demonstration is supported by a citywide local awareness campaign.

Johannesburg

A demand management strategy (WC&DM) has been developed and is being implemented by the new Water Utility, Johannesburg Water. The strategy focuses on:

- Managing unaccounted for water by establishing management zones, by pressure management, monitoring night flows, leakage control and replacing old pipelines.
- Efficient use of water and control of demand, through retrofitting, developing tariff structures and public involvement.
- Accounting for all water through water audits, monitoring of meters and performance targets.

Retrofitting practices have been implemented in Johannesburg by Rand Water and have succeeded in reducing UAW by up to 35%, thus illustrating the impact that such a WDM strategy can have on a city's water supply.

The priority issues addressed by the programme include:

- Efficient Distribution & Operation
  - Establishment of management zones
  - Monitoring of unaccounted for water in each zone
  - Pressure management
  - Active and passive leakage control
- Accounting for all Water
  - Water Audits
  - Bulk and management meters
  - Consumer meters
- Efficient Use and Control of Demand
  - Selective retrofitting of public and commercial buildings
  - Tariff structures and billing procedures
  - Payment for water

Controlling Water Pollution

The programme is promoting protection of freshwater quality from urban pollution focusing on:

- Integrated rapid assessment, based on compiled and analysed data on point and non-point sources of pollution with emphasis on catchment or acquifer systems.
- Developing strategies for the mitigation of impact of urban pollutants on fresh water qualities.
- Developing city-wide action plans based on stakeholder consultations
- Public awareness campaigns to sensitise domestic, industrial and commercial sectors on water quality issues
- Capacity building of institutions and strengthening frameworks for co-operation amongst stakeholders.
- Demonstration projects that promote participatory water quality control with active involvement of communities.

Controlling Water Pollution in Accra and Lusaka

Accra

Accra city receives some of its water supply from the Densu River. High levels of pollution have resulted in the resource being very expensive to treat, almost to the point that it is uneconomic. The Densu river basin is being degraded by agricultural and human settlement activities. This is impacting adversely on the natural resources (land and water) on which the livelihood and health of the people depend and poses a threat to the aquatic ecosystems.

To reverse the degradation of the basin the programme has completed a basin-wide study and follow-up actions include:

- Establishment of a Densu River Basin Board.
- Public awareness campaign and mobilisation of political will.
- Regulation of the use of natural resources (land, forest, wildlife, water, etc.)
- Monitoring and assessment of the state of natural resources.
- Creation of buffer zones (about 100m) along the banks of the river.
- Planting of trees and ban on farming in the buffer zone.
- Implementation of site restoration programme.
- Ban of the use of chemicals and explosives for fishing.
- Preparation of land suitability and land capability maps to guide land allocation.
- Desilting of drains and river channels

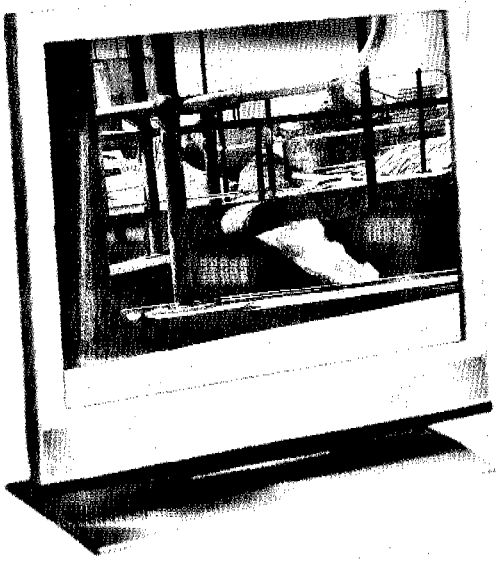
The implementation of a local catchment management plan will result in reduced treatment costs of water and improve livelihoods for the towns and cities on the River.

Lusaka

The programme is developing a strategy for enhanced aquifer management, which focuses on the mitigation of aquifer contamination and over-exploitation. Available statistics indicate that only about 55% of the low-income population have access to safe water supply, with the rest relying mostly on groundwater from shallow wells

The programme is introducing a community-based aquifer management approach as follows:

- Community-based environmental assessment, including the assessment of level of pollution of water supplies by source, and level of contamination of aquifer and main causes of environmental pollution
- Community-based decision making on solutions
- Encourage improved management of community-based water supply system
- Increase community awareness about local aquifer as a source of water supply and its contamination
- Use of community-based action planning and implementation
- Use of community-based monitoring and evaluation of impact



Public Awareness, Information & Education

The awareness- information- education component of the programme is a multi-pronged, multi-media and participatory process that is helping to boost awareness, promote information exchange and engender a water-friendly ethic amongst consumers, sector professionals and policy makers.

Working with the mass media, CBOs, NGOs, educational and research institutions, the private sector and other partners, the programme is developing a range of information, education and communication products to promote awareness about water. The programme's listserve (WACNET), website (WACWEB), hard-copy newsletter, media relations, consumer awareness campaign and consumer/schools water education, and city-level awareness campaigns are major interventions based on this component.

The Addis Ababa City Public Awareness Campaign

The Addis Ababa Water and Sewerage Authority (AAWSA) which supplies and manages water in Addis Ababa, initiated an extensive Customer Relations Improvement Plan (CRIP) in 1999. It involved customer care training for staff members, and developed into a practical Public Awareness Strategy and Implementation Programme (PASIP) whose key objectives were:

- To enhance AAWSA's image in the eyes of all stakeholders in the water sector.
- To position water as an important commercial and social issue in the context of the long-term development objectives of the city of Addis Ababa.
- To provide a sustainable foundation for the implementation of water demand management and pollution control programmes.
- To involve AAWSA staff and its external stakeholders in a range of community based activities and initiatives aimed at promoting good practices in water usage.

A cross-departmental steering committee was set up to work with employees, the private sector and other stakeholders to implement a participatory awareness campaign involving middle and senior management, and building the capacity of the public relations department, to ensure institutionalisation and sustainability of the initiative.

The campaign has included the following activities: introduction of the Addis Ababa Water Week; a schools awareness programme; publication of a water bulletin; a "high user's forum", a "catchment forum", a "media forum" and "branch customer forums".

III

How is the Programme Implemented?

The programme is being implemented in a phased manner as follows:

- The start-up phase for in-country consultations and discussions with other partners to firm up implementation arrangements, has been concluded;
- The implementation phase for the execution of demonstration activities in the selected cities and for the region-wide implementation of information, awareness-building and training activities, is ongoing; and
- The consolidation phase for region-wide dissemination of programme results and experiences will take place at the end of the programme.

