

WATER NEWS

2020/21 2ND EDITION



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**SAVE
WATER
SAVE LIFE**

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MANAGEMENT AREA MAP** PAGE 7



INKOMATI-USUTHU
CATCHMENT MANAGEMENT AGENCY

VISION

Sufficient, equitable and quality water resources for all in the Inkomati-Usuthu Water Management Area

MISSION

To efficiently manage water resources by empowering our stakeholders in our quest to contribute towards transformation by promoting equal access to water and protecting the environment

VALUES

Integrity
Batho Pele (Stakeholders Orientation)
Accountability
Diversity
Transparency

SLOGAN:

“INKOMATI-USUTHU CMA, YOUR PARTNER IN WATER MANAGEMENT”



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FOREWORD BY THE CEO



Dear Stakeholders

Welcome to our first newsletter for 2021. Let me start by congratulating you for demonstrating your commitment to us in helping to combat the challenges brought about by the Covid-19 virus. With your cooperation we were able to give effect to our mandate, i. e. to distribute water equitably to our water users despite being highly constrained because of the long-term effects of the drought, and the challenges experienced because of the Covid-19 virus. Unfortunately, the drought has hampered our ability to honour our international obligations with Swaziland and Mozambique.

As the first CMA, IUCMA prides itself on the following achievements: the compilation of the CMS; reduction of pollution in the water management area; empowering stakeholders especially historically disadvantaged individuals (HDIs) to understand issues of water resources; management and legislation; verification and validation of water uses and water use authorisations. In addition, we have assisted schools by providing water as part of our Corporate Social Investment. We acknowledge your sterling support in achieving these goals and we are confident when we say that together we can achieve greater heights.

The hydrological status of dams in the Inkomati-Usuthu Water Management area was determined subsequent to the heavy rains which followed tropical cyclone Eloise. It shows that all dams have increased their capacity and some have even reached full capacity. However, we would humbly request that our users and stakeholders remain vigilant and mindful in their interactions with our precious resource and continue to use water economically.

In terms of section 92(1) of the NWA, the Minister of Human Settlements, Water & Sanitation has initiated the process of establishing water user associations (WUAs) in the Inkomati-Usuthu Water Management Area. As the delegated authority in this regard, the IUCMA would be assisting with this process. In order to reach a successful outcome, the IUCMA is inviting all interested and affected parties to share their valued inputs. It is envisioned that the Minister of Human Settlements, Water & Sanitation would proclaim and gazette the established UWAs by the end of the financial year (31 March 2021).

It is rather distressing that South Africa's quality of water is decreasing as demonstrated by a recent analysis of long-term trends in the water quality of rivers in the Olifants-Limpopo and Inkomati catchments. Amongst others, the following treats and challenges have been identified: sewage effluents, habitat alteration, acid mine drainage, invasive species. We are appealing to all our water users to be heedful in their engagement with our water resources. We should strive to leave a legacy for future generations – that of safe and clean water.

As per our monitoring commitment, we have conducted and concluded a survey to determine the ecostatus of the Usuthu-Lusutfu Catchment in 2019. This report can be found on our website.

In conclusion, I would once again like to emphasise that the IUCMA values their stakeholders and is looking forward to another year of renewed collaboration in its objective to provide the basic human right of access to safe and clean water to all our citizens.

Adv. Bernard Shabangu (aCEO)



Editor's NOTE

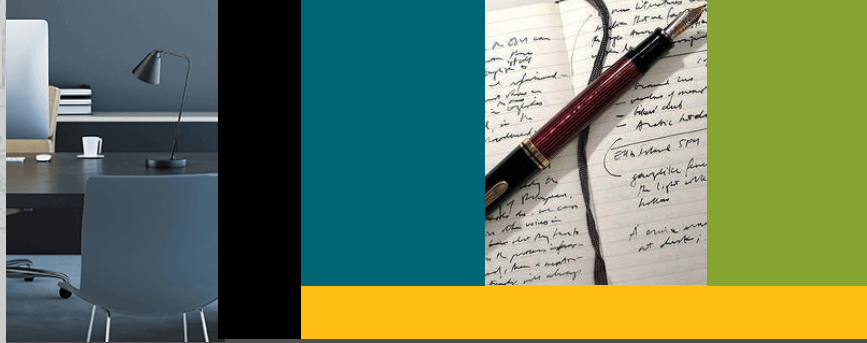


This newsletter is the first for 2021. Despite challenges experienced under Covid-19, the IUCMA and its stakeholders have managed to keep its head above water, so to speak. These challenges have seen us going back to the basics. We would not have been able to achieve our milestones if you had not provided your unwavering support. We salute you.

In terms of the National Water Act, 1998, the IUCMA is mandated to establish water user associations in the Inkomati-Usuthu Water Management Area. The IUCMA appeals to all relevant stakeholders to provide inputs in this regard. (Please see Page 12)

The main objective of the IUCMA is to work with water services to ensure that resources given to people are protected, clean and safe. It also ensures the equitable distribution of this highly valued resource. Drought has continued to impact on our activities. But despite this, we have achieved much. You can read more about our achievements on Page 30.

Recent analysis of long-term trends in the water quality of the Olifants-Limpopo and Inkomati catchments indicated to poor quality water overall. Research has also shown that the quality of water in South Africa is worsening. Reasons for this happening can be found on Page 14 through 17. Globally, countries have



introduced instream biomonitoring to supplement water resource management. Read more about the biomonitoring study which was conducted in the Usuthu-Lusuthu catchment between August and October 2019 to determine the ecological state of this river. (Page 14 through 17)

Dam levels have increased significantly as a result of heavy rains experienced following tropical cyclone Eloise. On Page 8 through 9 you will find the dam level status within the Inkomati-Usuthu WMA as at 15 March 2021. However, the water resources status has been classified as normal and water users are urged to continue their conservation initiatives.

Environmental Management Inspectors (EMIs) or "Blue Scorpions" represent a network of environmental management and enforcement officials across all spheres of government. A comprehensive and detailed description of their duties and scope of work can be found on Page 18 through 21. Further clarification with regard to offences and penalties and what to do if an individual is deemed to have contravened section 151 of the National Water Act can be found under *Frequently asked questions* on Page 21.

