WATER NEWS

2017/18 2ND EDITION

2 DAY

NUFFIC
TRAINING

NATIONAL
WATER WEEK

WORLD WATER
AWARDS

CAREER GUIDANCE
FOR LEARNERS IN
WATER RESOURCE MANAGEMENT

AQUATIC LIFE IN DAMS, RIVERS AND WETLANDS

INKOMATI-USUTHU
CATCHMENT MANAGEMENT AGENCY

14TH INTERNATIONAL WATER ASSOCIATION SPECIALIST CONFERENCE AT SKUKUZA CAMP

Vision

"Water for all in Inkomati-Usuthu"

MISSION

Our mission is of a pioneering catchment management system that empowers stakeholders to engage in consensual and adaptive decision making, to achieve reform, and to promote persistent social, economic, and environmental justice across the Inkomati-Usuthu Catchment.

- **The Inkomati-Usuthu CMA supports the co-operative management of the Inkomati basin as an internationally shared water course**
- **The decision-making environment of the Inkomati-Usuthu CMA, including delegated functions, enables collaborative action towards equity, sustainability and efficiency in a continually evolving socio-economic system**
- **The Inkomati-Usuthu CMA manages the resources adaptively, co-operatively and progressively to achieve social, economic and environmental justice, and promote healthy living**

VALUES

- The Inkomati-Usuthu CMA acknowledges the interdependence of our responsibilities for caring for the resource and there is explicit recognition of the diversity achieved by what individual/group contributes to promoting equity, efficiency, and sustainability as defined in the National Water Act
- Decisions, actions and outcomes are subject to performance evaluation against measurable goals, indicators and timeframes
- The Inkomati-Usuthu CMA strives for a trusting, transparent and corrupt-free system of catchment management that is cognisant of existing agreements and promotes fairness before the law, environment and economic development
- Management is adaptive, open to critique and outcomes driven, with solutions being practical, achievable and implementable
- The Inkomati-Usuthu CMA practices problem solving that embraces:
- Ethics of Ubuntu (our humanity is defined by how others experience our behaviour), Simunye (we are one) and Batho-pele (people first)
- Consensus driven stakeholder participation
- Decision within our mandate are made and are justified on the basis of the best available social, technical, economic, environmental and governance knowledge.

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(Pictures: Nuffic Training)

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FOREWORD

BY THE CEO

Dr Thomas Gyedu-Ababio

I say welcome to all of you to the new season. Water is a heritage that has been preserved for us. We should also ensure generations to come will benefit from it.

Our Forums are constantly engaging stakeholders on issues relating to water management. The six forums continue to serve as conduits of information to and from water users. We will not relent in our efforts to create awareness on issues of importance relating to water resources management. Our awareness programmes intend to empower all water users, irrespective of colour, creed, status or how resourceful one is in our water management area. We are supposed to be in the rainy season. We have received some rains but forecast received from our reliable sources cautions us against over expectation of abundant rainfall. We are therefore advising all our stakeholders to take precautionary measures to avoid waterborne diseases.

IUCMA has taken over the billing and collection of water resource management charges in our water management area. Collection rate was never satisfactory but we had to take over. We are asking all water users to be good citizens and co-operate by paying their water resource management charges to the IUCMA so that we can have the needed resources to manage the water resources effectively and efficiently. Some of our reliable stakeholders have started paying to us. We do appreciate your contributions.

In our bid to improve the aquatic ecosystem, biological monitoring has been added to our routine monitoring system. We have a team of specialists working of the health of the rivers and their related ecosystems. This is to provide extra assurance on the quality of our resource. Stakeholders will be informed of the status of our resource on a regular basis as we have been doing.

I once again say thanks to all of you, our stakeholders for your support over the years and we count on your support going forward. Enjoy the summer and let us all use water sparingly.

CATCHMENT MANAGEMENT FORUMS LEADERSHIP BY SUB-CATCHMENTS

CROCODILE CMF

- Chairperson: Mr Theo Dormehl
- Deputy Chairperson: Mr Greg Beyers
- Coordinator: Ms Debbie Turner

UPPER KOMATI CMF

- Chairperson: Mr Mashudu Gangadhze
- Deputy Chairperson: Prof Kevin Rogers

LOWER KOMATI CMF

- Chairperson: Ms Nombulelo Mkhize
- Deputy Chairperson: Mr Frank Madonsela
- Coordinator: Ms Dumisile Mthembu
- Additional member: Vacant

USUTHU CMF

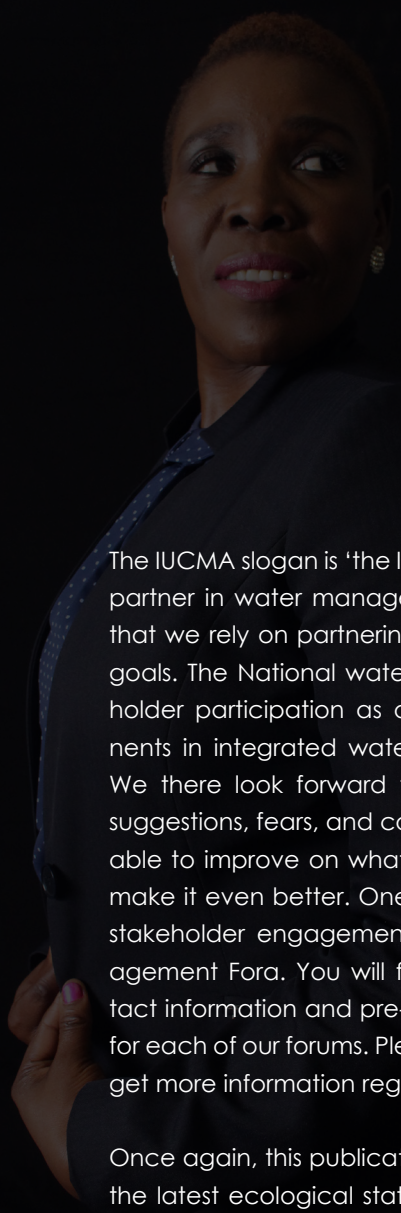
- Chairperson: Ms Miranda Sikhakhane
- Deputy Chairperson: Mr Shaun Campbell
- Coordinator: Mr Vusi Mnyandu

SAND CMF

- Chairperson: Mr Hamilton Mnisi
- Deputy Chairperson: Ms Faith Madzibile
- Secretary: Mr Speaker Mahlake
- Treasure: Ms Lizy Mthabini
- Additional member: Mr Reckson Mogakane

SABIE CMF

- Chairperson: Mr Sizile Ndlovu
- Deputy Chairperson: Mr December Ndhlovu
- Secretary: Mr Shadrack Gazide
- Deputy Secretary: Mr Themba Mashaba
- Additional member: Mr Douglas Mboweni
- Additional member: Ms Sinah Komane
- Additional member: Ms Pieter Maider
- Additional member: Mr Kobus van Nuwe Huizen
- Additional member: Mr John Mkhonto
- Additional member: Mr Jackson Mdluli



EDITOR'S NOTE

Dear valued stakeholders

It is always a pleasure to find time to compile something that I trust will be read-worthy to our valued stakeholders. The IUCMA always strive to do its best when it comes to its mandate of water resources management in the Inkomati-Usuthu Water management Area. We acknowledge that we can only achieve our best when you, our water users, play your part in the co-management of this precious yet finite resource.

First things first, please join me in congratulating our CEO, Dr Thomas Gyedu-Ababio, for having been listed as one of the 50 most impactful leaders in water management globally. More details regarding this prestigious award can be read on page 9. It is indeed our pride to be associated with a man of his caliber.

The IUCMA slogan is 'the Inkomati-Usuthu CMA, your partner in water management'. This simply means that we rely on partnering with you to achieve our goals. The National water Act also identifies stakeholder participation as one of the major components in integrated water resource management. We there look forward to hearing from you with suggestions, fears, and concerns so that we can be able to improve on what we are already doing to make it even better. One of our main platforms for stakeholder engagement is the Catchment Management Fora. You will find in this newsletter contact information and pre-scheduled meeting dates for each of our forums. Please get in touch with us to get more information regarding the forums.