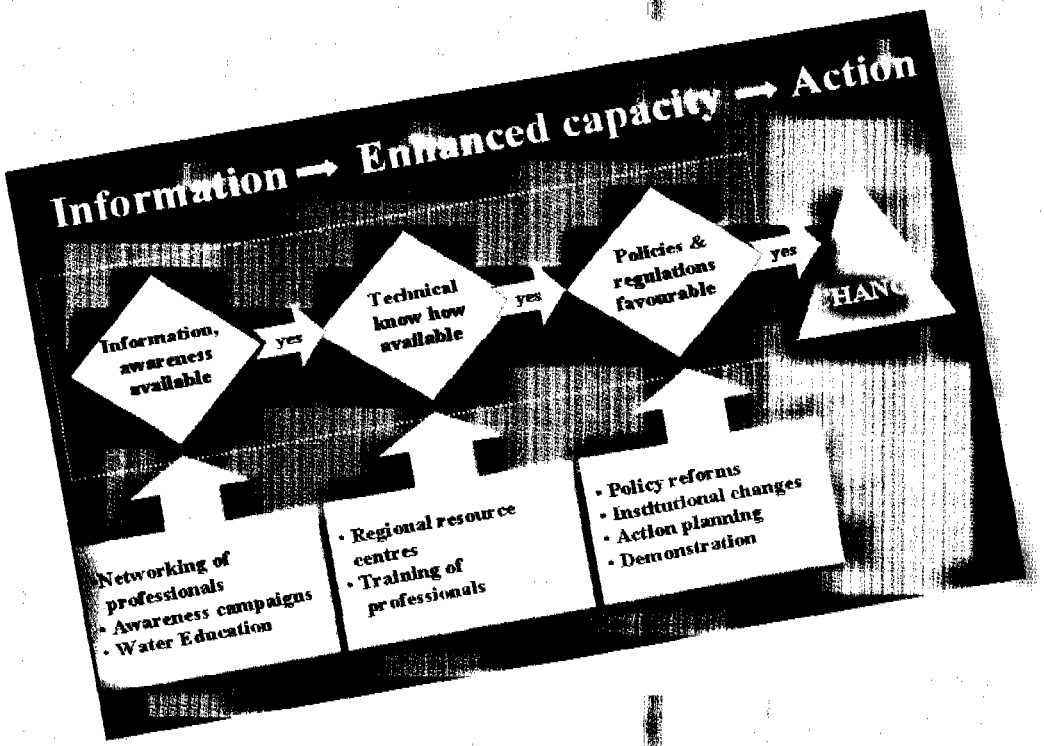
Start-up Phase

The start-up phase included the following programme development activities:

- Seven cities were selected for demonstration projects, namely: Abidjan, (Cote d'Ivoire), Accra (Ghana), Addis Ababa (Ethiopia), Dakar (Senegal), Johannesburg (South Africa), Lusaka (Zambia) and Nairobi (Kenya). They were selected based on the following criteria:
  - Location within a water-stress region;
  - Availability of adequate local institutional and human resources capacity;
  - Demonstration of commitment by relevant city and national authorities; and
  - Geographical distribution and coverage.
- The programme implementation strategy was finalised by an international expert group
- Implementation plan for the regional Information and Awareness-raising Campaign was also finalised during this phase

Implementation Phase

The programme is being implemented along two parallel but complementary tracks:



- Demonstration of good practices of urban water resources management in seven selected cities; and
- Enhancing regional capacity for urban water management through information exchange, human resource development, and awareness raising and water education.

Consolidation Phase

The results of all studies and documentation and demonstration projects carried out by the programme in the selected cities will be discussed and disseminated at a regional conference to be organised in the final stage of the pilot phase of the programme in 2002. The conference will provide an opportunity for policy makers, planners and managers from all African countries to exchange their experiences and identify action priorities for their respective countries in the area of urban water resources management.

Policy Guidance from Ministerial Advisory Group

A High-level (Ministerial) Advisory Group, comprising Ministers from the seven participating African countries, provides general oversight over the programme, and guides implementation activities. The Advisory Group meets periodically to review progress and interact with city managers from the participating cities and the programme management staff.

IV

What Does the Programme Seek to Achieve?

- Establish an extensive information exchange network for African water professionals.
- Promote demand management practices as an accepted norm in water sector policies in African countries.
- Refocus government priority on operation and maintenance of water services to reduce excessive unaccounted for water.
- Promote catchment management as an integral part of urban water resources management.
- Promote water education aimed at introducing a new and sustained water conservation ethic in African cities.
- Train city managers and build capacity for urban water management in African cities.
- Develop regional resource centres to anchor enhanced capacity within the region.
- Mainstream gender issues in urban water management and promote better access for the urban poor.
- Raise awareness about water conservation including introduction of an African Water Prize for outstanding contribution on urban water management.

The idea of a regional clearinghouse of information on urban water resources management will be developed by the programme and will be presented at the regional conference for endorsement.

