

---

# LIQUID LIFE

---

A publication for the 9th Waternet/WARFSA/GWP-SA symposium  
29-31 October 2008

---

## State of the art IWRM knowledge

The role of research in water resources development and management came under the spotlight at the 9th Water Symposium where water professionals, practitioners and policy-makers from Southern Africa and the wider International Community presented state-of-the-art knowledge in Integrated Water Resources Management (IWRM) at a three-day meeting in Johannesburg, South Africa from 29 to 31 October at Birchwood Hotel and Conference Centre.

About 230 water scientists and those with an interest in water met at the 9th WaterNet/WARFSA/GWP SA Symposium which is seen as the premier IWRM event on the Southern African Development Community (SADC) calendar and it is aimed at ensuring water research results are not just put on the shelves but are shared for the benefit of developing the water resources of the region and beyond.

The opening session of the meeting was graced by the presence of South Africa's Deputy Director General for the Department of Water and Forestry Thandeka Mbassa who opened the Symposium on behalf of the honourable Minister of Water Affairs and Forestry Lindiwe Hendricks.

Organized through the collaboration between WaterNet, the Water Research Fund for Southern Africa (WARFSA), the Global Water Partnership South-



*South Africa's Deputy Director General for the Department of Water and Forestry Thandeka Mbassa opened the symposium on behalf of the honourable Minister of Water Affairs and Forestry Lindiwe Hendricks.*

ern Africa (GWP SA) in association with the International Commission on Water Resources Systems (ICWRS) and the International Association of Hydrological Sciences (IAHS) in Johannesburg, South Africa, the Symposium was hosted by the University of Witwatersrand.

With the main theme as "Water and Sustainable Development for Improved Livelihoods" the Symposium, aimed at promoting interaction among policymakers, academics, water practitioners and key cooperating partners in identifying regional issues, gaps and priorities that require further research and support. About 100 papers covering a wide range of sub-themes were presented.

The importance of disseminating and sharing research results was the main focus as it is recognized that without having mechanisms for sharing such results, they remain on shelves gathering

dust despite the potential they have in enhancing the peoples' livelihoods through sustainable development of the water resources of the region.

The Symposium took a broader look at how sharing and dissemination of research results in IWRM within the context of sustainable development for the achievement of enhanced livelihoods could be facilitated.

"Raising awareness of IWRM within WaterNet has primarily been pursued through the annual WaterNet/WARFSA/GWP-SA Symposium. The symposium has grown since the year 2000 from a gathering of a small number of IWRM converts to the premier IWRM event on the SADC calendar," said Dr Themba Gumbo, WaterNet Manager.

Researchers and policymakers dialogued around how research can inform policy formulation in the water sector to ensure the

region remains on course in meeting the Millennium Development Goals (MDGs).

The sub-themes interrogated during the Symposium include hydrology, water and environment, water and land, water and society, water for people. Great emphasis was placed on integration of knowledge, particularly involving scholars from the natural, medical and social sciences.

"In addition to being the premier scientific gathering for IWRM in the SADC Region, the Symposium has expanded to include workshop sessions with water sector specialists during which scientific papers are dissected and analysed in order to tease out the implementation implications of the research that is conducted in the region.

Some of these have been developed into policy briefings by working closely with GWP-SA in raising awareness," Dr Gumbo said.

The 9th symposium succeeded eight other regional symposia which have been organised on a rotational basis among SADC member states.

The series of Symposia have helped to forge a regional family of water professionals concerned with the wise use of water.

During the last eight years, more than 1500 scientific papers have been presented, of which about half have been reviewed and published in Physics and Chemistry of the Earth, an Elsevier international peer reviewed science journal.

# Water and improved livelihoods



**Coming together: 230 delegates attended the 9th Waternet/WARFSA/GWP-SA symposium**

By Zahira Kharsany

JOHANNESBURG, Oct 29 (IPS) - "Sanitation may hold the key to success or failure of the MDGs. It is really a time bomb in terms of health and the environment, waiting to be detonated," Professor Damas Mashauri told participants at a seminar on water and sustainable development taking place in Johannesburg, South Africa.

Water is a basic necessity, but more than 1.1 billion people across the world lack adequate access.

"That is not the only problem. People cannot access basic sanitation as well," says Mashauri of the University of Dar es Salaam.

"Some hard facts about access to various forms of sanitation in Sub-Saharan Africa are very scary."

According to Mashauri, 35 percent of Africans do not have access to sanitation of any kind. Fifty-three percent of Africans have access to a pit-latrine toilet -- their own or a neighbour's. Just eight percent have access to a flush toilet.

