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Water scarcity and security including the role of groundwater



Some of the delegates who attended the International Conference on Groundwater

The challenges which countries such as South Africa (SA) face in their efforts to achieve and sustain water security are determined by many factors such as the natural hydrological environment determines the absolute level of water resource availability, its spatial and temporal distribution and variability.

According to England-based international researcher, Phillip John Chilton, the socio-economic environment including the structure of the economy and the behaviour of its participants will reflect legacies, influence policy choices including determining the capacity to develop water infrastructure and manage water resources to improve availability.

Chilton noted this during a ground-breaking three-day International Conference on Groundwater that was held at the Centre for Scientific Innovation and Research (CSIR) in Pretoria from Monday, 19 September 2011.

Changes to the future environment, according to Chilton, resulting from climate change are likely to have a significant impact on both productive and destructive capacity of water.

Water shortage is used to describe an absolute shortage in which volumes of available water do not meet certain defined minimum requirements. The United Nation (UN) Food and Agriculture Organisation (FAO) regards water as a severe constraint on socio-economic development and environmental protection if the mean volume of internal renewable water availability is less than 1 000m³/capita. "Where mean availability is less than 2000m³/capita, water is regarded as a potentially serious constraint which could become a major problem in drought years."

Chilton noted that water scarcity is a much more relative concept which describes the relationship between demand for water and its availability, and therefore immediately takes on a social and economic dimension. Water demands vary considerably between countries and between regions within a country depending on the amounts of water used by different sectors. "A country with a high industrial

DWA scoops another top award

DWA was in the limelight again when its exhibition stand was announced as the best among others during the Institute of Municipal Finance Officers (IMFO) Conference held at the International Conference Centre (ICC) in Cape Town recently.

The IMFO conference was held from 12-14 September and the theme of the conference was "**Financial Sustainability Beyond.**" The Departmental stand won an award for the most impressive shell scheme set because of the kind of information distributed and the exciting activities that took place.

The RPMS component under Chief Directorate Water Services (WS) was exhibiting during the conference that was attended by Mayors and Councillors, Municipal Managers, Municipal Chief Financial Officers (CFOs), officials from various government Departments and the private sector.

DWA's WS for Regulation and Sector Development unit was also represented, as a directorate that is related to the finances and economics of municipalities.

demand or which depends on large scale of irrigation will become more likely to experience times of scarcity than a country with similar climate conditions, but without such demands."

Water stress is the consequence of scarcity which may manifest itself symptomatically by increasing conflicts over sectoral usage, falling service levels, failure of arable crops and livestock farming, food insecurity, malnutrition, death, environmental degradation, displacements of communities and creation of refugees.

The more desirable situation of water security means reliable and secure access to water over time. This does not necessarily equate to a supply of constant quantity, but more to its predictability, which enables water conservation measures to be taken in times of scarcity to avoid stress.

Chilton noted that the role of groundwater in these situations is that groundwater storage sustains groundwater supplies and this process provides the buffering through dry seasons and droughts which helps to ensure water security. "Moreover, like surface water storage, groundwater can be manipulated and enhanced by managed aquifer recharge schemes which build infrastructure or modify the landscape to increasing groundwater recharge to providing additional storage. Again, like surface water, groundwater adds an important operational dimension within the overall integrated management of land and water resources."

In terms of delivering water security in a groundwater context, Chilton noted that it is important ensuring that the groundwater resources utilised are sustainable, needs knowledge of the quantities of the resource available in terms of stored volumes and annual replenishment from recharge – helping to avoid the physical water scarcity referred to earlier.

In conclusion, Chilton added that enhancing the volumes of stored water can provide significant buffering against extremes of water variability because this is the key to attaining national water security and sustainable development. "Conversely, weak national capacity to invest in increasing storage maintains drought susceptibility and persistent poverty.

Another international speaker, Professor Stephen Foster, noted that in Sub-Saharan African countries, the strategic agenda of the water sector is undergoing substantial changes because of demographic pressure, climate change and economic transformation.

Foster pointed out that groundwater is the critical underlying resource for human survival and economic development in extensive drought-prone areas across the African continent. The accessibility of groundwater in dug-wells, springheads and seepage areas has always controlled the extent of human settlement beyond the major riparian (along river banks) tracts – and the widespread introduction of drilling rigs and water pumps since 1970s to enhance human activity.