V

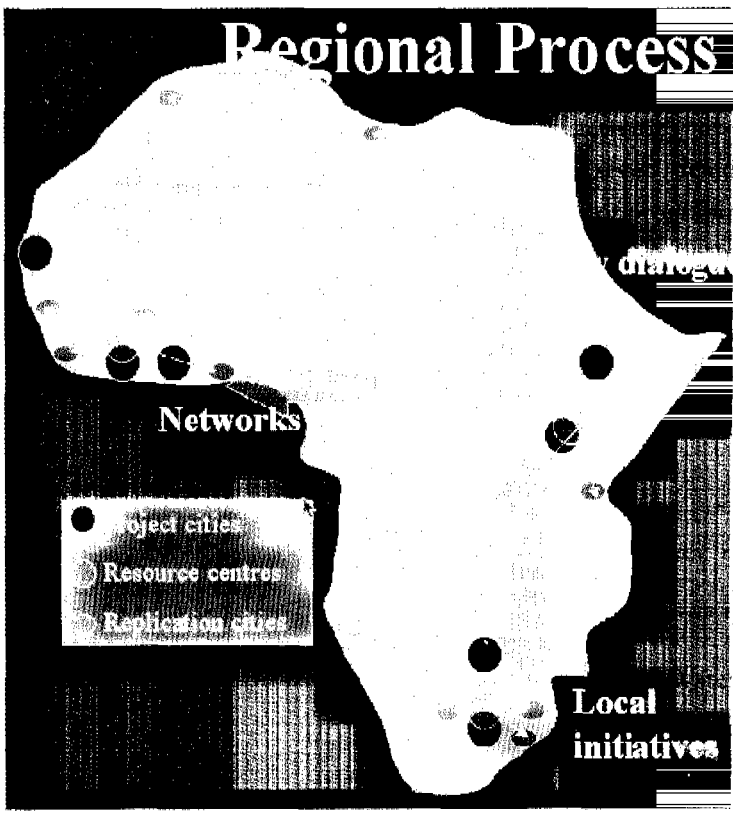
Regional Activities

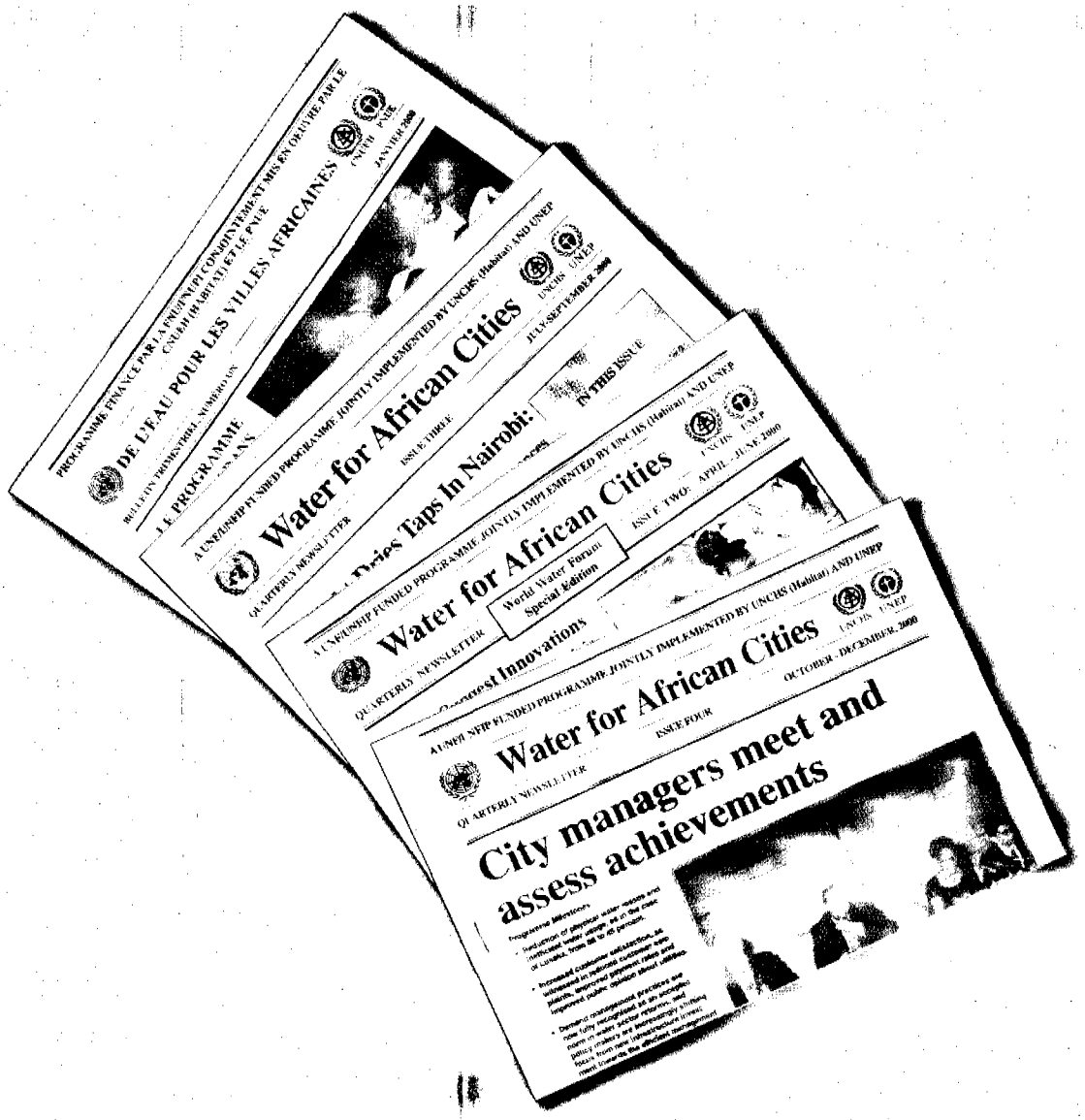
Regional activities of the programme are primarily aimed at extending its outreach and benefits to other countries in the continent which are not directly participating in demonstration projects but could gain from sharing of information and experience of good practices and through policy dialogue and research. Regional activities include: information exchange, study visits, capacity building in regional resource centres, training of utility managers and gender mainstreaming activities.

Regional activities also promote synergy among the seven demonstration cities and efficient use of programme resources through the development of generic tools and guidelines for city managers. Emphasis is given to anchor the capacity being developed in selected regional resource centres with a view to ensure sustainability of the initiative in the longer term.

Highlights of the key regional activities are given below:

WACWEB: The Water for African Cities Web site is an active Internet compilation of references and sources on urban water issues, which has been created to provide information and links on a number of subjects, notably: Water for Low Income Settlements, Water Demand Management, Pollution Mitigation, Awareness Raising, Gender, Tools, Training, Resources for Water Utilities, Suppliers, Upcoming Events, News and a WAC-Archive of essential past events. The site provides a mass of Africa-related and global references for partners/stakehold-



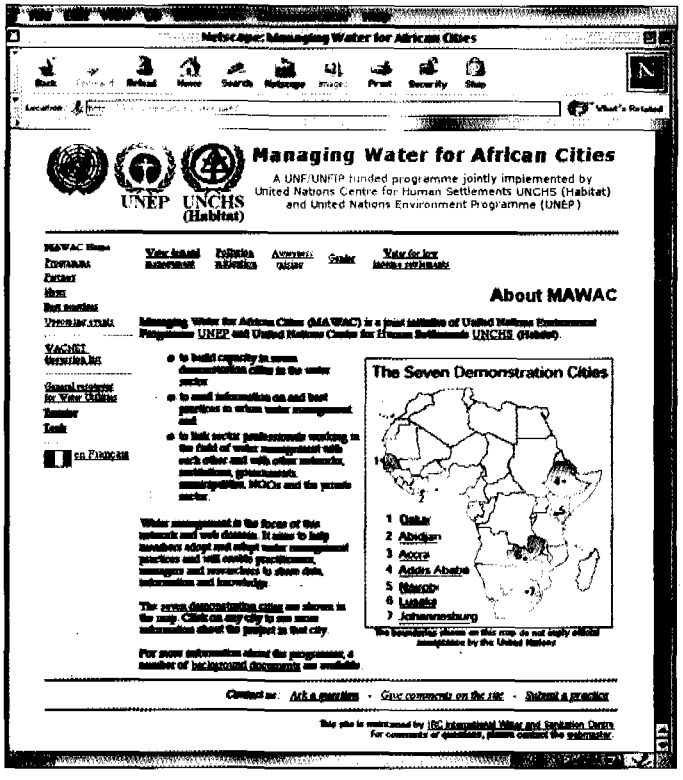


ers, beneficiaries and the general public on urban water issues concerning Africa. The site can be browsed on www.un-urbanwater.net.