Once again, this publication gives you a glimpse of the latest ecological status of the Sabie and Sand river catchments (you can find this on p.18). It is one of the core mandates of the IUCMA to maintain healthy ecosystems throughout the water management area. On an annual basis, the IUCMA embarks on a thorough study of at least one sub-catchment and compile a comprehensive report that is accessible to all stakeholders. Reports can be collected from our offices in hard copy or CD. Electronic copies can be downloaded from the IUCMA website.

I would like to thank each one of our water users for your valued contributions and constructive criticism. It is from this that we can grow and improve to serve you better.

Regards,

Sylvia Machimana

CATCHMENT MANAGEMENT **FORUMS**

Catchment management forums (CMFs) are voluntary non-statuary bodies with open membership providing a voice for catchment residents, particularly people who in the past have had little say over the management of resources.

The existence of catchment management forums means that other organisations do not have to set themselves up as consultative bodies, but rather should be represented in the local catchment management forum and may exercise their participatory requirements under the NWA through these forums. The forums are in position to explore water-related issues in their respective regions in a holistic manner, engaging with stakeholders through catchment management forums.

It is expected that these forums can serve as feasible platforms to ensure that a balance is found between the strong, frequently well-organised and resourced "voice" of large scale water users and relatively under resourced, less represented and organised small-scale water users. CMFs are appropriate vehicles to foster cooperative governance between the CMA's, local government, and other stakeholder interest groups, in the interests of integrated management to support Water Resource Management.

ITINERARY FOR CATCHMENT MANAGEMENT FORUMS INKOMATI-USUTHU CMA 2018/19

Forum	Date	Coordinator
Sabie CMF	07/05/2018	Ms Nomsa Maider
Sand CMF	09/05/2018	Ms Assah Thibela & Mr Solly Ndlovu
Lower Komati CMF	16/05/2018	Ms Liketso Khaile
Crocodile Catchment CMF	18/05/2018	Ms Gugu Motha
Upper Komati CMF	24/05/2018	Mr Tony Sibiya
Usuthu Catchment CMF	25/05/2018	Mr Sbonangaye Mkhatshwa & Mr Thabiso Nkosi
Sand CMF	13/08/2018	Ms Assah Thibela & Mr Solly Ndlovu
Sabie CMF	17/08/2018	Ms Nomsa Maider
Lower Komati CMF	20/08/2018	Ms Liketso Khaile
Upper Komati CMF	21/08/2018	Mr Tony Sibiya
Usuthu Catchment CMF	22/08/2018	Mr Sbonangaye Mkhatshwa & Mr Thabiso Nkosi
Crocodile Catchment CMF	24/08/2018	Ms Gugu Motha
Sand CMF	05/11/2018	Ms Assah Thibela & Mr Solly Ndlovu
Lower Komati CMF	07/11/2018	Ms Liketso Khaile
Sabie CMF	09/11/2018	Ms Nomsa Maider
Upper Komati CMF	12/11/2018	Mr Tony Sibiya
Usuthu Catchment CMF	13/11/2018	Mr Sbonangaye Mkhatshwa & Mr Thabiso Nkosi
Crocodile Catchment CMF	16/11/2018	Ms Gugu Motha
Sand CMF	11/02/2019	Ms Assah Thibela & Mr Solly Ndlovu
Lower Komati CMF	13/02/2019	Ms Liketso Khaile
Sabie CMF	15/02/2019	Ms Nomsa Maider
Upper Komati CMF	18/02/2019	Mr Tony Sibiya
Usuthu Catchment CMF	19/02/2019	Mr Sbonangaye Mkhatshwa & Mr Thabiso Nkosi
Crocodile Catchment CMF	22/02/2019	Ms Gugu Motha

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Mr Solly Ndlovu (Community Officer: Lower Sand)	078 459 0344	ndlovusolly@iucma.co.za
Mr Tony Sibiya (Community Officer: Upper Komati)	078 803 5276	sibiyat@iucma.co.za
Ms Liketso Khaile (Community Officer: Lower Komati)	078 459 0344	khailel@iucma.co.za
Ms Gugu Motha (Community Officer: Upper Crocodile)	078 459 0349	mothag@iucma.co.za
Mr Sbonangaye Mkhatshwa (Community Officer: Southern Usuthu)	061 337 2715	mkhathswas@iucma.co.za
Mr Thabiso Nkosi (Community Officer: Nothern Usuthu)	064 757 9254	nkosit@iucma.co.za

FROM INDIA-MUMBAI WITH AWARD
WORLD WATER *AWARDS*

Dr Thomas Gyedu-Ababio, named one of the 50 Most Impactful Leaders in Water & Water Management (Global Listing) at the WORLD WATER AWARDS held in India, 2018.

ACHIEVEMENT: *IUCMA's CEO Dr Thomas Gyedu-Ababio holds his certificate during the World Water Awards.*

WATER and related issues are at the top of the world's sustainable development agenda and are relevant to many challenges the global community is facing. This is particularly relevant to the availability and quality of freshwater resources, as well as the issue of access to drinking water and sanitation services.

The **World Water Leadership Congress** is guided by Leaders.... Leaders who believe in the value of CSR; that which is built in the fabric of business - making it a reality. Leaders produce Leaders program, a common thread uniting nations and people who take CSR more responsibly. They also believe that CSR is a tool to the Development of the Future. The **World Water Leadership Congress & World CSR Congress** aim at bringing over 130 countries under one roof to unite the best of the best and celebrate leadership in building a better society and a better world.

The originator - Dr R. L. Bhatia is a practicing Human Resources Professional, a Change Management and an Organisation Turnaround Specialist. He holds a Ph.D. in HRD from University of Missouri. Dr Bhatia's experience with Tata Group especially with Tata International Ltd. and Tata HRD Network, Standard Chartered Bank and Ernst & Young in senior positions won him recognition amongst CEO's, HR Heads and Marketing Professionals and many more.

The Advisory Board of World CSR Day advises on the eligible leaders who deserve awards. The World CSR Day scheduled on 17th & 18th February, 2018 at the Taj Lands' End - Mumbai is the largest rendezvous of CSR Leaders. The 2 Day Conference brings together 1200 Professionals from 133 Countries. Leaders at Apex Levels, Strategic Decision Makers and Peers who contribute to Learning and Development and Knowledge Management are a part of the 2 Day Conference. One of the key elements is a Book which is released on the Occasion of the event. The book Includes names of all Talent Leaders who are conferred with the **"50 Most Impactful Leaders in Water & Water Management (Global Listing)"** It is our endeavour to bring together like minded leaders at a Common Platform with the objective of Enhancing Knowledge, Networking and Meaningful Discussions.

➢ ***Selection of award winners***

- The **50 Most Impactful Leaders in Water & Water Management (Global Listing)** is intensely researched process undertaken by the research cell which consists of Post Graduates in History & Management with over 5 years research experience posts their studies. It is the iconic job of the research cell to produce a shortlist of Individuals who are doing extraordinary work and track the record of their achievements. The shortlist is then reviewed by a Jury comprising of senior professionals from across the globe. The Jury members included **Dr. R L Bhatia,** Founder, World CSR Day and World Sustainability.

- Dr Thomas Gyedu-Ababio was adjudged to be one of the top 50 most Impactful Leaders in Water and Water Management. Congratulations to the CEO of IUCMA. Well done.

WHAT THE IUCMA IS ALL ABOUT

Water Resource Management is all about balance, sharing and fairness

"The National Water Act says that water needs to be shared fairly among everyone who needs it and that it should be protected for our children and their children and so on. To do this, everyone must work together to manage water resources in a Sustainable, Equitable, and Efficient way".