Professor Willi Struckmeier, President of the International Association of Hydrologists (IAH) explained that groundwater quality has numerous facets. In many regions of the world, natural quality of groundwater is fit for human consumption and meets drinking water quality standards of the World Health Organisation (WHO).

Ike Motsapi

The reason for DWA to attend such a conference was to get clear understanding and direction regarding the finances and economics of local government, to give the Department a clear understanding of what is needed when planning to assist, regulate and execute Local Government imperatives.

The speakers among others included Deputy Minister of Finance, Nhlanhla Nene; City of Cape Town CFO, Mike Richardson; Terence Nombembe, Auditor-General, Gciniwe Fakudze from Swaziland, Patrick Roy Mnisi from Zimbabwe and many others from different organisations throughout the world.

DWA recently got an international award from the International Water Association for its Blue Drop Certification during the 3rd Water Quality Conference that was held also in Cape Town recently. The Learning Academy recently came second in the Best Public Sector Training Programme Category of the Achiever Awards.

Ike Motsapi

CELEBRATE NATIONAL HERITAGE DAY: 24 SEPTEMBER

Public Service Week celebration

South Africa has been celebrating Public Service Week (PSW) which started from 19 – 23 September under the theme “**Transformative leadership in public administration and governance: Creating a better future for all.**”

The PSW is used as a platform for participation and engagement for the delivery of quality public services. The main objectives of the celebrations are to assess the impact of public service delivery and implementation of Batho Pele policy, open a dialogue for sharing best practices to find solutions, while promoting Knowledge Management practices as well as to fight corruption effectively in the public service.

This year's PSW intended to attract participation from Ministries, public servants across the three spheres of government, state owned enterprises, ambassadors and institutions of higher learning, civil society organisations and citizens.

PSW is an integral part of the Batho Pele (people first) movement aimed at instilling and/or rebuilding good ethics, morale and pride in public servants to encourage the culture of providing quality services. The week promotes inter-governmental relations by encouraging integrated approaches in rendering public services to effectively utilise limited government resources for improved results.

The platform further affords senior managers like Heads of Departments (HOD), Directors-General (DG) and political principals an opportunity to engage with

frontline staff and citizens to get a first-hand understanding of what transpires at different service delivery points.

Various activities took place in this year's celebration such as the deployment of senior managers to service delivery sites through Project Khaedu, which places senior managers at frontline offices; unannounced visits to service delivery institutions; service delivery exhibitions and creating awareness to enhance access to citizens by provincial and national departments. There was also a Senior Management Service (SMS) Conference where presentations were shared on ‘**My Public Servant, My Future**’, ethics and integrity as well as progress made on the work of the special anti-corruption unit.

PSW is an integral part of the Batho Pele Revitalisation strategy which seeks to instill and rebuild public servants' endeavours to translate the people's contract into reality through the provision of quality services that respond to the needs of the citizens. September is Public Service Month; it covers various strategic programmes across the public service, including the GovTech Conference that took place from 11-14 September, PSW, from 19-23 September as well as Public Service Trainers Forum that will take place from 26-30 September 2011.

Gideon Shayi

Department warns illegal water users

DWA intends to clamp down on massive illegal use of water by irrigation farmers in the Vaal River System (VRS), where the Department aims to address 92% of possible unlawful use in VRS by March 2012 as its first priority.

This was among the decisions reported at the fourth meeting of the Strategy Steering Committee of the Vaal River System.

To date 244 million m³/a (cubic meters per annum) (180 million m³/a in the Upper Vaal Water Management Area (WMA), 34 million m³/a in the Middle Vaal WMA and 30 million m³/a in the Lower Vaal WMA) of the water is allegedly being used unlawfully in this system. This is over 15% of the total volume of water used in the VRS.

In addition, Government's quest for renewable energy resources could prove to be beneficial to the Vaal River System (VRS), because a water transfer scheme planned to augment the Crocodile (West) River System and the coal-fired power stations near Lephalale in Limpopo from the Vaal system has been postponed. This will reduce the water requirements in the VRS; however, to have sufficient water up to 2050, key strategies must also be successfully implemented.

It was also noted that the unlawful use of water by irrigation farmers has been identified as a practice which is putting the VRS water supply balance at risk. Validation of water use has been completed in the Upper and Middle Vaal Water Management Areas (WMAs) and has commenced in the Lower Vaal WMA.