WACNET: The Water for African Cities Network is an e-mail discussion service created with the strategic objective of linking water sector professionals dealing with urban water issues, particularly in Africa. The list serve connects the stakeholders in the Programme with other policy makers, researchers and practitioners, in order to facilitate open discussions (questions, queries, notices, etc.) or structured debates, typically in the form of an electronic conference. Discussions during the year 2000 have covered issues like water demand management, demand assessment techniques, opera-

WAC Newsletter

The quarterly newsletter concerning water issues in African cities was initiated to reach water sector stakeholders in Africa including those without access to electronic communication services, given the stage of development of computing and telephony on the continent. Contributors with different backgrounds, who are nevertheless involved with water, address a wide range of issues in each edition. The first edition was published in January 2000. The print-run is 3000 copies in English and 1000 in French, and the target readership is sector professionals, city managers, policy makers, donors, NGOs, programme partners and the press.



tion and maintenance issues, billing procedures and the use of dry sanitation. The WACNET can be visited on the DISCUSSION button of the WACWEB or on www.mailbase.ac.uk/list/wacnet

Water Education

The water education initiative is intended to create a new, water-use ethic in African society. Using a value-based approach, it will be impemented, to begin with, in seven demonstration countries currently participating in the Water for African Cities Programme. The five key areas of intervention would be:

- National curricula review for introducing water education in schools.
- Development of learning material.
- Training of trainers on water education.
- Establishing water education class rooms in pilot cities.
- Community water education.

Twinning of schools and cities is also planned as part of this initiative.

Study Visits

Sharing of experiences and learning from bad and good practices are a critical component of the programme. City managers engage in study visits within the region and outside from time to time. Since 1999, the city managers have undertaken such visits to the southern African cities of Durban, Johannesburg and Windhoek (1999), and to Tel Aviv in Israel (2000).

Regional Resource Centres

Two regional resource centres are being established in Africa, with a view to anchor the capacity being developed by the programme within the region. The objective is to strengthen two existing institutions within the region, which could help urban water utilities with information, networking, training and consultancy services in the field of urban water resources management.

Training and Capacity Building

The programme is helping to train professionals in urban water resources management. It is also assisting to institutionalise the training programme through capacity building in the form of training-of-trainers and by providing technical support to exist-

ing local training institutes and regional resource centres. Key highlights of these activities are given below.

- Training of professionals

The programme is developing separate training programmes in terms of content, training methodology and duration of implementation for three target groups of professionals:

- Policy and decision-makers (managing directors and administrative / political leaders); training is of the seminar/exposure/workshop type, and is addressing policy, strategy and programme development.

- Senior managers (heads of technical and financial departments) training is of the seminar/exposure/workshop type, and is addressing project planning, resource allocation, co-ordination and similar issues.

- Middle level managers (heads of distribution districts and plant managers) training is of the workshop/exposure type and is addressing project preparation and implementation in the areas of urban water management.

- Capacity Building in Regional Training Centres

An international capacity building institute (ICBI) is leading the capacity building effort which will be implemented in the selected regional centres as well as in local centres in each participating country. The ICBI has designed a capacity building programme for each of the selected centres that is tailored to the activities to be implemented by that Centre within the framework of the training programme and the observed capacity deficiencies.

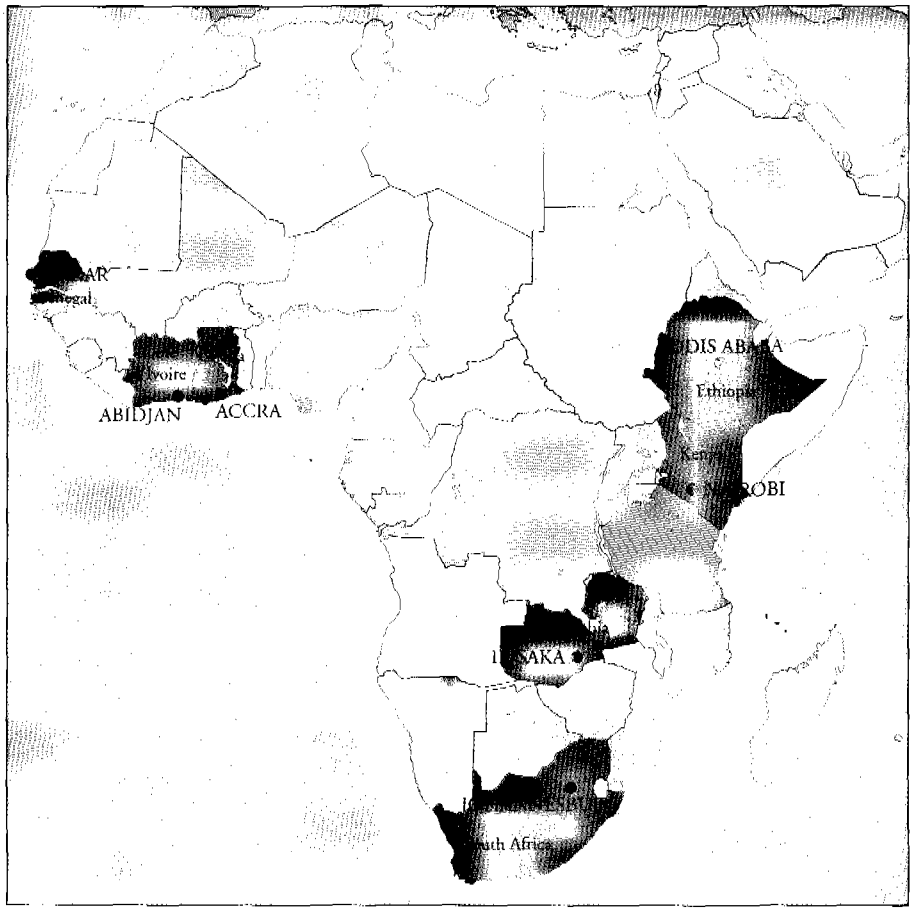
Gender Mainstreaming

The programme is assisting to empower women in water management and raise gender awareness for key stakeholders. It is also helping to strengthen the capacity of governments in gender mainstreaming and promoting networking and exchange of information on gender mainstreaming in the water sector in African cities.