1. WHO ARE WE?

The Inkomati-Usuthu Catchment Management Agency (IUCMA) is the water resource management agency in the Inkomati-Usuthu Water Management Area (WMA). It is established in terms of Section 78 of the National Water Act (Act 36 of 1998) to perform water resource management at local level. We are the **first Catchment Management Agency (CMA) to be established** in the country, established under Government Notice No.397 of 26 March 2004. The IUCMA is a **body corporate l**isted in Schedule 3A of the Public Finance Management Act No 1 of 1999 (PFMA) as a **national public entity.** Governing Board is accounting authority of the CMA. **CMAs are established to improve decentralised decision making with the stakeholders and thereby improve water resources management at local level.**

2. WHAT DO WE DO?

The IUCMA operates within the legislative framework of the National Water Act. Some of our functions include, but not limited to:

Inherent functions (s80) NWA

- Investigate and advise interested persons on water resource management
- Compilation of the CMS
- Co-ordinate related activities of water users and WMIs
- Promote co-ordination of implementation of any applicable development plan
- Promote community participation in water resource management

Additional inherent functions

- Prevention and remedying effects of water resource pollution as stipulated in section 19 of the NWA
- Control of emergency incidents in respect of water resource pollution as stipulated in section 20 of the NWA.
- the temporary use of existing authorised irrigation water in terms of section 25(2) of the NWA
- Appoint in terms of section 124 Authorised Persons to perform inspection and remedy functions in respect of water resources in terms of section 125(1) – (3)

Additional functions include:

- Section 34(2): To register an existing lawful water use subject to section 26(1) (c).
- Verification of existing WUs

- **Chapter 5 of the NWA**

- Sec 57 – Application of pricing strategy (making and receiving of WU charges)
- Section 124 - As WMI may appoint authorised persons
- Sections 125

- Authorised persons may enter and cross properties to:

- Do routine inspections of water use under authorisation
- Clean, repair, maintain, remove or demolish government water work operated by a WMI
- Undertake work for cleaning, clearing, stabilising and repairing water resource and protecting the resource quality
- Undertake work to comply with an obligation imposed on any person under the NWA in the case of failure by such person

- **Section 145 of NWA – Duty as WMI to report to public –**

- Flood which occurred or is likely to occur
- Drought which occurred or is likely to occur
- Water work which might fail or failed or might endanger life or property
- Levels likely to be reached by flood waters from time to time
- Any risk posed by the quality of water to life, health or property
- Any matter connected with water or water resources which the public needs to know
- **Section 34 -** Registration of existing lawful use
- **Section 35 -** Validation and verification

- **Section 40, 41, 42 and 44**

- Licencing process
- **Section 51, 52**
- Amendment of licences
- **Section 53, 54 ,55**
- Management of licences and licence conditions
- **Section 57, 58 -** Water charges

3. HOW DO WE DO IT?

A) INVOLVING THE COMMUNITY

The management of the resources entails protection, use, development, conservation, management, and control of water resources within the WMA as contemplated in the National Water Act (NWA). The National Water Act has 3 pillars i.e. Equity, Sustainability and Efficiency.

Everyone must take part in planning and making decisions about water resource issues that affect their lives. The IUCMA has established various platforms and processes to manage different factors affecting the catchment. Such platforms or processes intends to include everyone who may be affected. Various catchment forums are operating efficiently in all the sub-catchments. The forums are open, democratic and transparent, whereby everyone's voice counts. To ensure fairness in the processes, historically disadvantaged individuals are constantly being trained and empowered in water related issues so that they can make informed decisions.

B) MAKING SURE THAT THE WATER STAYS HEALTHY

Water quality samples and variable analysed and shared with stakeholders. All activities within the water management area are inspected and numerous follow up inspections conducted to ensure that the reported or identified transgressions are remedied. Water quality monitoring; physical, chemical and biological is of prime importance to the IUCMA. Water samples are taken on a regular basis for chemical and microbiological analysis. The bio-monitoring of the rivers in the WMA is an important part of our monitoring activities. Checking the health of the plants and animals in and around a river is also a good way to ensure that the quality of the river water is fit for its intended uses. This is done through a dedicated unit "River health" equipped with a team of suitably qualified individuals under the directorate of Water Resource Protection. Wetlands rehabilitation advisory services are provided to various stakeholders including mines – after such studies.

C) REGULATING WATER USE

To make sure that there is enough water for everyone who needs it, the IUCMA has to make sure that everyone follows the rules about water use by doing the following: sharing knowledge and expertise on hydrological data network, sources and data acquisition; real time measurement of water quality; maintaining water resources information management database; using strategic adaptive management for river operations; establishing a Flood Forecasting and Warning System for the Crocodile River Catchment. IUCMA has a successful operations committee that has brought the stakeholders together and has installed and maintain several real time runoff and rainfall gauges to improve the coverage for real time operations.

Stakeholder empowerment workshops are held to make sure that all concerned individuals are equipped with knowledge needed for taking part in water resources management regardless of their historical or educational background. To make sure that all water users adhere to the NWA, they need be in possession of a valid water use licence to be able to abstract water from the resource. The IUCMA needs as much information as possible to ensure that the catchment is managed properly in support of sustainable economic and social development. It monitors social, technical, economic, environmental, and political (STEEP) factors related to water resource management in the water management area.

D) CO-OPERATIVE GOVERNANCE

All sectors, organisations and individuals must work together towards the same goal of making sure that the catchment is used Sustainably, Equitably, and Efficiently. A dedicated unit of Institutions & Participation exists to make sure all stakeholders are mobilised to take part in decision making relating to water management in the water management area.

Know more about aquatic life in Dams, Rivers & Wetlands




Article by (from left to right) Mr Marcus Selepe, Mr Mthobisi Soko, Mr Mahlodi Dikgale and Mr Bheki Cele from Water Resource Protection and Waste

The Importance of aquatic life in Dams, Rivers and Wetlands

Freshwater bodies such as Dams, Wetlands, Lakes and Rivers are regarded as aquatic ecosystems. These provide habitat for a wide range of aquatic biota including fish, macro-invertebrates and plants. They form an intricate food chain which results in a dependence upon each other for survival. The importance of such an ecosystem can not be overemphasized considering that freshwater represents approximately 3% of all the total water available on earth.

What role does aquatic life have in the ecosystem?

Aquatic ecosystems are important in the provision of ecosystem goods and services. This includes foods security, flood attenuation, water purification, groundwater recharge, nutrients recycling, and habitat provision. And most importantly, provision of water, which is recognized as an important natural resource. Freshwater ecosystems aid in food security through provision of food such as fish, which can be used for both subsistence and commercial purposes. The importance of a reliable water supply in agriculture for food production can not be ignored. Wetlands are important natural features which aid in flood attenuation, water purification and through their sponge-like absorbing ability, they help with groundwater recharge.

What are the threats or dangers concerning aquatic life?

Freshwater ecosystems are under severe pressure from anthropogenic and natural activities. Anthropogenic activities refer to man-made activities which results in negative changes to both the habitat and biota in an ecosystem. These include pollution emanating from mining, agricultural and industrial. Such activities introduce pollutants into water bodies which cause deterioration of water quality. Other activities such as wastewater treatment works introduce micro biological organisms such E. coli in the water. All these activities render water unusable for any purpose and the expense of treating the water prior to use are increased. The degradation of wetlands due to developments present added threats to aquatic ecosystems. Wetlands are important natural filters of water and their degradation leads to deteriorating water quality. Other threats include overutilization of water, overfishing and introduction of invasive species which ultimately disrupt and displace indigenous populations of biota.

Natural activities such as flooding, drought and climate change also present unavoidable threats to aquatic ecosystems. Flooding and drought are recurrent climatic events in arid regions such as South Africa. Floods lead to deterioration of habitat through sedimentation and subsequently affect biota depending on the available habitat. The severity of environmental and structural damage caused by floods are generally increased by the degradation of wetlands. Drought, on the other hand, leads to reduced water quantity in dams and rivers, and as a result affect habitat availability and biota. Climate change is recognized as an emerging threat to aquatic ecosystems with a significant change in temperature expected to cause disturbances in pollution and ecosystems in general.

Improving Equity in Access to ***Water*** *for Productive Purposes*

Article by Mr Hasani Makhubele from Institutions & Participation

The IUCMA in partnership with Pegasys Institute has embarked on a project in order to address the unequal access to water for productive purposes for black rural women and men in the Inkomati-Usuthu Water Management Area (IUWMA).