On Page 22 of this newsletter our learners can acquire more information about aquatic life – its importance and its role in the ecosystem. On Page 24 the spotlight falls on Irrigation – its advantages and the environmental impact thereof. Information about the 17 most common water-borne diseases can be found on Page 23 through 24. Lastly, learners will come to understand the role of civil engineering in relation to water resource management (See Page 32 through 33).

Covid-19 has reminded us that we have to work together to save our precious resource. The IUCMA is appealing to all its stakeholders and water users to continue conserving our resources while simultaneously heeding the safety protocols around Covid-19. We are invincible together.

Sylvia Machimana



**QR CODE FOR THE
IUCMA WEBSITE**

INKOMATI-USUTHU WATER MANAGEMENT AREA



Legend

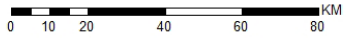
Inkomati Usuthu WMA

Catchment

- Sabie/Sand
- Crocodile
- Komati
- Usuthu

Rivers_Order

- 1
- 2
- 3
- Towns
- Local_Municipality
- International_borders
- Kruger_National_Park



HYDROLOGICAL STATUS OF THE INKOMATI-USUTHU WATER MANAGEMENT AREA

Issued: 15 March 2021

An overview of the water resource status issued by the Inkomati-Usuthu Catchment Management Agency (IUCMA) following tropical cyclone Eloise within Inkomati-Usuthu Water Management Area (WMA).

The heavy rainfall received between January and February 2021 brought about by tropical cyclone Eloise has significantly increased the water resource status of the Inkomati-Usuthu WMA. The water resource status of the Inkomati-Usuthu WMA over the last three months has been classified as normal. In some catchments where water users were placed under severe water use restrictions, these restrictions have now been lifted since mid-February 2021. Tropical cyclone Eloise has brought much-needed relief across the Inkomati-Usuthu WMA, all major dams significantly increased their capacity, and some have reached full capacity (Table 1).

Table 1: Dam levels status within the Inkomati-Usuthu WMA as of 15 March 2021

DAM NAME	15 March 2021 - % FSC	STATUS	PURPOSE/TOWNS
Da Gama Dam	100.3%	Significant Increase	Irrigation
Inyaka Dam	85.2%	Significant Increase	Irrigation, Domestic (Bushbuckridge);
Klipkopjes Dam	100.40%	Significant Increase	Irrigation, domestic (White River)
Kwena Dam	95.8%	Significant Increase	Irrigation, Domestic (City of Mbombela; Nkomazi Local Municipality)
Longmere Dam	102.3%	Significant Increase	Irrigation, domestic (White River)
Nooitgedacht Dam	99.9%	Significant Increase	ESKOM

Prinkop Dam	100.6%	Significant Increase	Irrigation, domestic (White River)
Heyshope Dam	85.9%	Significant Increase	ESKOM
Jericho Dam	89.6%	Significant Increase	ESKOM
Morgenstond Dam	85.5%	Significant Increase	ESKOM
Westoe Dam	98.8%	Significant Increase	ESKOM
Vygeboom Dam	100.4%	Significant Increase	ESKOM
Witklip Dam	100.50%	Significant Increase	Irrigation, domestic (White River)
Lomati Dam	75.00%	Significant Increase	Domestic (Barberton)
Driekoppies Dam	100.7%	Significant Increase	Irrigation, domestic (Nkomazi LM)

The heavy rainfall caused flash flooding in and across the WMA, and high river flow levels in all the major rivers in the past two months. However, based on the current storage levels in most of the dams, we classify the water resources status within the WMA as normal this season. We still advise our water users to continue with water demand and conservation initiatives, so that we continue to protect our precious resource.

Issued by the Inkomati-Usuthu CMA-Contact: IUCMA: Resource Planning and Operations Manager: Dr Tendai Sawunyama on 013 753 9000 or sawunyamat@iucma.co.za.