On the issues related to Water Conservation and Water Demand Management, DWA has set WCWDM targets for all metros and municipalities within the Vaal River System which collectively amounts to a target of 15%. For this reason, municipalities are

busy in the process of implementing various WCWDM activities of which some are even financially supported by the DWA. However, metros and municipalities should make a concerted effort to expedite their implementation efforts to meet the target by 2014.

Workshops between the Gauteng Departments of Local Government and Housing and the various municipalities were held to facilitate the financial prioritisation by the municipal CFOs to prioritise budget allocations for their WCWDM initiatives. The largest four water users, the City of Tshwane, the City of Johannesburg, Ekurhuleni Metro and Emfuleni Local Municipality are reporting on their WCWDM efforts to the strategy steering committee.

The integrated Water Quality Management (WQM) Strategy for the VRS has identified salinisation, eutrophication and microbial pollution as the three major causes of deteriorating water quality that require attention. In order to maintain and/or improve the water quality in the system, the Department is implementing various management interventions which include the determination of in-stream fitness-for-use Resource Water Quality Objectives, improving source controls to prevent and minimise water pollution at source and improving management of the water resources through more effective monitoring, assessment, reporting and management participation.

The establishment of the Vaal River Integrated WQM Strategy Implementation Committee should assist and provide more impetus and momentum to WQM efforts in the VRS. The Inter-Ministerial Committee on Acid Mine Drainage (AMD) appointed a Team of Experts (ToE) to help deal with the AMD situation in the Witwatersrand. The tasks of the ToE included reappraising the risks posed by AMD; assessing available solutions and technologies; interrogating and assessing the viability and costs of critical short-term interventions; proposing integrated lasting and sustainable medium and long-term

solutions/measures as well as exploring possible partnerships with the private sector.

To implement certain critical short term interventions recommended in the ToE report, the Trans-Caledon Tunnel Authority (TCTA) was appointed in April 2011 to perform emergency work such as the installation of pumps for the extraction of mine water; construct three on-site treatment plants with an option to refurbish existing plants; install infrastructure to convey treated water to nearby watercourses and facilitate a model for the operation and maintenance of the pump stations and treatment works.

To achieve the above tasks, discussions with the relevant mines to use their infrastructure are currently taking place. Since the West Rand area is experiencing surface decant of AMD, an emergency solution that will increase the treatment of AMD from 12 million litres (ML) per day to 30 ML per day was recently approved and is expected to be commissioned by late 2011.

AMD may pose a risk to continued water supply security in the VRS due to excessive dilution-releases from the Vaal Dam that will be required to curb the effects of the associated salt loading on the VRS. For this reason, it is imperative that a long-term, sustainable solution is developed. DWA has initiated a process to commence with a feasibility study to address AMD in the long-term and is awaiting proposals from specialists.

Several other detailed investigations are being initiated by DWA which will focus on the potential risk of pollution in the Grootdraai Dam catchment. It will identify the most feasible long term options for dealing with AMD, undertaking a salinity study of the Orange River which will be used to develop integrated water quality management strategies of the Vaal River and Orange River systems.

Gideon Shayi

DWA to host GISc3 Workshop

DWA through Directorate for Spatial and Land Information Management component will be hosting GISc3 workshop in Head Office on 04 October 2011.

The workshop will be held under the theme “**Change is the only constant.**” The event aims to promote the use of Geographic Information System (GIS) that can be used as a tool to support spatial decision making in the Department. Various topics such as Data Management in ArcGIS 10, The Art of Map Communication, Tabular Data and Data Integration in ArcGIS 10, Datums, Projections and Coordinate Systems will be presented at the mini workshops.

Officials who are interested are requested to select one, from the two sessions which will be taking place in the morning and in the afternoon. All Departmental GIS and Remote Sensing users are invited to attend. The workshop will cover relevant GISc topics as well as coming to grips with ArcGIS 10.

Officials who are interested are urged to register online at http://intranet.dwa.gov.za/GISC3_Workshop/default.aspx

For more information please contact Helen Fourie at 012 336 7811

Gideon Shayi

SEPTEMBER 24 IS NATIONAL BRAAI DAY – CELEBRATE SA HERITAGE