The professor delivered the keynote address

at the ninth edition of a water symposium sponsored jointly by WaterNet, the Water Research Fund for Southern Africa (WARFSA), the Global Water Partnership Southern Africa (GWP-SA) and the Southern African Development Community (SADC).

The symposium, which this year has the theme "Water and Sustainable Development for the Improvement of Livelihoods," brings together delegates from across southern and eastern Africa.

Reginald Tekateka, the regional chair of GWP-SA, explained that the purpose of the symposium is to promote interaction among policy makers, academics, practitioners and those involved in the water sector as well as to look at areas that need further research and support. "The symposium places emphasis on integration of knowledge."

Mashauri pointed to a long history of developing water policy, beginning with a 1977 meeting in Argentina which led to the declaration of the 1980s as International Water Supply and Sanitation Decade. But referring to the theme of the present conference, he suggested

*"Some hard facts about access to various forms of sanitation in Sub-Saharan Africa are very scary."*

"Looking back over the United Nations time tunnel, conferences that were held played an important role in global policy making. This started in Argentina in 1977. In 1992 the Dublin Principles were conceived. But there is still no evidence on the ground of improved livelihood," Mashauri explained to the delegates.

Drawn up ahead of the 1992 United Nations Conference on Environment and Development in Rio de Janeiro, the Dublin Principles urged a participatory approach to the development and management of water resources. Water, they state, is a finite and vulnerable resource, essential to sustain life and the environment; it has an economic value in all its competing uses and should be recognised as an economic good; and women should play a central part in the provision, management and safeguarding of this precious resource. The challenge ahead, said Mashauri, is greater investment in the sanitation sub-sector. "We need water and sanitation infrastructure financing, water conservation and equitable distribution." --IPS

(For more stories on water and development, visit the following link: [http://ipsnews.net/new\\_focus/saf\\_water/index.asp](http://ipsnews.net/new_focus/saf_water/index.asp))

# Setting a research agenda for the Zambezi IWRM strategy

By Leonissah Munjoma

The Zambezi River Basin took centre stage on the first day of the Symposium when researchers and policy makers met in a special session to discuss the Basin's Integrated Water Resources Management (IWRM) Strategy.

The need to ensure research plays a role in the implementation of the Strategy was emphasised as participants recognised that without research, development would not take place in an informed manner.

It was agreed that there were more questions than answers as evidenced in the failure to develop infrastructure to meet the basin's and region's water security.

Researchers had a duty to provide these answers through further interrogation of the issues raised.

Through broad based stakeholder participation, the Riparian States of the Zambezi developed an IWRM Strategy that spells out development opportunities, key challenges that need to be addressed as well as providing a framework to share the benefits derived from the basin's water resources equitably.

Addressing the session, Dr Jeffer Sakupwanya said doubts about facts frustrate international cooperation in the management of shared transboundary water resources adding that knowledge is vital to water managers for them to make informed decisions.

"There is need to develop science based guidelines and identify good practice in achieving the strategy outcomes. There is need for both fundamental and applied research as well as investigator driven and strategy-driven research," Dr Sakupwanya said.

He said the four key challenge areas highlighted in the Zambezi River Basin required further interrogation in a way that would provide answers to some questions. The IWRM Strategy has outlined four key challenge areas in the river basin.

These are:

- Integrated and Coordinated Water Resources Development
- Environmental Management and Sustain-



**Coming together: 230 delegates attended the 9th Waternet/WARFSA/GWP-SA symposium**

able Development

- Adaptation to Climate Variability and Change

- Basin-wide Cooperation and Integration

The objectives of the Special session on the Zambezi were to:

- present the information in the Zambezi IWRM strategy to the water research community in the region

- discuss the key elements of the IWRM strategy and the recommended actions with the water research community in the region.

- explore, define and establish the research agenda to assist the operationalization of the IWRM strategy.

- discuss and agree on the actions the region's water research community

The Session also sought to provide researchers with an opportunity to make an input into the Zambezi IWRM Strategy Implementation process and to define the niche for research in its operationalization.

Some of the questions that researchers could consider include the following:

- Why there is inadequate investment in the water sector?

- Why continue with pricing and charging schemes that do not ensure the financial sustainability of water investments?

- Where are the policy and regulation bottlenecks?

- Are the water resources that have been developed being used equitably and efficiently?

- What is the impact of the human element on all this?

The session agreed that for research to be effective, it was important that the Zambezi Watercourse Commission (ZAMCOM) Agreement is ratified and the Secretariat established.

The researchers came up with a list of priority areas for research and called on the GWP SA, the convener of the Special Session to follow these up:

- Develop a research Strategy for the Zambezi river basin to complement the IWRM Strategy

- Research into the cost of not ratifying the ZAMCOM Agreement

- increase knowledge in improved water resources management

- Exploration of new data sources

## Communities' voice in water management

By Tafadzwa Sekeso

When communities' everyday lives are threatened and they perceive themselves as victims of the powerful, the political nature of water resources management kicks in thus creating political controversies between the state and urban authorities on the management of water.