For latest river flow and dam levels visit: <http://riverops.inkomaticma.co.za>

www.dws.gov.za/hydrology



***By Dr Tendai Sawunyama from
Resource Planning and Operations***

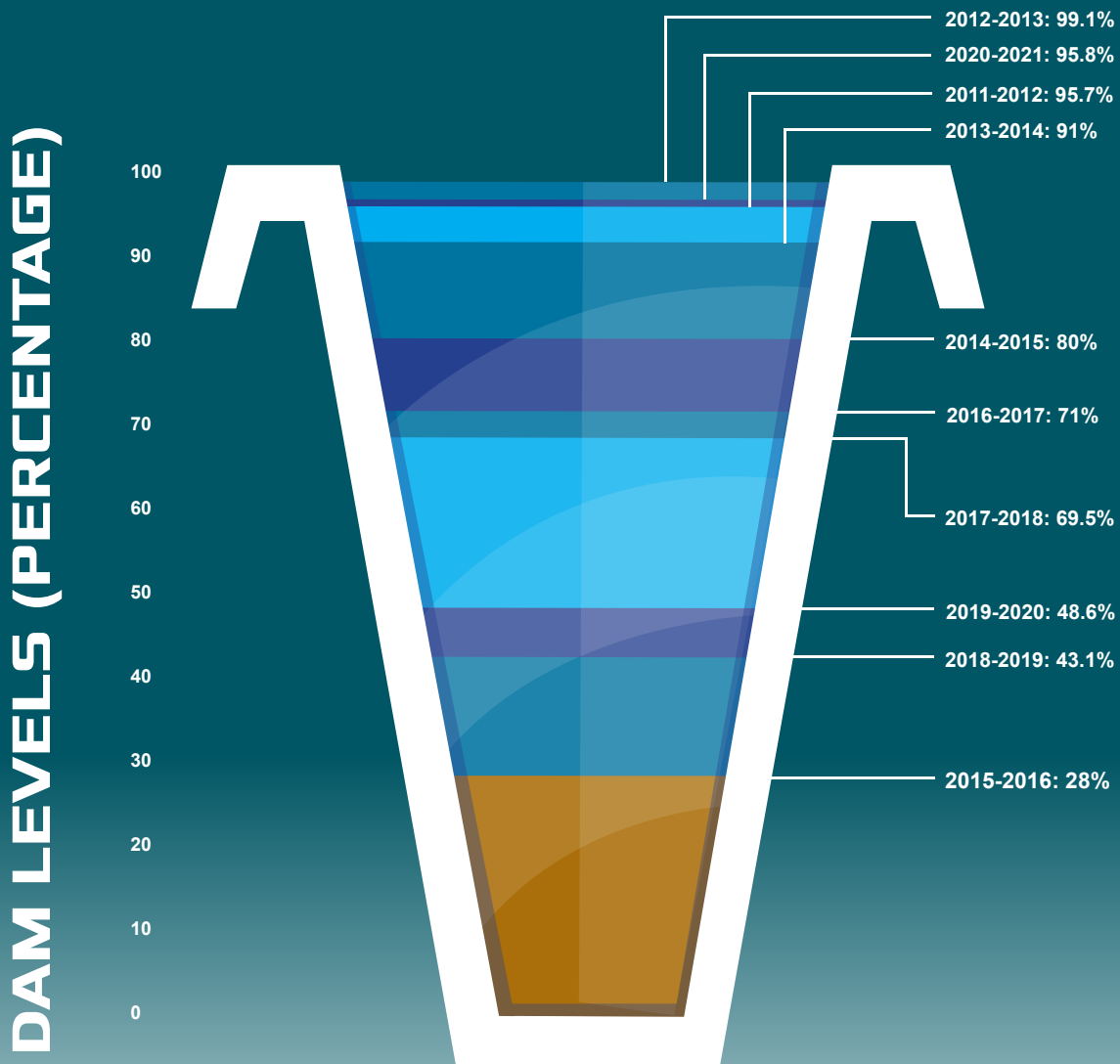


INKOMATI-USUTHU
CATCHMENT MANAGEMENT AGENCY

Imagine this!!!

Kwena dam is the main source of water supply in the Crocodile catchment which runs through Dullstroom to Komatipoort.

The dam almost ran out of the precious resource during the 2015-2016 droughts. The water we have today is not guaranteed for tomorrow. It needs you and I to take care of our water resources.



**TAKE ACTION NOW,
TOMORROW MIGHT BE TOO LATE!!!**

"Inkomati-Usuthu CMA, your partner in water management"
www.iucma.co.za

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 overflow

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.

ESTABLISHMENT OF WATER USER ASSOCIATIONS IN THE INKOMATI-USUTHU WATER MANAGEMENT AREA IN TERMS OF THE NATIONAL WATER ACT, 1998 (ACT NO. 36 OF 1998)

The Minister of the Department of Human Settlements, Water & Sanitation, on her own initiative and in terms of section 92(l), is embarking on the process of establishing water user associations (WUAs) in the Inkomati-Usuthu Water Management Area.

The Inkomati-Usuthu Catchment Management Agency (IUCMA) as a delegated authority and custodian of the water resources at catchment level is facilitating this process of establishing water user associations (WUAs) within its area of jurisdiction.

Authorised water users in the public and private sector, with the inclusion of the irrigation, mining, industrial, tourism and other sectors are to be restructured as Water User Associations. This calls for all existing irrigation boards, subterranean water control boards, water boards established for stock watering purposes, municipalities, farms, hospitals, mines and other industries to be part of this process.

Functions of the WUAs:

- WUAs are member-based local-level institutions intended to support the management of local water resources in the common interest of members.
- Most, but not all WUAs, serve the irrigation and bulk water use community.
- WUAs are area-based and are intended to include all users of a common resource, both consumptive and non-consumptive.

- WUAs can be delegated additional functions to perform on behalf of the DWS or CMAs if it is deemed more effective for them to do so.

The Inkomati-Usuthu Catchment Management Agency is in the process of consulting all affected and interested parties where different scenarios of the projected number of water user associations will be discussed. This includes, amongst others: **the area, towns, economic activities, water requirements, water storage facilities, key challenges and existing irrigation boards** within the designated catchments were considered in developing the scenarios that will be discussed during the consultation process. These factors will assist the stakeholders to collectively decide on the boundaries and number of water user associations. The details of these scenarios will be presented during the consultation meetings and stakeholders' valued inputs will therefore be required for the smooth running of the process.

The Department has also developed a timeframe for the entire process. It is envisaged that the Minister of Human Settlements, Water & Sanitation would proclaim and gazette the established WUAs by the end of the 2020/2021 financial year (31st March 2021).



**By Mr Hasani Makhubele from
Institutions and Participation**



Illegal Dumping
in a watercourse is an
offense and is prohibited




Illegal Damming
in a watercourse is an
offense and is prohibited

***Report any water-related
illegal activities to the***

Inkomati-Usuthu Catchment Management Agency

013 753 9000



Ecostatus of the Usuthu-Lusufu Catchment, Inkomati River System Phase II (2019/20)

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 urbanisation. This situation is exacerbated in South Africa by our dry climatic conditions, resulting in most of our rivers being small non-perennial rivers with erratic flow. Although aquatic ecosystems are frequently subjected to extreme events such as floods or droughts they can recover, which suggests that rivers can be used without causing permanent damage or change to their 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. A recent analysis of the long-term trends in the water quality of rivers in the Olifants-Limpopo and Inkomati catchments, indicated a general decrease in “water quality at sites in mid to low catchments” (Griffin et al. 2014). Indeed, the quality of South Africa's water resources are deteriorating (CSIR 2010). Some of the main known challenges include the following:

- over abstraction;
- habitat alteration (e.g. sedimentation, bank and bed scouring, flow regulation, and more);
- eutrophication;
- acid mine drainage;
- sewage effluents;
- anthropogenic salinization;
- toxic organic compounds, and
- invasive species (fauna and flora).

(Dallas & Day 2004; Davies et al. 1993; Davies & Day 1998; Griffin et al., 2014):


Although water quality state at present appears to be good across the Upper Usuthu (DWS, 2014d), with the Usuthu River being approximately in balance (DWA, 2013), the extent of current and future mining activities poses a threat to water quality. According to the South African Mine Water Atlas (2018) the *Mineral Risk*, the assessed risk of acid production and/or leaching of constituents of concern into the environment, is high for a number of quaternary catchments in the study area.

A worldwide trend since the 1980s has been the introduction of instream biomonitoring as part of water resource management. This type of monitoring commonly referred to as biomonitoring is increasingly being recognised as an important component in the overall assessment of water resources. The use of biological field assessments of fish and/or macro-invertebrate communities provides an integrated and sensitive measurement of environmental problems and represents progress in the assessment of ecological impacts and in the management of aquatic ecosystems (Karr et al., 1986).