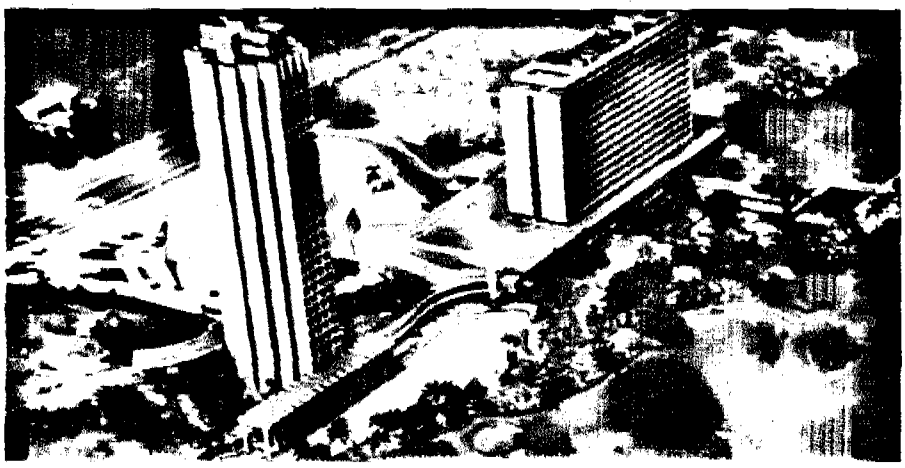
VI

Demonstration Cities

The programme is currently being implemented in the seven demonstration cities: Abidjan (Cote d'Ivoire), Accra (Ghana), Addis Ababa (Ethiopia), Dakar (Senegal), Johannesburg (South Africa), Lusaka (Zambia) and Nairobi, (Kenya). Two more cities, Dar es Salaam (Tanzania) and Lagos (Nigeria) are expected to join the programme in the near future.



ABIDJAN
Cote d'Ivoire



Abidjan, the most populous city and economic capital of Cote d'Ivoire, has an estimated population of 3.3 million, which could rise to 5 million in 2010. It has a land area of 580 square kilometres and is governed by mayors of ten administrative entities, one of whom is elected to be Mayor of Abidjan.

As the country's major economic and industrial city, the Government has invested substantially to develop the water supply and drainage infrastructure. Most of the industrial activities, which are mainly agro-based, are located in the Vridi suburb to the south and Yopogon to the north, with a high water consumption rate and a vast potential for water pollution.

The main features of water supply in Abidjan are:

- A private company supplies water to the city;
- Ground water is the sole source of water supply;
- Water pollution has become a major problem due to industrial pollution and discharge of untreated domestic water in the lagoons, which now show signs of eutrophication;
- Wastewater collected through a network of pipes is being discharged in the sea, with no treatment provided;
- Storm water is discharged into the lagoon through open channels.

Need to Effectively Manage Ground Water

- Current exploitation of ground water is unsustainable and there is an urgent need for an information/knowledge base on the hydro-geological situation

and the resulting effects of both abstraction practices and the fate of pollutants.

- Water resources are not currently limited in the city, but demand will gradually reach levels where groundwater resources may be insufficient. There is need to develop a demand management strategy now to ensure that all actors use water efficiently.

- A large proportion of Abidjan's urban poor is without efficient services. There is however an ability to pay and many of the poor already pay high prices to unsolicited water vendors and other suppliers.

- Public awareness about the need to conserve water is very limited in Abidjan.

Action

- Assessment and control of pollution of ground water resources, using tools, which are being developed.

- Water demand management demonstrations for industrial and domestic installations and better services for the poor in selected areas in the city. This involves partnerships with the community and the private sector.

- Public awareness campaign on reduction of water consumption and protection of water resources from pollution. This involves education of all urban actors on impact of poor waste disposal practices.

Partners

- The Ministry of Environment and Forest
- SIIC and CIAPOL
- Mayor of Abidjan
- Private sector represented by SODECI (in charge of water supply in the city)
- Industrialists
- World Bank/UNDP

City Contact

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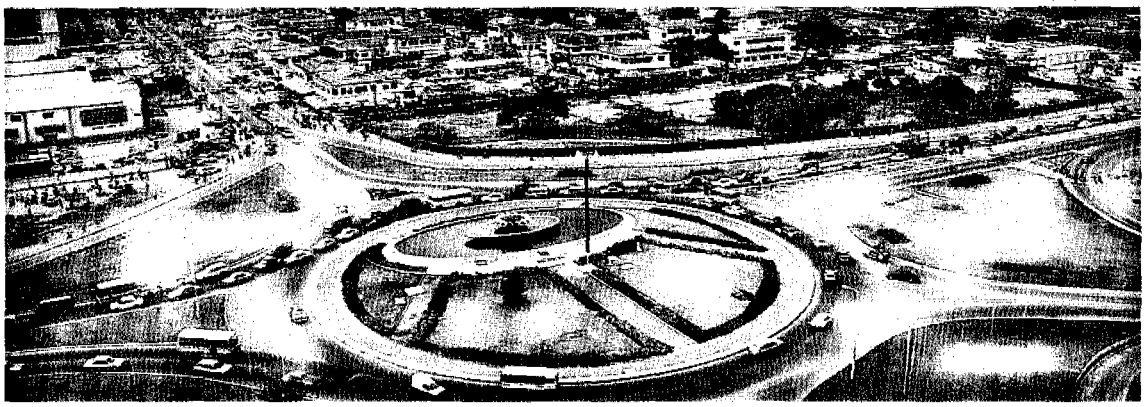
ACCRA
Ghana



The Accra Tema Metropolitan Area (ATMA), like the rest of Ghana, is supplied with water by the Ghana Water and Sewerage Corporation (GWSC), established in 1965 by an act of parliament. ATMA's regional office of GWSC undertakes the production, distribution, marketing and maintenance of water services in the area.

The estimated population of ATMA, which includes Accra, Tema and Ga districts was 2.2 million in 1995, and is expected to reach 3 million in 2005.

Two facilities, the Kpong and Weija water works, supply water to ATMA, with a combined total production capacity of 250,000 cubic meters per day.

Kpong waterworks, located 54 kilometres north of Tema, draw their water form the Volta River at a point between Akosombo and Kpong - Akuse dams, and the Weija water works located 15 kilometres west of Accra, draw their water from the Densu River, impounded by the Weija Dam.

While the Weija source is cheap to pump and is closer to its consumers, compared to the Kpong source, its cost of treatment is high, due to pollution from a heavy population in its basin and discharge of industrial waste.

In summary, the water supply situation in ATMA shows stagnation in production from 85 million cubic meters in 1979 to about 94 million cubic meters in 1995. Given a population increase ranging from 1.2 million in 1984 to 2.2 million in 1995, the consequent water shortages and rationing in the population are predictable.

Other problems include a drop in consumption and connection rates, inefficiency in supply and distribution, with unaccounted for water representing 55 per cent of potable water production. "Physical" losses, through the lines account for 30 per cent of losses, while "commercial" losses through ineffective metering and billing account for 25 per cent.