But at the same time see themselves as not being totally weak as to be unable to do something.

Such is the case in Bulawayo, Zimbabwe, where the urban community resisted

Government moves to have Bulawayo Water and Sewerage Services handed over to the Zimbabwe National Water Authority (ZINWA).

"ZINWA was seen as representing the governments' interests and introducing new policies they did not have the capacity to execute as a result the community rejected the new proposed structure for water management in Bulawayo," said Colin Mabiza, who presented a research paper titled *The political Nature of Water Resources Management Insights from Bulawayo and the Mzingwane Catchment Area, Zimbabwe*, at the Symposium.

The Zimbabwe government took a decision in 2006 giving ZINWA the mandate to take

over water and sewage delivery services in cities and towns. The directive to ZINWA was justified on the grounds that water and sewer services in most urban areas of the country were deteriorating. Some towns had actually asked ZINWA to takeover their water services, and a Joint Task Force set up to investigate water shortages and sewer problems in Harare had also recommended that ZINWA takes over these services.

The position of ZINWA in providing water and sewer services was seen as being strong because the national water authority was already providing water to 'growth points and other small rural service centres in the country.

The main arguments in support of the takeover were that the takeover would benefit the residents in that funds for the development of the water sector would be channelled through one government department, instead of being parcelled out through individual local government authorities. It was also envisaged that ZINWA would be able to use economies of scale and cross subsidies to cushion the poor in society. It was also argued that consumers would be assured of a reliable, safe and sustainable water and sewage delivery service. Immediately after the directive was issued

ZINWA took over water and sewage delivery services in most major towns including Harare. Moves to take over the services in Bulawayo commenced in early 2007.

These conflicts were primarily because the community perceived, on the one hand, the problems which the city was facing had nothing to do with incompetence or inefficiency on the part of the local authority, but were due to the general socio-economic problems which the country was facing. On the other hand, the government was perceived not to be sincere in its move, and the move itself was seen as being politically motivated. The resistance took the form of a sustained campaign which rallied residents against the move. While research has indeed shown that in most cases there have been no significant shifts in the nature of participation in stakeholder institutions, this paper has shown that participation in water resources management does take place when stakeholder interests are threatened.

"This paper has shown where residents are actively involved and engaged in matters that concern their everyday lives they become aware of pertinent issues in water resources management and actively participate," said Mabiza.

## Gold mining's effects on Tanzania's water

By Tafadzwa Sekeso

Despite reducing the levels of unemployment in communities, increasing Gross Domestic Product (GDP) and foreign exchange earnings for the country, gold mining has caused more harm than good in Tanzania.

Seeking the precious stone, gold, in Tanzania has caused more harm than good.

"Water quality in the Bulyanhulu River [in Tanzania] has been compromised due to weak disposal of waste rock, tailings deposition, effluent discharges and heavy metals from sulphides and silicates," said Grace Nkuli in her research presentation at the Symposium, titled *The Effects of mining activities on water quality of Bulyanhulu River: Bulyanhulu Gold Mine Shinyanga -Tanzania*

This need to investigate the quality of water of the Bulyanhulu River came about due to:

Community dependence on the river for

domestic and agricultural use, which is potentially prone to contaminants from the mining areas thereby creating health risk potential; provide water quality data that may assist in the development of appropriate water quality monitoring and surveillance programmes and eventually improve local water quality.

The main objective of the research paper was to assess and analyse the levels of pH, SO<sub>4</sub>, Fe, Ni and Zn pollution in the Bulyanhulu river and: Investigate possible impacts of the mining activities at Bulyanhulu Gold Mine on river water quality with respect to the selected parameters; to compare the levels of these parameters to standard and guideline values of Tanzania and the World Health Organization respectively

The research also concluded that Bulyanhulu River was significantly affected by mining activities with respect to Ni, Fe and Zn, that

exceeded the recommended limits, which makes the water unsuitable for human consumption, as well as, potential risks on aquatic life and on human health through consumption of fish, and crops irrigated by water from the river.

Although the mine has been very cooperative in improving its disposal of waste the research did recommend that: The mine should treat the effluent of the effluent control ponds by precipitating out metals thus reducing their mobility through seepage; construction of additional ponds with adequate retention times that can enhance the removal and retention of metals is also suggested; lime and caustic soda should be added to the effluent control ponds to neutralize the acid mine drainage and to elevate pH; further research should be conducted in both seasons wet and dry to assess the seasonal variation of the pollutants.