A national bio-monitoring programme for South African Rivers, the River Health Programme (RHP) was implemented and launched in September 1996 to monitor and thus improve and manage the health of South African freshwater ecosystems. The RHP has been established to provide water managers with relevant information to manage the resource. The RHP focuses on selected ecological indicators that are representative of the larger ecosystem and are practical to measure (http://www.dwa.gov.za/iwqs/rhp/rhp_background.aspx). In 2016, the RHP programme was replaced with the River Ecosystem Monitoring Programme (REMP) as captured in the Department of Water and Sanitation Business Plan and also stipulated as a function of the Catchment Management Agencies (CMAs) (<http://www.dwa.gov.za/iwqs/>).

The Inkomati – Usuthu Catchment Management Agency (IUCMA) appointed the Mpumalanga Tourism and Parks Agency (MTPA – Scientific Services: Aquatic Systems) as a service provider to conduct follow-up biomonitoring surveys (first surveys in 2015, IUCMA Report January 2016 - IUCMA, 2016) within the Usuthu-Lusutfu River catchment in the 2019/2020 financial year to determine the present ecological state of this river system.

Information continues on page 16 and 17



Biomonitoring in the Usuthu-Lusutfu catchment was conducted between August to October 2019. During this survey, forty one (41) sites were sampled in the Usuthu-Lusutfu River and its tributaries, including Assegai-Mkhondvo, Hlelo, Ngwempisi, Mpuluzi and Lushushwane, as well as the tributaries in the sub-catchment. Previously monitored sites (2010/2015) were used as far as possible to be able to make use of existing data for comparison. Standard river biomonitoring techniques were used and data collected were analysed using the models and methods listed below:

- Fish Response Assessment Index (FRAI)
- Macro-Invertebrate Response Assessment Index (MIRAI)
- Riparian Vegetation Response Assessment Index (VEGRAI)
- Index of Habitat Integrity (IHI) models

Available water quality data for the sites identified by the IUCMA, i.e. the *Ecological Water Requirement (EWR) site* on the Assegai River, EWR AS1, and sites where international water quality obligations need to be met, according to the agreement signed by the Tripartite Permanent Technical Committee (TPTC) of South Africa, Mozambique and Swaziland (TPTC, 2002). Data were analysed using standard methods, i.e. the Physico-chemical driver Assessment Index (PAI) model, and present state and compliance with monitoring objectives assessed.

(DWAF 2008; Kleynhans, 2008; Thirion, 2008; Kleynhans et al., 2009)

What is the objective of the study?

The objective of this study is to determine the current Ecostatus (2019) of the Usuthu-Lusutfu Catchment 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), Index for Habitat Integrity

(Kleynhans et al., 2009), the Physico-chemical driver Assessment Index (PAI) model (DWAF 2008), and the integration of these indices to provide an integrated ecostatus per sub-quaternary reach (SQR) (Kleynhans & Louw, 2008). This study will provide useful ecological information through an aquatic assessment, the determination of the present ecological state (PES) of the associated aquatic habitat of the Usuthu-Lusutfu River and trends in aquatic health over time, as well as a comparison with previous surveys (2015) 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 are measured against targets (Greenwood & Robinson, 2006.)

The Preliminary Reserve study for this system provides background information, ecological objectives and monitoring targets. The Chief Directorate: Resource Directed Measures (CD: RDM; now CD: Water Ecosystems) commissioned the Intermediate Reserve Determination study during 2013 which was undertaken by Tlou Consulting (Pty) Ltd. during the three-year period from 2013 to 2015. Water Resource Classification has not yet been undertaken for the Usuthu-Lusutfu River system.

The results of this 2019 survey should therefore be compared to the EcoSpecs and other monitoring objectives defined for water quantity and quality, and habitat and biota during the Reserve study. These objectives were published in DWS, 2014c.

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.



By (from left to right) Mr Marcus Selepe from IUCMA's Resource Quality and Monitoring & Mr Francois Roux from Mpumalanga Tourism and Parks Agency

Download detailed report available on the IUCMA website: www.iucma.co.za

Environmental Management Inspectors (EMIs) ('Blue Scorpions')

1. Environmental Management Inspectors (EMIs) ("Blue Scorpions")

EMIs represent a network of environmental management and enforcement officials operating across all spheres of government. These officials are designated by the Minister in terms of the National Environmental Management Act (Act 107 of 1998) (NEMA). EMIs can be easily identified by their uniform. This uniform has a specific logo or it can be an EMI badge. EMIs are required to monitor, investigate and enforce compliance with the NEMA and the Specific Environmental Management Acts (SEMAs) for which they have been designated.

2. SEMAs are the following Acts:

- National Water Act (Act 36 of 1998)(NWA)
- National Environmental Management: Biodiversity Act (Act 10 of 2004) (NEMBA)
- National Environmental Management: Protected Areas Act (Act 57 of 2004 (NEMPA)
- National Environmental Management: Waste Act (Act 59 of 2008) (NEMWA)
- National Environmental Management: Integrated Coastal Management Act (Act 24 of 2008)
- World Heritage Convention Act (Act 49 of 1999)
- Environmental Conservation Act (Act. 73 of 1998)

National Water Act (Act of 1998) (NWA) Powers and duties of Authorised Persons (Section 125 of NWA):

(1) An authorised person may, at any reasonable time and without prior notice, enter or cross a

property with the necessary persons, vehicle, equipment and material to carry out routine inspections of the use of water under any authorisation. (2) An authorised person may enter a property with the necessary persons, vehicles, equipment and material

(a) After giving reasonable notice to the owner or occupier of the property, which notice must state the purpose of the proposed entry; and

(b) After obtaining the consent of the owner or occupier of that property,

In order to-

(i) Clean, repair, maintain, remove, or demolish any government water work operated by any water management institution.

(ii) Undertake any work necessary for cleaning, clearing, stabilising, and repairing the water resource and protecting the resource quality.

(iii) Establish the suitability of any water resource or site for constructing a water work.

(iv) Undertake any work necessary to comply with an obligation imposed on any person under this Act, where that person has failed to fulfil that obligation.

(v) Erect any structure and to install and operate any equipment on a temporary basis for monitoring and gathering information on water resources; or

(vi) Bring heavy equipment on to a property or occupy a property for any length of time.

(3) An authorised person may, at any reasonable time and without prior notice, on the authority of a warrant, enter a property with the necessary persons, vehicles, equipment and material, and perform any action necessary to-

(a) Investigate whether this Act, any condition attached to authorised water use by or under this Act or any notice or directive is being contravened.