This project aims to find effective ways to redistribute water to achieve economic development in rural communities, and to help redress the inequality in access to water for productive purposes. The idea of the project is to work with communities to identify their needs, provide skills, develop business plans with them on how to use the land, link them to markets and partners for continued support.

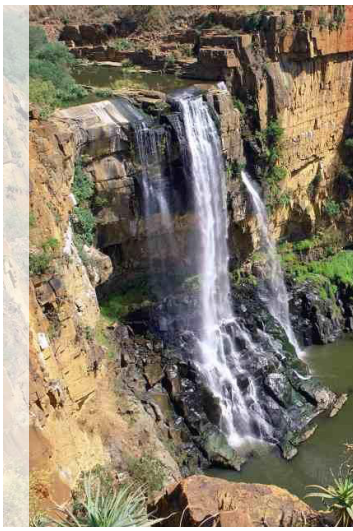
The objective of the project is in two folds:

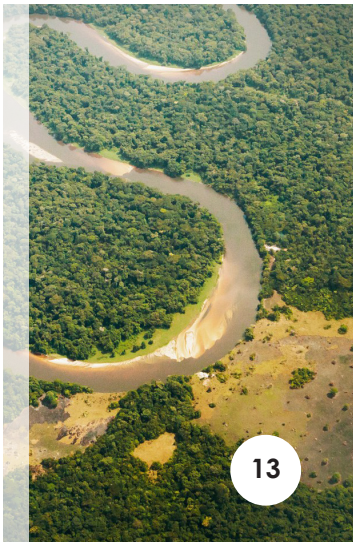
1. Firstly, to identify effective and implementable mechanisms in line with the National Water Act, for allocating and re-allocating water to black, rural communities;
2. Secondly, to work with selected communities in the IUWMA to identify and address their needs in terms of water for productive purposes, including, where appropriate, the disbursements of small grants to assist communities in obtaining access to water for productive purposes.

The Mswati Communal Property Association (CPA) is one of the identified projects within the IUWMA which displayed a potential to benefit from this project. After a thorough assessment was conducted, it was found that there was a dire need for infrastructure and financial support to upscale the use of the water in the Mswati Farm which is located in the Upper Komati system.

Amongst the major activities of the project, which will be implemented in close co-ordination with the other departments in the Mpumalanga Province and local communities, were to examine practical and feasible options under the National Water Act for allocation and re-allocation of water to rural black communities, and development of practical tools to support this. Through the Institutions and Participation division in the IUCMA, engagements with relevant stakeholders and authorities such as the Department of Agriculture, Rural Development, Land and Environmental Affairs (DARDLEA), local NGOs, etc were initiated. This was done in order to enable sustainable support and to build capacity in the communities around water issues.

As a result of these committed engagements and interventions by the project role players, an MoU between Vumelana Advisory Fund and the Mswati CPA was concluded and an investment letter of intent was also obtained from established private investors. This ultimately resulted in Vumelana Advisory Fund facilitating the lease agreement being signed between the two entities, Mswati CPA Agricultural Development and the private investors who are aiming to develop 300 hectares for itself and also to assist the CPA farmers to develop additional hectares. Currently, the Mswati farm only has 164 hectares of Historic Lawful Use Water. As such the private investor can only develop 150 hectares for their own farming operation.





RIVER OPERATIONS WEB PORTAL

The Inkomati-Usuthu Catchment Management Agency is committed to bring you all the information you need to enable you to use water wisely and considerably. The IUCMA has established a web portal for River Operations that brings you the daily flows of the water in the Catchment. To gain access to this information, please log on to

www.iucma.co.za

The link to the River Operations portal is located on the home page of the IUCMA website.

VALIDATION AND VERIFICATION OF EXISTING LAWFUL USE

The purpose of the National Water Act (Act No. 56 of 1998) hereafter referred to as 'The NWA' is to ensure that the nation's water resources are protected, used, developed, conserved, managed and controlled in a manner that promotes equitability, efficiency and sustainability for present and future generations.

The NWA permits water use that was lawfully exercised under any law during a period of 2 years before the commencement of the NWA to continue under existing conditions until such time as it is formally licensed. This use is termed existing lawful water use (ELU) and the 2 year period between 1996 and 1998 is termed the Qualifying Period (QP)

The first legal requirement that was asked of existing users in terms of The NWA was to register their water use. The call for Existing Lawful Water Users to register was made in the Government Gazette on 12 November 1999 in terms of Section 26 (1) c of The Act. Users were made aware upon registration that the lawfulness of the water use is still to be determined during the validation and verification (V&V) process.

The current V&V project of the Department of Water and Sanitation through the IUCMA seeks to determine and ultimately declare this ELU on all registered properties within the Inkomati-Usuthu Water Management Areas (WMA). Unregistered users also have the opportunity to have their ELU verified and a late registration penalty will apply.

The validation for the Inkomati catchment has been successfully completed and the verification is in its final stages while the project for the Usuthu catchment started in November 2016. The Inkomati project is a continuation of the previous ICMA/WRP&P/VERIFICATION/2011 project which ensured that all the data and legal requirements were finalised in order to manage and commence the production and distribution of the required letters to effect the Section 33 declaration of water use as ELU and Section 35 Verification of existing water uses processes of the NWA.

The validation part of the project uses remote sensing techniques such as satellite, aerial photographs and land saturation images to determine the amount of water that was used during the QP in terms of the following water uses under section 21 of the NWA:

(a) taking water from a water resource;
(b) storing water; and
(d) engaging in a stream flow reduction activity contemplated in section 36 of the NWA,

Verification is the process of confirming if the volume of water that was used during the qualifying period was lawful or not under the previous water legislation. This process is done in consultation with the water user.

Upon successful completion of the process, water users are issued with a lawful water use certificate which is followed by a new or amended registration certificate.

All section 21 (a), (b) and (d) water users within the Inkomati WMA (whether registered or not) who have what they believe to be ELU which has never been verified or authorized in any other manner post 1998 and have not yet received notices to apply for verification of their ELU from the IUCMA should kindly contact the IUCMA on verification@iucma.co.za.

Learn about water irrigation and make a change to save water

What is irrigation?

Irrigation is the application of controlled amounts of water to plants at needed intervals. Irrigation helps grow agricultural crops, maintain landscapes, and revegetate disturbed soils in dry areas and during periods of less than average rainfall.

Environmental impact of irrigation

This may cause the following issues: rising water tables. increased storage of groundwater that may be used for irrigation, municipal, household and drinking water by pumping from wells. waterlogging and drainage problems in villages, agricultural lands, and along roads - with mostly negative consequences.

What are the advantages of irrigation?

Installing an irrigation system may seem like a costly endeavor, including the labor involved, but sprinkler or drip configurations have several advantages.

- Prevents Disease and Weeds
- Conserves Water and Time
- Preserves Soil Structure and Nutrients
- Gardening Flexibility

How irrigation works?

It carries important nutrients from the soil and is an important trigger for germination and the process of photosynthesis. Without water, plants simply won't grow. Surface irrigation such as border irrigation, furrow irrigation and other forms of irrigation that use flooding.

PROVIDING ACCESS TO CLEAN WATER A PRIORITY

The Inkomati-Usuthu CMA has to ensure proper management of the resource at the local level involving stakeholders. We do not provide water services, but work with water services, making sure the resource that they use and give to people is protected, clean and safe.

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The IUCMA investigates and advise as well as empower stakeholders on water use, and do verification and validation to authorise whether people have the right to use water. The IUCMA must monitor water allocation, which is a challenge as the Kwena Dam that supplies an area from Nelspruit to Mozambique isn't big enough to release water for all the people. The impact of drought on our planning activities in the past year has been bad for us. We have international obligations to honour, with an agreement to supply a certain volume of water to the other side of the Crocodile and Komati rivers across the Mozambique border. We don't have enough water storage for the region, as we also share water with Swaziland and Mozambique.

As the first CMA in the country, we are proud of what we have achieved so far. The compilation of the CMS; Reducing pollution in the water management area; Empowering stakeholders, especially the Historically Disadvantaged Individuals to understand issues of water resources management and legislation; Verification and Validation of water uses; Water Use Authorisations and bringing stakeholders together. We have also assisted schools by providing water as part of our Corporate Social Investment.