# Wastewater not a waste of water

By Saaleha Bamjee-Mayet

Increasing water shortages and the threat to food security, especially among urban and resource-limited farmers has led to the use of wastewater in agriculture to become a more common and widespread practice.

Fungai Makoni of the Institute of Water & Sanitation Development (IWSD) said that wastewater is an important resource for urban irrigation. "Most urban utilities generate a lot of wastewater from their treatments plants which they have problems in managing. There is the potential of wastewater to contribute to the improvement of livelihoods and employment opportunities," Makoni said.

"Wastewater contains nitrogen and phosphorus which may result in higher yields than freshwater irrigation without additional fertilisers," Makoni said. However, wastewater contains chemical pollutants such as heavy metals and pathogens. "The World Health Organisation has published guidelines for the safe use of wastewater and excreta in agriculture and aquaculture to protect the public.

These obstacles to wastewater use are real but not insurmountable," he said.

This notion was fortified by two other presentations by L. N Dlamini and T. I Nkambule, both from the University of Johannesburg. They presented laboratory findings on alternative techniques to remove water impurities.

Dlamini showed how the synthesis and characterization of Bimetallic Nanoparticles on polymers could be responsible for the removal of organic compounds in water while Nkambule looked at the removal of natural organic matter from water using ion exchange chromatography and cyclodextrin polyurethanes.

Makoni pointed out how the benefits of using wastewater had been investigated in various parts of the world and showed how peri-urban farmers in Kumasi, Ghana were reported to be generating revenue as high as US\$6 million (US\$500/ha/yr) with profits of at least US\$4 million from irrigation of vegetables using wastewater.

Quoting from a study done in Bulawayo, Zimbabwe, Makoni said those peasant urban

farmers engaging in urban agriculture through the use of wastewater improved their quality of life through income generation and food security for their households.

"The Luveve Gum Plantation farming area is located about 12 Km West of the Bulawayo city centre and is 350 ha in size. Effluent is derived from residential suburbs. The economic valuation of benefits from wastewater used concentrated on the conventional market based approach method, which was only asking how much the farmers get from their produce in relation to the market price of the product. The money earned was used on things like medication and school fees among other things." Makoni said potential exists for improved livelihoods which is largely depend on adopting appropriate strategies at optimizing crop yields and quality, while maintaining soil productivity and safe guarding the environment "However there is need of a more detailed economic study to ascertain the direct and indirect contribution of wastewater use for agricultural purposes," he said.

# Climate change affects livelihoods

By Saaleha Bamjee

A study aimed at assessing farmers' perceptions on climate change and adaptation strategies in Malawi, has revealed that that livelihood activities had been negatively affected and left different groups vulnerable at various levels.

The high dependence of rain fed agriculture in the region makes it highly vulnerable to climate change and variability, a session at the Symposium was told.

A group of researchers who carried out the study focused on farmers in the Nessa Village in Mulanje District, Southern Malawi, found that the rural community are aware of climate change and variability.

"Ninety percent of Malawians are predominantly engaged in subsistence rain-fed agriculture," Cosmo Ngonondo, one of the researchers who undertook the study said. The other researchers were from the universities of Malawi, Dar es Salaam, Greenwich and the MATAMA-NGO.

"Smallholder agriculture underpins most rural livelihoods and national economies in most Sub-Saharan African countries. In Malawi, 60% of them are food insecure on a year-round-basis and 90% of export earnings are derived from agriculture."

She said worsening poverty and increasing food insecurity is closely linked to low or declining levels of agricultural productivity.

"Extreme climate events such as drought, floods, strong winds, and landslides have intensified in Malawi. Crop failure has led to food insecurity and malnutrition. There is a need for serious effort on identifying, understanding and enhancing sustainable adaptation," Ngonondo said.

"Rainfall variability and occurrence of extreme events are now more pronounced in terms of the onset and cessation of the rain season. For example, 2006 had no winter rains, rainfall has been intense for a few months with an increased frequency of drought and flood events," she said.

Farmers noted there are now more months of sunshine than in the past. They also observed that the cold months had changed. "Previously cold months were from May to August but now sometimes reach October. These variations in rainfall and changes in temperatures have been more pronounced since 2002."

Women farmers appeared more sensitive to the observation of climate changes as they are the ones most concerned with food security, while the men were involved in agricultural production on the tea growing estates where they were employed, Ngonondo said.

The study found that the adaptive coping strategies to climate change differed by wealth ranking in extreme events like droughts.

"The poor relied on being casual labour to the rich and estates. Some begged for food and money while others collected and sold firewood. Most of these coping strategies are not sustainable," she said.

Better and sustainable adaptive strategies would include irrigation, livelihood diversifi-