(b) Investigate whether any information supplied in connection with the use of water is accurate; or

(c) Carry out any of the activities referred to in subsection (2) where the consent of the owner or occupier of that property has been withheld.

(4) A warrant referred to in subsection (3) must be issued by a judge or a magistrate who has jurisdiction in the area where the property in question is situated and must only be issued if it appears from information obtained on oath that-

(a) There are reasonable grounds for believing that this Act, any condition attached to any authorised water uses by or under this Act or any notice or directive, is being contravened.

(b) There are reasonable grounds for believing that any information supplied in connection with the use of water is inaccurate; or

(c) It is necessary to carry out an activity mentioned in subsection (2) and access to that property has been denied.

(5) If a warrant is likely to be issued if applied for but the delay involved in obtaining a warrant is likely to defeat the object of an inspection in terms of subsection (3)(a) or (b), an authorised person may enter a property without a warrant.

**Information continues
on page 20 and 21**

(6) An authorised person entering property in terms of this section must, at the request of any person on that property, identify himself or herself and present a certificate of appointment contemplated in section 124 (2).

(7) Notwithstanding any provision of this section an authorized person may not, under any circumstances, enter a dwelling without the consent of the occupier or without a warrant authorising entry.

3. Powers and Responsibilities of EMI's The range of powers given to EMI's to fulfil their mandate includes:

- Conducting routine inspections (entering premises to ascertain compliance, seizing evidence of non-compliance,
- Investigating (questioning witnesses, copying documents, removing articles or substances, taking photographs and video recordings, taking samples),
- Enforcing powers (search and seize establishing roadblocks and arrest) and
- Administrative powers (issuing compliance notices and directives).

4. Offences Relating to EMI's A person is guilty of an offence if that person:

- Hinders or interferes with an EMI's duties or
- Pretends to be an EMI,
- Gives false or misleading information to an EMI and/or
- Fails to comply with a request from an EMI.

ACT AND SECTION	OFFENCES	PENALTY
Section 151 of NWA	Use of water otherwise than as permitted under this Act.	Fine or imprisonment for a period not exceeding five years, or to both a fine and such imprisonment and, in the case of a second or subsequent conviction, to a fine or imprisonment for a period not exceeding ten years or both a fine and such imprisonment.
	Fail to provide access to any books, accounts, documents, or assets when required to do so under the Act.	
	Fail to comply with any condition attached to a permitted water use under this Act.	
	Fail to comply with a directive issued under section 19, 20, 53 or 118.	
	Unlawful and intentionally or negligently tamper or interfere with any water work or any seal or measuring device attached to a water work.	
	Fail to register an existing lawful water use when required by a responsible authority to do so.	
	Intentionally refuse to perform a duty, or obstruct any other person in the exercise of any power or performance of any of that person's duties in terms of this Act.	
	Unlawfully and intentionally or negligently commit any act or omission which pollutes or is likely to pollute a water resource.	
	Fail to register a dam with a safety risk.	
	Fail to comply with a temporary restriction on the use of water in terms of item 6 of Schedule 3.	
Commit contempt of the Water Tribunal.		

7. Frequently asked questions

What are environmental crimes?

Examples:

- Taking water from a water resource without authorisation
- Storing water without authorisation
- Impeding or diverting the flow of water in a watercourse without authorisation
- Engaging in a stream flow reduction activity contemplated in section 36 without authorisation.
- Engaging in a controlled activity identified as such in section 37(1) or declared under section 38(1) without authorisation.
- Discharging waste or water containing waste into a water resource through a pipe, canal, sewer, sea outfall or another conduit.
- Disposing of waste in a manner which may detrimentally impact on a water resource.
- Disposing in any manner of water which contains waste from, or which has been heated in, any industrial or power generation process
- Altering the bed, banks, course, or characteristics of watercourse
- Removing, discharging, or disposing of water found underground if it is necessary for the efficient continuation of an activity or for the safety of people; and

- Using water for recreational purposes

Will my name be disclosed after reporting an environmental crime?

The identity of every person who reports a crime is protected and will not be disclosed to any other party unless you give consent to have your name disclosed to any other party.

Where can I report environmental crimes?

- Inkomati-Usuthu Catchment Management Agency (IUCMA): 013 753 9000 or email: information@iucma.co.za
- Department of Water and Sanitation: 0800 200 200
- Nearest SAPS: 10111

What should I do when I witness an environmental crime?

Gather as much information about the crime and immediately report it as indicated above.

Such information may include:

- Nature of activity
- Photos, if possible
- Registration and make of the vehicle involved in the crime, if any e.g., in case of illegal dumping of wastewater.



**By Mr Andrew Mbhalati
from Compliance Monitoring
and Enforcement**

Know more about **aquatic life.** in dams, rivers and wetlands



The Importance of aquatic life in dams, rivers and wetlands

Freshwater bodies such as dams, wetlands, lakes and rivers are regarded as aquatic ecosystems. They 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 cannot be overemphasised considering that freshwater represents approximately 3% of 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 food security, flood attenuation, water purification, groundwater recharge, nutrients recycling, and habitat provision. And most importantly, provision of water, which is recognised 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 cannot 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 result 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 as *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 add threats to aquatic ecosystems. Wetlands are important natural filters of water and their degradation leads to deteriorating water quality. Other threats include overutilisation of water, overfishing and introduction of invasive species which ultimately disrupts 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 it affects 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 recognised as an emerging threat to aquatic ecosystems with a significant change in temperature expected cause disturbances in pollution and ecosystems in general.



By (from left to right) Mr Marcus Selepe, Dr Mthobisi Soko and Mr Mahlodi Dikgale from Resource Quality and Monitoring

17 Critical and Grievous Diseases Caused by Water Pollution

Water is a necessity in our daily lives. Nonetheless, its access and availability in many parts of the world has been very difficult because of the contamination caused by water pollution. Pollution by chemicals and other toxic substances has contributed to unhygienic conditions of the surface or groundwater systems and as such, people have contracted serious water-borne diseases.