ATMA presents to the programme a challenge of the need to increase production and the need to remedy physical and commercial losses, while improving distribution, protecting the Wejia reservoir from pollution and enhancing sharing of information and experiences with other African cities. Loss of revenue from improper billing has caused a shortage of funds to implement WDM and public awareness programmes.

Basin-wide Pollution Control and Effective Water Demand Management

- Aspects of the water sector like billing, collection and meter installation are being privatised.
- A unit has been introduced within ATMA for leakage survey and task teams have been established to check the incidence of illegal connections, though these teams are hampered by logistic inadequacies.
- The major constraint to the implementation of the comprehensive WDM strategy in Accra (and other cities in the country) is the limitation in financial resources.
- Lack of adequate awareness campaigns to educate the populace on the implications of improper solid and liquid waste disposal within the city in the peri-urban settlements, as well as communities living along the stretch of the Densu River, is the main constraint to pollution control.

Action

- Assessment of current water use patterns and WDM potential and development of WDM strategy in consultation with stakeholders.
- WDM unit is being established within GSWC.
- Pilot project on WDM at Legon University Campus is being developed.

The activities under this project will be structured such that they dovetail into the ongoing studies being undertaken under the water sector-restructuring programme. The activities cover:

- Physical and commercial losses
- Inventory of replacement needs to overcome identified physical defects.
- Introduction of water conserving taps/faucets.
- Introduction of drip type systems for watering lawns and parks.
- Preparation of a plan of action to deal with commercial losses.
- Identification of other interventions needed for implementing the WDM action plan.
- A comprehensive proposal for implementing the plan, and identification of areas requiring external and other financial support.

Partners

- The Ministry of Works and Housing
- The Ghana Water and Sewerage Corporation
- The Water Resources Commission
- Public Utilities Regulatory Commission
- The Accra Metropolitan Assembly and The Tema Municipal Assembly
- Public Utilities Regulatory Commission
- The World Bank

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ADDIS ABABA
Ethiopia

The city of Addis Ababa, with 2.5 million inhabitants and a land area of about 500 square kilometers, gets its water mainly from surface water. Of this, about 175,000 cubic meters per day of treated water comes from the Geffersa and Lagadadi treatment plants, with Lagadadi, receiving water by pipe from Dire and Lagadadi Dams. Ground water wells and springs contribute about 10,000 cubic meters per day of potable water, while, new supply sources are under construction.

The Addis Ababa Water and Sewerage Authority (AAWSA) is an autonomous government establishment in charge of providing water and sewerage services to the city of Addis Ababa.

Water is conveyed from Lagadadi and Geffersa treatment plants through steel pipes to the city, while another DCI pipe transfers raw water from Dire Dam to Lagadadi Dam. Distribution in the city is done largely through sixteen transfer pumping stations using 33 reservoirs in different parts of the city. The supply lines are in three categories: primary, which convey water between service reservoirs and pumping stations, while the secondary and tertiary lines are for distribution.

The sewerage system which is not yet well developed has treatment plants at Kaliti to the west and Kotebe to the east. There are also primary (asbestos cement & DCI) pipes that convey wastewater from the collectors to the treatment plant, and secondary PVC lines that collect domestic waste to the main collectors.

Water Loss and City Pollutants

- The water for the city which is being extracted from three surface water reservoirs, springs and wells, has a

current shortfall of about 30 percent. The main water resource is surface water. Through a bid to close the demand gap to meet future needs the city is increasing supplies from ground water resources.

- According to a leak detection study project, the amount of unaccounted for-water in the network amounts to approximately 40 percent. This leads to a loss of approximately US $10 million per year in 1996. Consequently, AAWSA has embarked on a leak detection programme.

- In Addis Ababa and the surroundings, the common source of pollutants are domestic and industrial wastes. Almost all industrial effluents are discharged to natural stream channels without treatment. This results in pollution of the surface water and shallow ground water with heavy metals, toxic waste and other compounds. The domestic wastes were disposed to the stream channels which also result in significant pollution.

Conservation and pollution control measures

Water Demand Management: A conservation and demand management strategy is developed mainly through institutional capacity building of AAWSA.

Pollution Control is being improved through environmental monitoring and introducing of an early warning system as well as promotion of communications involvement.

Public Awareness Campaign

- AAWSA has been implementing a comprehensive awareness campaign, targeting consumers, and incorporating all categories of its staff members. The content of the campaigns is water demand management and related environmental issues, and other targeted beneficiaries are policy makers, technicians and engineers, communities and schools.

Partners

- Ministry of Economic Development and Cupertino
- Addis Ababa Water and Sewerage Authority
- Addis Ababa City Administration
- European Commission
- International Atomic Energy Agency
- World Bank
- Agence Francais de Development

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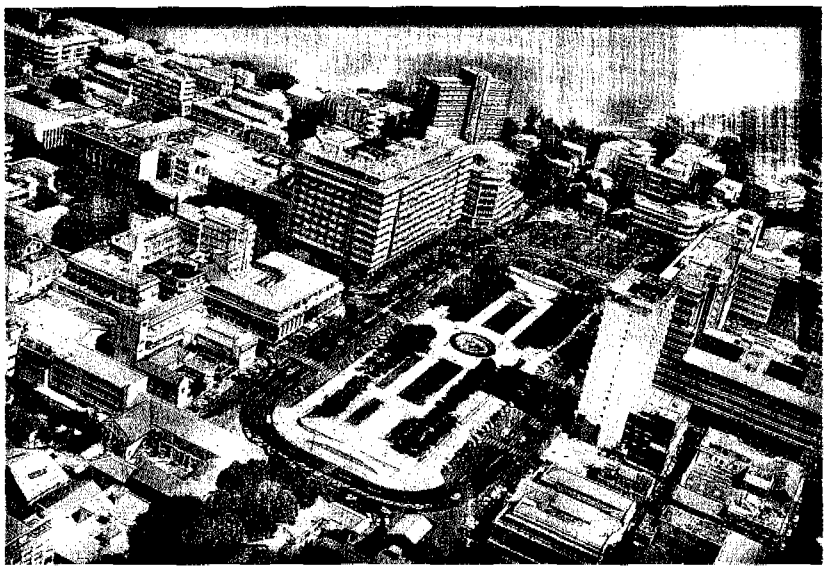
DAKAR
Senegal



Dakar, the capital of Senegal, currently supplies about 200,000 m3/day of potable water to its population of around 2 million. Approximately 80 per cent of this water come from ground water resources and the remainder from surface resources.

To meet the current demand-supply gap (estimated at 100,000 m3/day) and to meet the future needs, the Senegalese Government is currently implementing the Water Sector Project with IDA credit from the World Bank. The project is expected to increase the daily production to 600,000 m3/day by drawing from a distance surface source (Lac de Guiers). It is also attempting to reduce leakage losses from the current 30 per cent to 15 per cent by 2002.