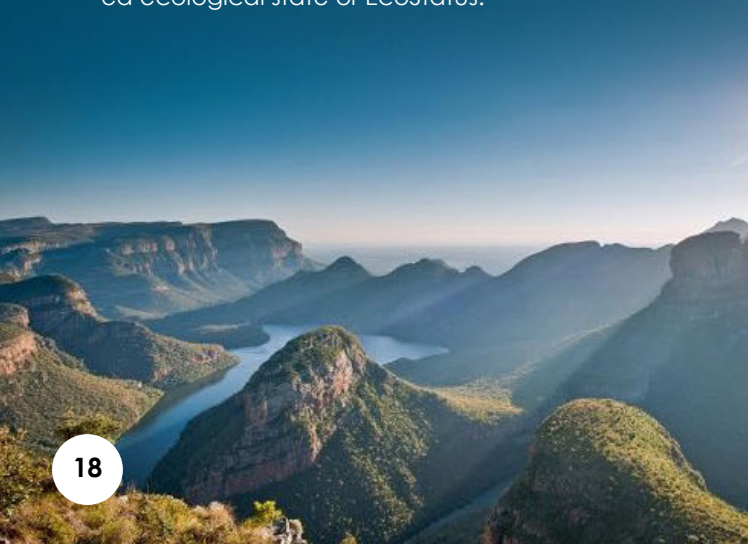
ECOSTATUS OF THE SABIE-SAND RIVER CATCHMENT

Francois Roux and Marcus Selepe

Aquatic ecosystems all over the world are severely stressed by the ever-increasing demand for water, linked to growing industrial and agricultural developments as well as large-scale urbanization. This situation is exacerbated in South Africa by our dry climatic conditions, resulting in most of our rivers being small non-perennial with erratic flow. Although aquatic ecosystems are frequently subjected to extreme events such as floods and droughts can recover, which suggests that rivers can be used without causing permanent damage or change to its physical and chemical properties. However, a water resource is an aquatic ecosystem that comprises the physical aquatic habitat with its biota (both instream and riparian), linked to its physical, chemical and ecological processes. An understanding of its natural structure and function and its responses to development and exploitation are therefore essential to conserve it in a state where it can maintain its natural biodiversity.

What is EcoStatus?

EcoStatus or Ecological Status refers to an integrated ecological category for rivers. In other words, the ecological category derived for each of the biological response components for a particular river is used to derive an overall, integrated ecological state or EcoStatus.



What is the objective of this study?

The objective of this study is to determine the current Ecostatus (2016) of the Sabie-Sand River and some of its main tributaries based on the rapid assessment of aquatic macro-invertebrates using the South African Scoring System version 5 (SASS5) with the Macro-invertebrate Response Assessment Index (MIRAI) (Thirion, 2008), the Fish Response Assessment Index (FRAI) (Kleynhans, 2008), Riparian Vegetation Response Assessment Index (VEGRAI) (Kleynhans et al., 2007) and the integration of these Ecostatus indices to provide an integrated Ecostatus per SQR (Kleynhans & Louw, 2008). This study will provide useful ecological information through an aquatic assessment, the determination of the Present Ecological Status of the associated aquatic habitat of the Sabie-Sand River and trends in aquatic health over time, as well as a comparison with previous surveys (2011) to inform on management interventions required to address systemic and point specific impacts. Monitoring is only a valid term to use if the results of this survey is measured against targets (Greenwood & Robinson, 2006). The results of this survey should therefore be compared to the Target Ecostatus Categories (TEC) as Gazetted and documented for the Resource Quality Objectives (RQO's) defined for each prioritised resource unit (RU) within every Integrated Unit of Analysis (IUA) in terms of water quantity and quality, as well as habitat and biota (Government Gazette No 40531, 30 December 2016; DWA, 2014b)).

What to know

The Sabie-Sand River system forms part of the Inkomati system which cover 709 600 ha rising at 2130 m.a.s.l on the eastern Escarpment and reaches the Mozambican border at an altitude of 120 m.a.s.l., 175 km from its source. At the Mozambican border the Sabie River enters the Corumano Dam, a very large dam on the eastern boundary of the KNP. The catchment is underlied by Basement Complex traversing the lower Middleveld and upper Lowveld portions of the basin (Drakensberg range to the Limpopo Mountains), Karoo sequence in the eastern section of the Lowveld, and the Transvaal Sequence which lies on the mountainous western extremes of the basin, separated from the Basement Complex by a Dolomite intrusion. The mean annual precipitation falls from 2000 mm per year (Graskop) to about 600 mm per year (Lowveld). The river flows through more than 74 000 ha of commercial forestry plantations (pine trees and eucalyptus). Further downstream it provides the main water supply for the southern part of the KNP where water uses are primarily for potable supply to the tourist industry associated with the Park, as well as water for conservation purposes.

Sabie River Mainstem

The Sabie River originates at an elevation 2,207 m.a.s.l., flowing for 235 km in a Easterly direction towards its confluence with the Inkomati River in Mozambique, at an elevation of 59 m.a.s.l. The upper reaches are steep mountain streams characterised by cascades and waterfalls. There are five known waterfalls on the main Sabie River channel, all located upstream from the Sabie-Mac Mac confluence. The Sabie River catchment originates in the Northern Escarpment Mountains aquatic ecoregion, and then flows through three additional aquatic ecoregions before entering Mozambique. The North Eastern Highlands, Lowveld and Lebombo Mountains make up the other aquatic ecoregions. The upper reaches are dominated with commercial forestry, saw-mills, trout farms and fishing areas, Sabie town area, and to a smaller extent industrial and agricultural activities. Lower down agricultural crops, towns (e.g. Hazyview) and rural settlement areas dominate. The Sabie River enters the Kruger National Park 81.3 km downstream from its source.

2018 NATIONAL WATER WEEK

The National Water Week was held throughout the month of March from the 2nd to the 23rd. It was launched at the Spark Festival with both Arts & Culture, and the Annual Science Schools competition initiated by the IUCMA and partners. It should be noted that the Sciences schools competitions took a different turn this year with 6 regional (sub-catchment based) competitions building up to the finals. As compared to previous years, more schools were exposed to the concept, where learners displayed and presented their water treatment models in the bid to win the coveted prize. In the regional competitions, participation was as follows:

- **Crocodile 10 Schools (50 learners)**
- **Lower Komati 15 schools (75 learners)**
- **Sabie 8 schools (40 learners)**
- **Sand 7 schools (35 learners)**
- **Upper Komati 5 schools (25 learners)**
- **Usuthu 6 schools (30 learners)**

In total the number of schools was 51 and 225 learners were given exposure to the concept. This is an improvement from an average of 22 schools from previous years. All the 3 winning schools from each sub-catchment were given equal opportunity to take part in the final competitions which took place on the 23rd of March at the River Side Mall.

Position 1 went to Khaliphani Secondary Schools from the Crocodile (R5000 and a Tablet loaded with e-learning guides for each learner, 5 learners per team). This school has been in the competition for the past 5 years. It should be noted that a new team represents a school each year to give maximum exposure to learners. Position 2 went to Rev SA Nkosi Senior Secondary School from Usuthu sub-catchment (R3500 and a Tablet loaded with e-learning guides for each learner). This school was participating for the first time. The 3rd position went to Sisukumile Secondary School from Upper Komati (R2000 and a Tablet loaded with e-learning guides for each learner). This was their first victory in 3 years.

The Department of Water and Sanitation supported the competitions and the other participating partners were Sappi (Sponsors of Cash Vouchers, tables and chairs), SembCorp Silulumanzi (Sponsors of Trophies, Schools Bags, water tank and mini lab), Rand Water (Sponsors of Tablets with e-learning guides), KOBWA (Sponsors of T-shirts for learners and Scientific calculators), Metal Manganese Company (MMC) (Sponsors of Scientific calculators), City of Mbombela Local Municipality (Sponsors of refreshments for VIPs). Other partners who formed part of the local organising committees were EDM, ZMG, Dormehl Technology, Working on fire and SANBI. Local municipalities largely supported regional competitions.