Many people around the world have at one point been victims of the diseases caused by water pollution either after consuming or bathing in polluted water. Some have also suffered after consuming plant or animal food that lives or has been raised by polluted water. Here are **17 critical and grievous diseases caused by water pollution.**

1. Cholera

Cholera is a serious intestinal tract infection caused by bacteria called *vibrio cholerae*. It leads to acute diarrhoea, dehydration, and it can sometimes cause death. An individual gets cholera by washing or consuming contaminated water or eating food washed or irrigated with contaminated water. The symptoms of cholera include vomiting, headache and abdominal cramps. In highly polluted areas, one infected person can contaminate the water with the disease causing bacteria and affect the whole population.

2. Diarrhoea

Diarrhoea is a disease that causes frequent and watery bowel movements. It manifests as a result of intestinal infection or food poisoning by drinking contaminated water with pathogens from animal or human waste. In most cases, it is caused by water-borne bacteria, viruses and protozoans and is one of the common diseases caused by water pollution. Diarrhoea leads to dehydration, loss of electrolytes, and death in infants and young children.

3. Typhoid

Typhoid is a serious bacterial infection distinguished by acute intestinal ulceration and infection. The bacteria responsible for the infection is known as *salmonella*

typhosa. It usually affects one by washing or consuming contaminated water or ingesting food washed with contaminated water. Its symptoms include nausea, loss of appetite and headache and affects approximately 12 million people throughout the world every year.

4. Amoebiasis (Traveller's Diarrhoea)

Just like diarrhoea, Amoebiasis is among the most prevalent diseases caused by water pollution. Also termed as Traveller's Diarrhoea, one suffers the disease by consuming water contaminated with amoeba protozoa. Apart from infecting the large intestine, it can also infect the liver. Amoebiasis symptoms include mild or severe diarrhea with mucus and blood. The likelihood of acquiring amoebiasis are increased as a result of using contaminated water by sewage, poor hygiene, consumption of non-treated water and the presence of flies.

5. Dysentery

Dysentery is an intestinal infection marked by acute diarrhoea with blood and mucus. The disease can also cause vomiting, fever and abdominal pain. It is acquired when one washes with or consumes contaminated water or by eating food washed with contaminated water. It is a bacterial disease and can therefore be prevented by drinking clean water and maintaining good hygiene.

6. Schistosomiasis (Bilharzia)

Schistosomiasis (bilharzia) is caused by parasitic worms that develop in water. Hence, whenever the worms are in a water body, they can penetrate the skin of those washing, swimming or wading in the contaminated water. Once in the body, they can cause infections and damage to the intestines, bladder and the liver. Some types of freshwater snails may also carry the schistosomiasis worms and eggs. The disease affects about 200 million people globally.

7. Cancer

Waters heavily polluted with chemicals such as MTBE and chlorinated solvents increase the risks of getting cancer when one drinks from such water sources. The

chemicals damage the DNA which causes cancer tumours. The disease is associated with high medical treatment costs, chronic pain, and death. Cancer has claimed the lives of many people across the world.

8. Hepatitis

Hepatitis is a highly infectious disease that affects the liver. It is acquired through ingestion of water contaminated with the hepatitis virus. Eating food washed with contaminated water can also spread the disease. Its symptoms include abdominal pain, jaundice, depression, fatigue, nausea, weight loss, and fever.

9. Intestinal Worms

Intestinal worms are parasites which can be transmitted by drinking contaminated water or consuming food washed with contaminated water. The types of intestinal worms include whipworms, hookworms, and roundworms/helminthes. The worms are responsible for retarded growth, anaemia and malnutrition especially in children. Intestinal worms affect about 10% of the population with the majority being children.

10. Dracunculiasis (Guinea Worm Disease)

Dracunculiasis is among the serious diseases caused by water pollution. It is also referred to as Guinea worm disease and is very common in Africa. A person is infected by the worm after drinking water contaminated with the larvae. The larvae then develop into a full-grown adult worm and later exits the body after approximately one year. A fully grown Guinea worm can extend up to a meter long and upon leaving the body, they leave one with incapacitating ulcers.

11. Lead Poisoning

The contamination of water with lead either from old pipes or the discharge of hazardous chemicals into water systems can cause lead poisoning. This makes it one of the life-threatening diseases caused by water pollution.

**Information continues
on page 24**

Children are at the greatest risk because when the metal gets into their body at elevated levels, it results in numerous health problems such as anaemia, problems with the reproductive system, and high blood pressure. Lead poisoning also has the potential of causing serious organ damage, especially to the kidneys and the nervous system.

12. Fluorosis

Fluorosis is a condition which negatively affects the health of teeth and bones as a result of consuming groundwater with high concentrations of fluoride chemicals. The chemical occurs naturally in groundwater and the disease affects more than 25 countries globally. It is estimated that tens of millions of people are affected by the disease worldwide.

13. Arsenicosis

Arsenicosis is a condition caused by chronic consumption of chemically polluted drinking water with small amounts of arsenic. Chemical poisoning by arsenic takes place over the long-term and exposure to the chemical contributes to cancer of the bladder, skin, kidneys, and lungs. The disease affects millions of people globally that depend on water polluted with arsenic. The symptoms of the disease include problems with

the bladder, kidney, lungs and skin (keratosis), which may advance into cancer.

14. Polio (Infantile Paralysis)

Polio is a serious viral infection associated with the poliovirus. It spreads through water contaminated with faeces from an infected person. When the virus enters the blood stream, it destroys the nervous systems and results in extreme weakness of the body. In most cases, it causes paralysis. Those who miss to get polio vaccination in childhood are at great risk of being infected by the virus. The symptoms include seizures, fever, headaches, and later on paralysis.

15. Trachoma (Eye Infection)

Trachoma, also known as eye infection, spreads through pathetic sanitation and hygiene caused by inadequate availability of safe water. It mostly affects children and women. About 6 million people worldwide have developed blindness because of the disease.

16. Gastroenteritis, encephalitis, stomach cramps and ulcers, and respiratory infections

These diseases are grouped under one category because they are referred to as water-washed diseases. They are primarily caused by lack of clean water for drinking and arise after an individual consumes water from polluted beach water. The diseases are mostly experienced in regions with highly polluted beach water.

17. Neurological problems, Liver and Kidney damage

Some cases of liver and kidney damage are associated with drinking water contaminated with chemical pollutants. Chemical pollutants such as MTBE and chlorinated solvents are the ones associated with such organ damages. The use of water contaminated with chemical pollutants may not cause major health disorders but are associated with the inflammation of the liver, liver failure, kidney failure, or the development of kidney stones. The chemicals can also aggravate other diseases that require the support or intervention by these organs. Some neurological problems such as ADHD are also associated with drinking water contaminated with chemical pollutants over an extended period of time.