The new United Nations project is being implemented within the framework of ongoing World Bank/IDA-funded Senegal water sector projects, especially the Dakar Water Sector projects. The focus will be on water demand management, reuse of wastewater and a public awareness campaign in the city of Dakar.

Focus on Lac de Guiers

The project will continue with supply expansion, ensuring that much of the Dakar water will be supplied from Lac de Guiers by 2002.

Senegal's water reform programme started in 1993 with an aim to create an environment conducive to the sector's growth. The reform was necessary to ensure continuity of management and rational organisation. The sector has been facing the following problems:

- The urgent need to increase medium term storage, production and distribution of water in Dakar, which required large-scale investment.
- The need to access large sources of private capital to satisfy long-term demand for Dakar and in the interim

period to reduce demand through appropriate measures.

- Difficulties have been experienced with paying water bills in two universities and Government services, which have inadequate budgetary allocations to cover their water consumption. Municipalities are not treated like regular customers and a cut-off policy has been implemented by Senegalaise des Eau that is already curbing wastage and rationalising consumption.

Water Demand Management Pilot-scale Evaluation

A pilot project is being implemented in Dakar public buildings and the university. Retrofitting of faucets, showerheads and toilet flushing is being tested using modern high-quality fittings, which can be imported and later manufactured locally. These fittings will be installed in public/office/university buildings where there is no financial incentive to conserve water. Also to be included would be apartment blocks where one bulk meter is installed for all residents and individual apartments pay for water at a flat rate.

The project will also assist the national sanitationagency (ONAS) to evaluate a decentralised, communuty-based wastewater collection and treatment facility in Rufisque. The net result will be on technologywhich can be replicated nationally and a code of practice for it's use.

Public Awareness Campaign

An awareness campaign is being implemented in the pilot area, prior to the retrofitting, and throughout the project duration.

Partners

- Ministry of Water, Department of Water Works and Sanitation
- National Water Company of Senegal (SONES)
- National Office of Urban Sanitation (ONAS)
- Senegalese des Eau (SDE)
- World Bank

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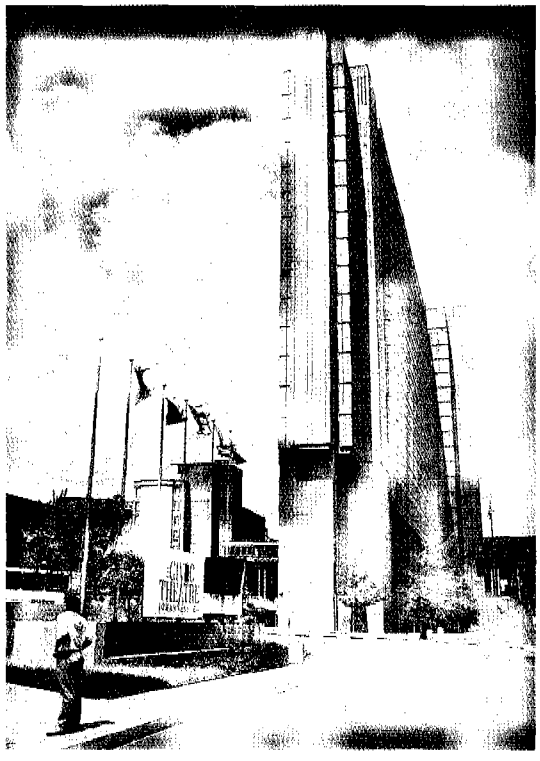
JOHANNESBURG
South Africa

The City of Johannesburg Metropolitan Municipality forms the largest urban complex in South Africa and one of the largest on the African continent comprising a total of 3.5 million people of which 400,000 are in informal settlements. Johannesburg is a unique metropolis in that it is the only one which is not located on a navigable river, estuary or has a seaport. It obtains most of its water from an adjoining region in Gauteng, via the Vaal River.

The city of Johannesburg is undergoing a transition whereby numerous institutional arrangements are having a direct impact on the management of water. These include new political boundaries, a significant loss in expertise and the appointment of an independent foreign water utility to manage the water supply, waste water collection and treatment in Johannesburg.

However the provision of water services in South Africa is different to other countries, with various institutions playing different roles in the water supply chain. These include:

- The national Department of Water Affairs and Forestry (DWAF), who play a dual role of developing water resources like building dams and transfer schemes and a regulatory function of ensuring the implementation of legislation.
- Rand Water (RW) is responsible for the treatment and bulk water supply to most of the municipalities in Southern Gauteng.



- Johannesburg Water (JW) is the newly formed water utility responsible for the distribution to end users and collection of waste water.

Water Demand Management

As part of the WAC project, a water conservation and demand management strategy has been developed and is ready for implementation by Johannesburg Water. It consists of managing unaccounted for water establishing management zones, by pressure management, monitoring night flows, leakage control and the replacement of old pipelines.

The second aspect of the strategy is the efficient use of water and control of demand, this is through retrofitting, developing tariff structures and public involvement. The third

aspect is accounting for all water through water audits, monitoring of meters and performance targets.

Finally water resource management is important and is achieved through supporting national policies, rainwater harvesting, water wise gardening and recycling of waste water.

Retrofitting is taking place in underdeveloped areas, hospitals and schools resulting in improvements in water consumption of up to 35%.

Pollution control and environmental management

Pollution monitoring is an important aspect of catchment management. This is currently being undertaken for chemical and bacterial water quality. This project has enabled the City of Johannesburg to co-ordinate the water monitoring being conducted by different agencies and allows for the detection of environmental "hot spots". A rapid environmental assessment is being carried out on both catchments in Johannesburg, which will be followed by a detailed catchment management strategy and action plan to guide the city towards sustainable water management. Another significant part of the project is the inclusion of communities from informal settlements in Kliptown, on the Klip river, where the community is actively involved in hands-on environmental and water related activities, thus improving their own water situation.

Water awareness campaign

Public awareness campaigns are critical for the success of any water conservation project, as it is necessary to change people's outlooks and behaviour patterns. The Johannesburg demonstration project is working in partnership with the Department of Water Affairs and Forestry (DWAF) on the 20/20 vision project, aimed at involving schoolchildren in water monitoring and river health.