Working together proves that a lot can be achieved in bettering the life's of the learners and investing in communities.

water & sanitation
Department:
Water and Sanitation
REPUBLIC OF SOUTH AFRICA

sappi
Inspired by life

YWP
YOUNG WATER PROFESSIONALS

sembcorp
silulumanzi

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EHLANZENI
DISTRICT MUNICIPALITY

RAND WATER

education
MPUMALANGA PROVINCE
REPUBLIC OF SOUTH AFRICA

SANBI
Biodiversity for Life
South African National Biodiversity Institute

WORKING ON FIRE

KOBWA
WATER FOR EVER

BARBERTON MINES
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CITY OF MBOMBELA
THE ULTIMATE DESTINATION

ZMG-WATECH
ZAMANGWANE WATER TECHNOLOGY

MANGANESE METAL COMPANY

DORMEHL TECHNOLOGY cc
DESIGN CIVIL WATER AND SEWAGE SYSTEMS

REPORT WATER POLLUTION *INCIDENTS*

The IUCMA is aware that pollution incidents occur occasinally in the the catchment. Therefore, for any water pollution incidents like sewage leakages and others, please report at **water@iucma.co.za**

OR CALL US AT
013 753 9000

OR ALTERNATIVELY DROP US A MESSAGE ON THE "CONTACT US" BUTTON ON THE WEBSITE.
www@iucma.co.za

You can also report to the Catchment Management Forum in your area.

Water saving tips

Kettles should
not be filled
to the brim but with just enough water for your needs. This will reduce your electricity bill too.

Taking a bath can use between
80 and 150
litres of water per bath.

Do not overfill
containers like pots, as this may result in using more energy to heat the water.

Fix a **leaking toilet** otherwise it can waste up to
100 000 litres
of water in one year.

IUCMA & REMCO at the 14th International Water Association Specialist Conference on Watershed and River Basin Management, Skukuza Camp Kruger National Park

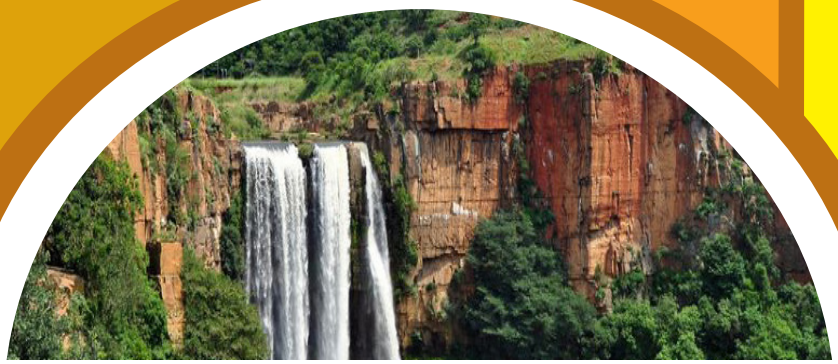
Managing the transboundary water resources in an adaptive and climate change resilient manner

The South African, Swaziland and Mozambique water resource management authorities (Inkomati-Usuthu Catchment Management Agency in South Africa, Komati River Basin in Swaziland, Ara Sul in Mozambique) have partnered with the Dutch Water Authorities to share lessons on resource management at a local scale and at a transboundary (international) scale.

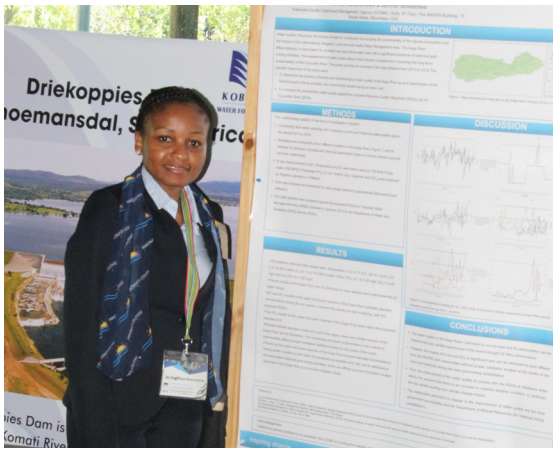
Through this partnership, the use of weather data has become an important input to management of the resources and supporting decision making processes. This has in the last few years enabled the use of electronic data management systems to capture data and display it spatially to inform stakeholders.

The same systems can use models to predict the future/have early warning systems for necessary decision making. It is important to acknowledge the support provided in the management of the drought process.

This workshop, aimed at showcasing the use of Hydronet to visualise water quality and quantity data, draw quarterly reports and to enable the transboundary management of the water resources. The outcome of the workshop is to reinforce the existing partnerships and showcase probable future uses of the systems to benefit water users and decision makers.



INTRODUCTION: *IUCMA's Dr Thomas Gyedu-Ababio engaging with stakeholders during the 14th IWA Conference.*



INITIATIVE: *IUCMA's Ms Rofhiwa Ramunenyiwa presenting her poster at the IWA Conference.*

PARTICIPATION: *IUCMA's Dr Jennifer Molwantwa (left) engages with stakeholders during IWA Conference breakaway sessions.*

ENGAGEMENT: *IUCMA's Mr Marcus Selepe (khaki hat), Mr Sipho Magagula (red T-shirt), and Mr Adolf Mbetse (traditional T-shirt) engaging stakeholders during the IWA Conference Tour at Inyaka Dam.*

LEARNER'S CORNER

KNOW MORE ABOUT GROUND WATER

What is groundwater and why is it important?

The excess soil moisture that saturates subsurface soil or rock and migrates downward under the influence of gravity. In the literal sense, all water below the ground surface is groundwater: In hydrogeologic terms, however, the top of this saturated zone is called the water table, and the water below the water table is called groundwater. (source: Encyclopedic Dictionary of Hydrogeology; 2009).

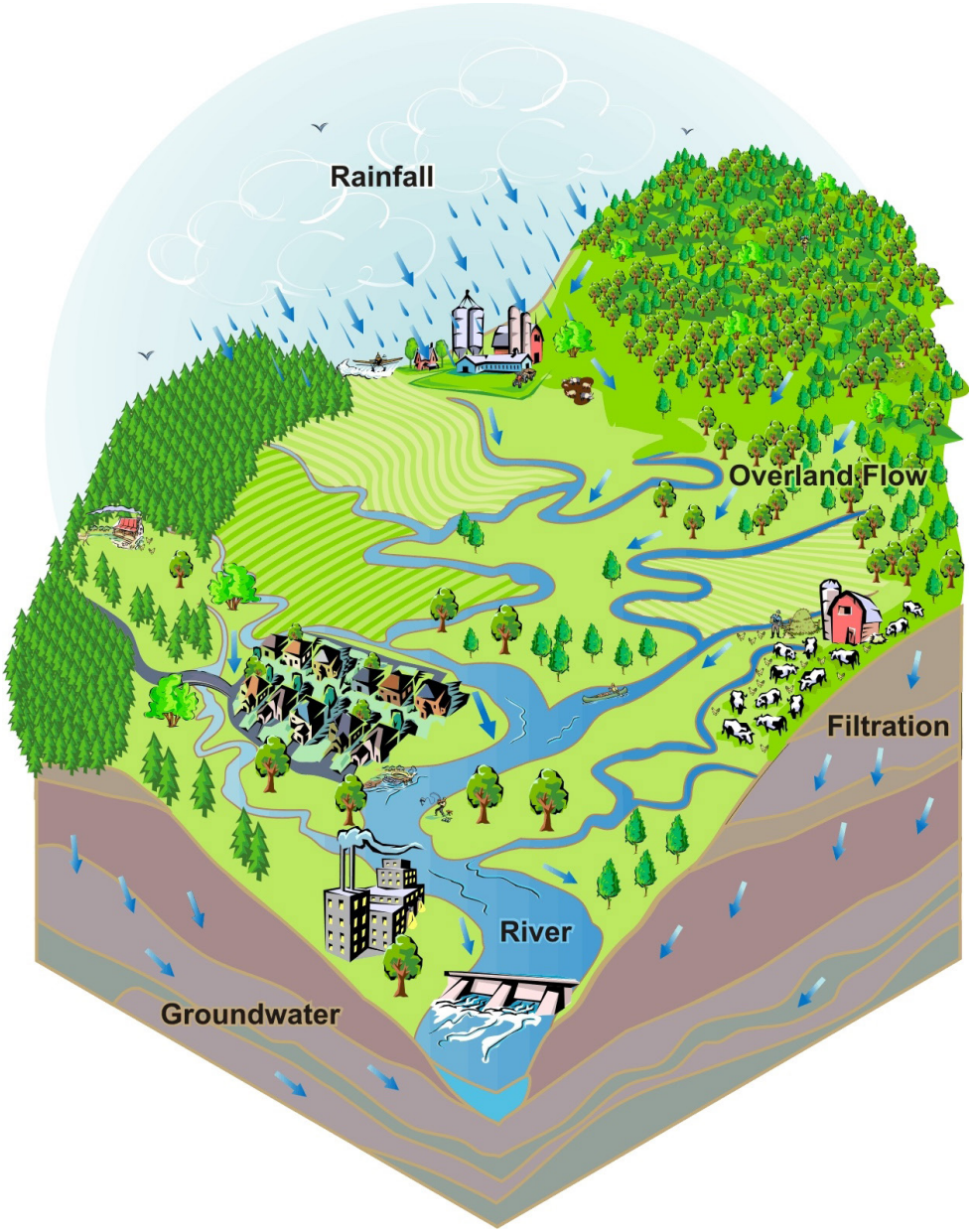
Groundwater has many benefits to human beings. It is usually cheap to develop because it's generally of a good quality and widespread occurrence. Being stored underground where evaporation is minimized, it is a more reliable source than surface water in times of drought.