By Mr Sizile Mnisi from
Communication and
Intergovernmental Relations

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 endeavour, including the labour 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 cannot grow.





USED CANS AND PLASTICS

Pollute Our Dams, Streams and Rivers

***Take action against pollution and be
involved in cleaning campaigns***

Tel: 013 753 9000 | Website: www.iucma.co.za

***Inkomati-Usuthu CMA, your
partner in water management***



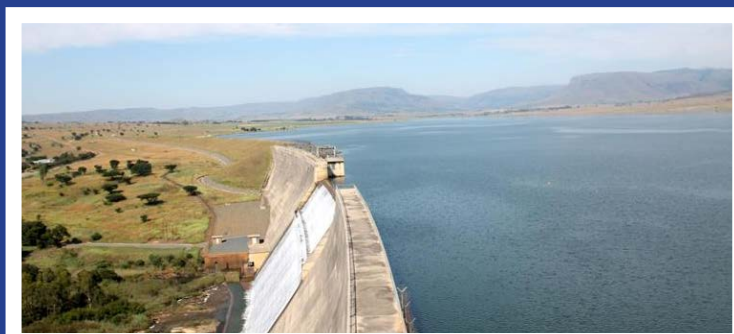
SOME OF THE DAMS UNDER INKOMATI-USUTHU WATER MANAGEMENT AREA



The **Primkop dam** has a total length of 5.88 km



The **Driekoppies Dam** along the Lomati river boasts a full capacity of 251 Mm³ and was opened in 1998.



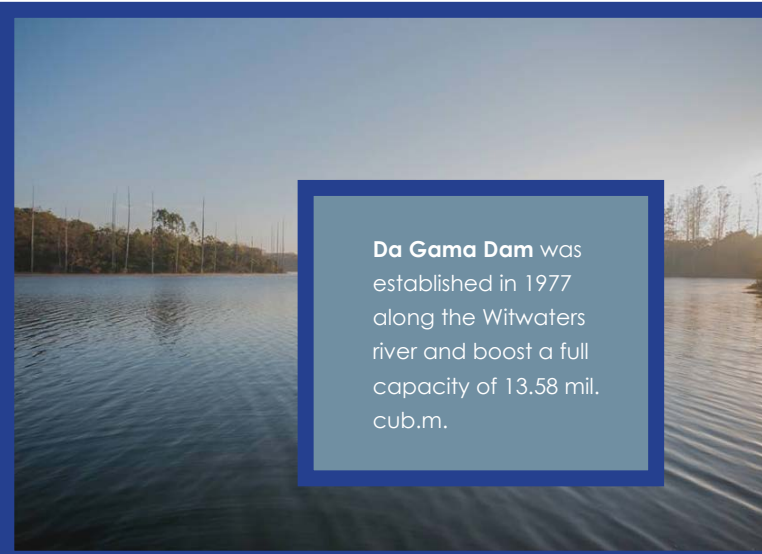
Located along Crocodile river, the **Kwena Dam** is a combined gravity and arch type boasting a total catchment area of 954 sq.km.



The **Vygeboom Dam** built in 1969 along the Komati river boost a full capacity of 78 mil.cub.m.



Injaka Dam along the Marite river boost a full capacity of 124 mil. cub.m.

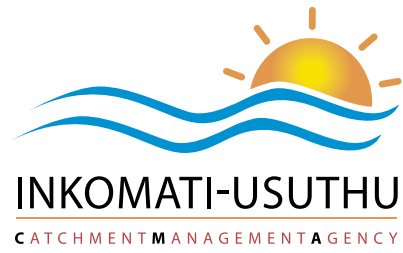


Da Gama Dam was established in 1977 along the Witwaters river and boost a full capacity of 13.58 mil. cub.m.

The **Jericho Dam** in Mpama river was built in 1966/68 with a full capacity of 59.5 mil.cub.m.



Witlip dam along the Sand river near Sabie was opened in 1969 boosting a full capacity of 12.97 mil.



**Illegal Sand Mining
in a watercourse is an
offense and is prohibited**

To report please call IUCMA @ 013 753 9000



REPORT WATER POLLUTION INCIDENTS

The IUCMA is aware that pollution incidents

occur occasionally in the the catchment. Therefore, for any water pollution incidents like sewage leakages and others, please report at water@iucma.co.za