Partners

- Department of Water Affairs (DWAF)
- Greater Johannesburg Metropolitan Council
- Rand Water
- Gauteng Water Forum
- Gauteng Water Demand Management Steering Committee
- City of Johannesburg
- Johannesburg Water

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LUSAKA

Zambia

Zambia has one of the highest urbanisation rates in Africa with 50 per cent of its population living in cities. Most towns of the country only receive intermittent water supply. The reason for this is lack of institutional framework that would assure sustainable provision of water supply and sanitation, lack of investment in the sector, water wastage and inefficient use, partial cost recovery and dearth of adequately qualified personnel in the sector. As a result, Zambia is implementing a major water sector reform programme. Lusaka Water and Sewerage Company (LWSC), a private company wholly owned by Lusaka City Council, is the water and sanitation provider for Lusaka. It is estimated that 52 per cent of Lusaka's water is unaccounted for, which translates into a daily loss in revenue of about US $ 45,000.

Lusaka city, with a population of about 2 million, gets its water from Kafue River and an aquifer, which stretches from North West to South East of the city. Water pollution has become a major problem for Lusaka over the past few years. Pollution originates from industries, uncollected solid waste and inadequate disposal as well as inadequate sanitary facilities in large informal settlements, where 60 per cent of Lusaka's population resides.

The aquifer in Lusaka is very vulnerable to pollution. A number of high density areas (informal settlements or peri-urban areas) sit on the relatively high and porous aquifer making the ground water supply from these areas vulnerable to pollution. The sources of pollution are mainly solid waste dumps and the shallow pit latrines.

ACTION

Water Demand Management

As a first step to support an institutional framework aimed at providing water and sanitation in a sustainable manner, the project is developing a water demand strategy for the city of Lusaka, within the framework of a new water demand management unit in LWSC. Demonstration projects are being conducted to support elements of the WDM strategy and build capacity in the WDM unit. One intervention is to reduce leakage and wastage of water in army and police barracks by rehabilitating the distribution system and retrofitting houses with water saving devices.

Environmental Impact Assessment

This component addresses one of the main water resources challenges facing Lusaka. A major challenge is to develop a sound aquifer management strategy to avoid over-abstraction. Communities greatly contribute to aquifer pollution through waste discharge and over-abstraction so the project is conducting demonstrations of community-based groundwater management. The second focus is to develop an overall strategy for sustainable aquifer management in Greater Lusaka.

Partners

- The Ministry of Local Government and Housing
- Ministry of Energy and Water Development (Department of Water Affairs)
- Lusaka City Council
- Lusaka Water and Sewerage Company
- Environmental Council of Zambia
- Water Sector Reform Support Unit
- The University of Zambia – Civil Engineering Department
- Sustainable Lusaka Programme/ UNDP

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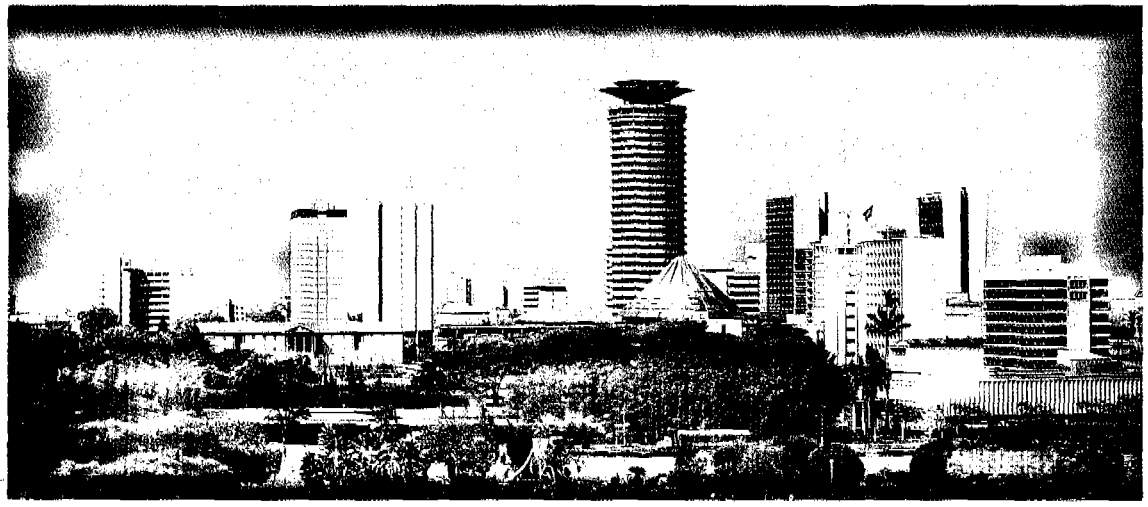
NAIROBI

Kenya



From the early years of Nairobi's inception, demand for water has grown tremendously. In the past twenty years or so, the water supply and distribution system in Nairobi has been expanded significantly to meet the demands of the growing population. The latest water sector projects in 1984 and 1995 resulted in an increase in the total available supply to Nairobi from 130,000m³/d to 190,000m³/d and from 400,000m³/d with a potential for 519,000m³/d respectively. Although bulk water supply to the city is not currently in short supply, the reticulation system is in a poor state of repair and currently around 50 per cent of the bulk water supplied to the city is lost through leakage, illegal connections, and other ways.

The Nairobi City Council embarked on studies to reduce the level of unaccounted for water and especially leakage, by instituting a Leakage Control Programme, beginning in 1989. Activities included (bulk metering, assessment of data from metering system, pilot investigations in leakage control methods and formulation of a leakage control policy), which subsequently led to the setting up of a Leakage Control Section within the Water Department. Despite repeated interventions by experts and external support, the programme has not achieved its objectives evident in the increase in leakage levels. There is an urgent need to improve the capacity of the unit and ensure that it exerts a significant impact on the reticulation system in Nairobi.

Nairobi's unplanned settlements continue to expand and currently represent 60 per cent of the city's population. These ever-expanding settlements have a marked impact on surface and groundwater resources. The "Nairobi Dam", for example, has become infested with aquatic macrophytes as a result of the high level of faecal pollution entering the water. The area has become an environ-

mental eyesore and vector-borne disease problems threaten the bordering peri-urban settlement.

Water Demand Management Strategy

The project is developing a strategy for water demand in the city based on the results of various pilot-scale demonstrations. A leakage study followed by retrofitting activities in selected areas of the city (including government offices, a brewery, a middle-income housing area) is part of project activities. A citywide public awareness campaign is also planned.

Pollution Control and Rehabilitation of Nairobi Dam

Pollution sources of water within the Nairobi boundary include fractured sewer pipes and urban run-off wastes, which pollute the Nairobi dam. A component of the project will study this water body and it's rehabilitation. A three- pronged approach is being implemented, namely:

- Control of the point sources of pollution to the water body
- Physical removal of the floating macrophytes by conversion to marketable items such as fuel briquettes and building materials
- Introducing appropriate biological control methods to prevent return of the weeds.

Improving Information and Awareness

An information and awareness component is being developed, which includes a schools education component.

Partners

- Ministry of Local Government
- Ministry of Water Resources
- Nairobi City Council

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