Where does groundwater come from?

Groundwater is an important part of the water cycle. It comes from rain, snow, sleet and hail that soak into the ground. The water moves down into the ground because of gravity, passing between particles of soil, sand, gravel, or rock, until it reaches a depth where the ground is filled, or saturated, with water. The area that is filled with water is called the saturation zone and the top of this zone is called the water table. The water table may be very near the ground's surface or it may be hundreds of meters below.

Although groundwater exists everywhere underground, some parts of the saturated zone contain more water than others. An aquifer is an underground formation of permeable rock or loose material which can produce useful quantities of water when tapped by a well. These aquifers may be small, only a few hectares in area, or very large, underlying thousands of square kilometers of the earth's surface.

Even if groundwater is not used by people, it may still play an important role in the local environment and sustain rural livelihoods that way. Plants may tap into it with their roots and animals may drink it when it comes to the surface as springs.



If groundwater is underground, how do we get it out?

Under natural conditions water in aquifers is brought to the surface through a spring or can be discharged into streams or wetlands. Water in aquifers is brought to the surface naturally by means of a spring, a borehole or can be discharged into lakes, streams or the ocean. We as humans can abstract groundwater through a borehole which is drilled into the aquifer.

Once a successful borehole has been drilled, we can equip it with any of the following equipment: (the choice is influenced by the specific intended use of the water, e.g. for drinking water, water supply to municipality, irrigation and other):

handpump – especially if yield of borehole is low, mainly in rural areas,

windpump – mainly on farms, can maintain higher yields,

electrical pump/diesel pump – usually when borehole yield is higher, higher assurance supply, or

Continues on page 28 & 29

Boreholes require sophisticated technology with the right appropriate technical design, together with proper knowledge of the aquifer. Unfortunately, the importance of good quality borehole design and construction is often underestimated. The lifetime of a borehole and the efficiency of its functioning depend directly on the materials and the technology used. Borehole "failure" is often not linked to aquifer performance, but to the incorrect design and construction of the hole.

Groundwater in South Africa

Groundwater, despite its relatively small contribution to the total water supply in South Africa (~13%), represents an important strategic water resource. Owing to the lack of perennial streams in the semi-desert to desert parts, two-thirds of South Africa's surface area is largely dependant on groundwater. In these water-scares areas, groundwater is more valuable than gold. Although irrigation is the largest user of groundwater, groundwater provides the water supply to more than 300 towns and smaller settlements.

In over about 90% of the surface of South Africa, groundwater occurs in hard rock that is rocks with no pore spaces. Here it is contained in faults, fractures and joints and in dolomite and limestone, in dissolved openings called fissures.

Hard rock aquifers are known as secondary aquifers because the groundwater occurs in openings which were formed after the rock was formed. Over the remainder of the country groundwater occurs in primary aquifers. These comprise porous sediments and soils where groundwater is contained in the spaces between sand grains. Primary aquifers are found in river (alluvial) sediments, in coastal sand deposits, and the Kalahari deposits.

Groundwater Quality

One of the most important natural changes in groundwater chemistry occurs in the soil. Soils contain high concentrations of carbon dioxide which dissolves in the groundwater, creating a weak acid capable of dissolving many silicate minerals. In its passage from recharge to discharge area, groundwater may dissolve substances it encounters or it may deposit some of its constituents along the way. The eventual quality of the groundwater depends on temperature and pressure conditions, on the kinds of rock and soil formations through which the groundwater flows, and possibly on the residence time.

As a result the groundwater chemistry from various places in South Africa will differ depending on the aquifer in which it is found and may make the water unsuitable for certain uses. For example, water from the Malmesbury shales is unsuitable for most uses due to high total dissolved salts. Groundwater in granites (eg. in Limpopo) naturally contains fluoride in high concentrations.

It is essential to have the quality of the water from a borehole intended for domestic use tested before consumption. Even natural groundwater may contain substances which can make it unfit for consumption.

Groundwater Pollution

Just because water is underground does not mean that it cannot be polluted. Groundwater can be contaminated in many ways. Groundwater associated with coal deposits often contains dissolved minerals poisonous to plants and animals. Pollutants dumped in the ground, in landfills and at sites of animal husbandry or pollutants introduced below ground such as in unlined latrines and burial sites, may leak into the soil and work their way down into aquifers.

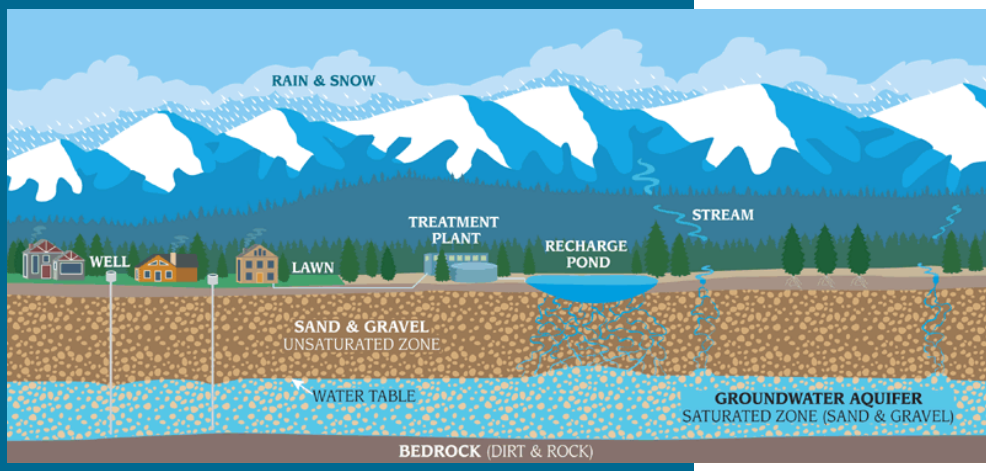
Pollutants include substances that occur as liquids like petroleum products, dissolved in water like nitrates or are small enough to pass through the pores in soil like bacteria. Movement of water within the aquifer is then likely to spread these pollutants over a wide area, making the groundwater unusable and spreading disease.

The Danger of Over Abstraction

While groundwater is an abundant resource, it does not mean we should waste it. The maximum quantity of groundwater that can be developed economically in South Africa is estimated at about 6 billion/m³ a year. Some groundwater resources take a long time to replenish. If too much groundwater is extracted too fast, it may become depleted. In coastal areas, fresh water, being less dense, floats on salt water. Over extraction of fresh water may allow salt water to replace it. Therefore, it is important to decide how much water can be extracted from an aquifer before it is developed.

Can we run out of groundwater?

Groundwater supplies are recharged naturally by rain and snow melt. That means we are only able to abstract as much water as that being recharged, otherwise the groundwater supply will run into a "deficit". It is therefore possible that we can run out of groundwater, at least until the supply has been recharged again. This recharge process can take months, years or even hundreds of years. It is important to know how much water is available for abstraction from a specific aquifer BEFORE we start to utilise it.



Article by Mr Colani Mokoena from Marketing and Communications

NUFFIC TRAINING 2018

WEATHER SMART – WATER RESOURCE MANAGEMENT

ENGAGEMENT: *(Left to right) AquaDactic's Mr Bert Hendriks concentrates as he engages with IUCMA's Dr Tendai Sawunyama during the Nuffic Training at the Nutting House.*

As the proverb says that "We learn from those who have achieved what we wish to achieve". This was testimonial for the Inkomati Usuthu during the third week of April 2018 (16-20 April) wherein IUCMA Staff members were afforded the opportunity to attend a Weather Smart – Water Resources Management specialized training conducted by AquaDactics and the World Water Academy from the Netherlands. The training was part of the continuous professional development among members of staff within the IUCMA. This specialised training was also attended by IUCMA interns as part of their induction in Water Resource Management. Although the basic entry requirements to this course is a University Degree in Hydrological Sciences, for the benefit of the organization Other disciplines such as Institutions & Participation, Marketing & Communications, etc. were accommodated as well.

The main objectives of this training among others, were to harness basic knowledge of integrated water resource management, in-depth understanding of weather and water management and the use of the HydroNET. This 5-Day long training was split into three modules: Basics of water resources manage-

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AquaDactics

ment, Weather & Water Management and an optional Hands-on Training on HydroNET. The distinguishing feature of this training was the fact that International Experts in WRM i.e Dutch partners from the Netherlands (Aqua-Dactics & World Water Academy), Local partners (South African Weather Services) and Inhouse Experts and Specialists in Hydrological Sciences (IUCMA Specialists) and Divisional Managers together managed to deliver the course. This also included the Board Secretary (Adv. Johan Boshoff) who outlined the Legislation & Legal Frameworks within which the IUCMA operates.

The training also focused on Weather & Water Management focusing on the intergration of weather information in assisting daily operations of the IUCMA and dealt with topics such as climate, weather information and weather models, interpretation of weather forecast, using weather data for water quantity, how to make weather smart decisions and communicating such decisions to stakeholders.

The course concluded with an optional hands-on training on Hydronet. This was more targeted on staff members who are not familiar with the system. Members of staff demonstrated enthusiasm and participation throughout the training duration as it also encompassed group activities in which trainees worked together in practically demonstrating what they have learnt. (Cloud formation and types, Soil saturation etc). There was also a training of Trainers who will continue assisting others in the long run.

This course also demonstrated the intergration of water quality and water quantity. This emphasized the relationship and interdependence between water quality and water quantity. The training closed with a certification Ceremony wherein all delegates were insured with attendance Certificates. This Ceremony was graced by the CEO, Dr Thomas Gyedu-Ababio and other members of the Management Team graced the event.

A LIGTHER MOMENT: *(First row from left to right) AquaDactic's Ms Ingrid Hilwerda, IUCMA's Ms Nokulunga Zwezwe, AquaDactic's Ms Lee-Ann Simpson, IUCMA's Mr Andile Nkosi, Mr Joseph Mabunda, Mr Fairbridge Mnisi and Dr Tendai Sawunyama. (Second row from left to right) Hydronet's Ms Helga Vuist, IUCMA's Mr Mfundo Dlamini, Mr Sipho Magagula, Mr Andrew Mbhalati, Mr Marcus Selepe, AquaDactic's Ms Agnes Maenhout and IUCMA's Mr Sakhile Nkosi. (Third row from left to right) IUCMA's Ms Manty Mashaba, Mr Thokozane Malibe, Mr Colani Mokoena, Ms Mapule Sequmela, Ms Bongekile Mavuso, Mr Xolani Myanga and Ms Ayanda Mdhluli. (Fourth row from left to right) IUCMA's Ms Rofhiwa Ramunenyiwa, Ms Thandi Dhzangi, Ms Tebatso Chiloane, Ms Philasande Mahlako, Ms Zintle Mbeka at the Nuffic Training.*

For more pictures view page 32 & 33

CONCENTRATION: *IUCMA's Ms Thandi Dzhangi (left), Ms Zintle Mbeka (middle left) and Ms Ayanda Mdhluli (right) concentrate as they do a group project with Mr Xolani Myanga (middle) during the Nuffic Training at the Nutting House.*

ACHIEVEMENT: *(Left to right) AquaDactic's Ms Agnes Maenhout hands over the Nuffic Training Certificate to IUCMA's Mr Fairbridge Mnisi alongside Dr Thomas Gyedu-Ababio and Mr Sipho Magagula as they share a lighter moment during the Nuffic Training.*

ENGAGEMENT: *Hydronet's Ms Helga Vuist shares the information about Rain and Evapotranspiration during her presentation at the Nuffic Training.*

INFORMATION SHARING: *IUCMA's Ms Manty Mashaba representing her group as she makes a presentation during the Nuffic Training.*

COLLECTIVE EFFORT: *(Left to right) IUCMA's Ms Nokulunga Zwezwe, Ms Ayanda Mdhluli, Ms Tebatso Chiloane and Mr Sakhile Nkosi work together on a group project during the Nuffic Training.*

TEAM WORK: *(Left to right) IUCMA's Mr Andile Nkosi, Ms Zintle Mbeka, Mr Thokozane Malibe and Mr Xolane Myanga work together on a group project during the Nuffic Training.*

CAREER GUIDANCE

FOR LEARNERS IN WATER RESOURCE MANAGEMENT

Career options and study opportunities in the form of financial assistance are offered by IUCMA. Since the IUCMA is a science focused institution, subject choices during high school should include science, geographical sciences, biological sciences and mathematics.

The breakdown of career choices offered by the IUCMA is indicated below:

1. Water Resource Specialist/Managers
Academic qualifications:

1.1. Bachelor of Science degree in (Aquaculture; Biology; Chemistry; Chemical Engineering; Biochemistry; Microbiology, Limnology; Zoology; Botany; Civil Engineering)

1.2. Bachelor of Science in Environmental Sciences (Geography; Geographical Information System; Geology)

1.3. Bachelor of Technology Water Care

1.4. Bachelor of Technology Analytical Chemistry

2. Hydrologist
Academic qualification:

2.1. Bachelor of Science (Hydrology; Hydrological Modelling; Water Quality Modelling)

3. Aquatic scientist
Academic qualification:

3.1. Bachelor of Science (River Health; Aquaculture; Bio-monitoring; Water and Waste Water; Water Quality Management; Zoology; botany; Limnology)

4. Water Resources Planners
Academic qualification:

4.1. Bachelor of Science/Engineering (Water Engineering; Chemical; Waste Water Treatment; Water Resources Modelling)

5. Water Resources Compliance Monitoring and Enforcement Officers
Academic qualifications:

5.1. Bachelor of Science degree in (Biology; Chemistry; Chemical Engineering; Biochemistry; Microbiology, Environmental Law; Hydrology; Geohydrology; Civil Engineering

5.2. Bachelor of Science in Environmental Sciences in (Geography; Environmental Law, Geographical Information System)

5.3. Law degree (Environmental Law)

6. Geohydrologist
Academic qualifications:

6.1. Bachelor of Science (Hydro-geology; Hydrology)

6.2. Bachelor of Technology (Geo-hydrology; Hydrology; Water Resources Modelling; Water Quality Management)

7. Stakeholder Management
Academic Qualifications:

7.1. Bachelor of Arts (Developmental Studies; Public Administration; Public Management; Social Studies)

7.2. Bachelor of Technology (Developmental Studies; Public Administration; Public Management)

VISION:

"WATER FOR ALL IN INKOMATI-USUTHU"

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EcoStatus definition

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Water irrigation

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Learner's corner

http://www.gwd.org.za/content/groundwater-resource-more-valuable-gold

SLOGAN:

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