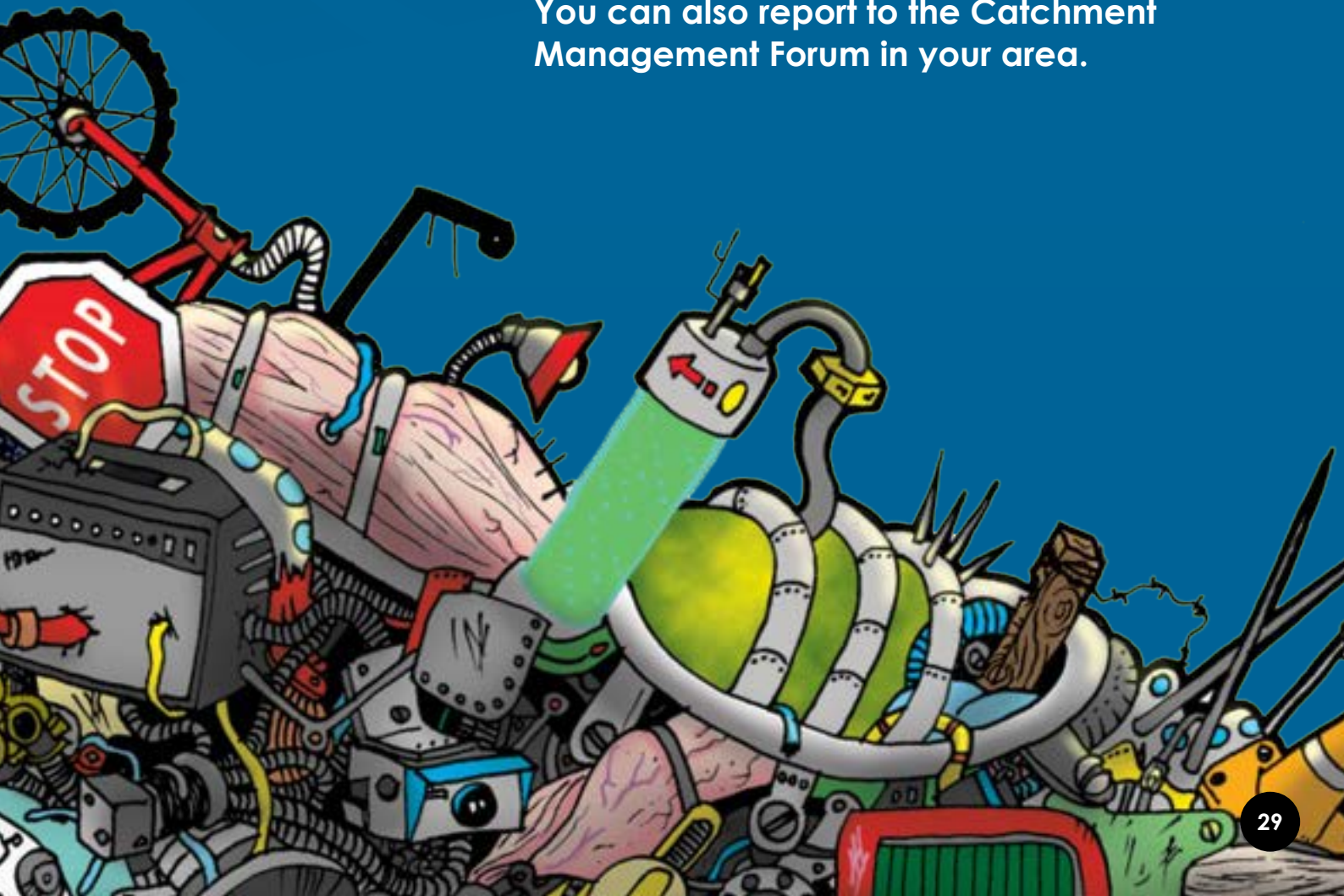


OR CALL US AT
013 753 9000

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.





PROVIDING ACCESS TO CLEAN WATER A PRIORITY

The Inkomati-Usuthu CMA must 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.

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 is not 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 do not 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; reduction of pollution in the water management area; empowering stakeholders, especially historically disadvantaged individuals (HDIs) 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.



DON'T DISPOSE OF NAPPIES IN RIVERS AND DAMS

*Dispose nappies in rubbish bins
and stop pollution*

Tel: 013 753 9000 | Website: www.iucma.co.za

*Inkomati-Usuthu CMA, your
partner in water management*



LEARNER'S CORNER

CIVIL ENGINEERING CONTRIBUTION IN WATER RESOURCE MANAGEMENT

What is Civil Engineering in Relation to Water Resource Management?

Civil engineering is a very versatile field which comprises of various disciplines such as transportation engineering, structural engineering, construction management, environmental engineering, geotechnical engineering, urban engineering, and water engineering. Water engineering is the main focus discipline that contributes in Water Resource Management (WRM) through planning, designing, maintaining, and managing the water-related infrastructures. The infrastructure, equipment, and systems for water resource management such as dams, canals and weirs are constructed under the supervision of a civil engineer (CE).

What Role does Civil Engineering Play in Fulfilling the Purpose of the National Water Act, Act 36 of 1998?

The CE ensures that the purpose of the National Water Act (NWA) according to section 2, protecting, developing, conserving, and managing the nation's water resources are met through the proper planning, designing, maintaining, and managing the water related infrastructures. The commissioning of Water and Waste Water Treatment plants are planned, designed, and managed by CEs to meet the basic human needs of present and future generations. According to the Constitution of South Africa, supplying water that is free of contamination is a basic human need. In essence, the CE ensures the sustainable use of water resource by conserving water through the construction of dams, reservoirs, weirs and conveying water to users. The CEs planning ensures holistic, integrated management of water which balances the growing demand for water use.





In addition to section 2(j) of the NWA, a CE solely promotes dam safety and ensures the public is protected from the safety risk of the dam wall breaking. Chapter 12 of the NWA allows the CE to be the only Approved Professional Person (APP) registered at the Engineering Council of South Africa (ECSA) with a duty of care towards the state and the general public. The APP contributes intensively to the conservation and impoundment of a nation's water resource through the conduction of dam safety evaluation and reports. It can never be denied that South Africa (SA) is a water scarce country and the Department of Water and Sanitation (DWS) conserves this scarce natural resource called water through the construction of dams owned by the state. These dams are designed, constructed, monitored, and maintained by CEs who are also APPs. The responsibilities of APPs pertaining to dams with safety risks are stipulated in section 119 of Chapter 12 in the NWA.

The Importance of knowing the Volume of Water within a Catchment Area

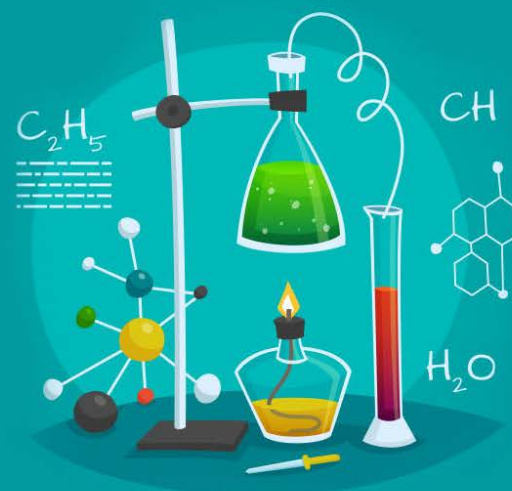
Since SA is a water scarce country, it is very exigent to know the quantity or the volume of water within a catchment in that specific water management area. CEs in conjunction with hydrologists play a very critical role in ascertaining the stream flow in a catchment. The result from the hydrological assessment carried out with the intention of quantifying the flow or volume of water in a catchment assists in promoting equitable access to water. The Water Responsible Authority and Catchment Management Agencies use such information to authorise the appropriate quantity of water to the prospective water users (applicants).



By Mr Mfundo Dlamini from Water Use Authorisation

CAREER GUIDANCE

FOR LEARNERS IN WATER RESOURCE MANAGEMENT



The Inkomati-Usuthu Catchment Management Agency (IUCMA) is an agency that has been established in terms of the relevant section of the National Water Act, Act 36 of 1998. The IUCMA has been established by the National Department of Water Affairs (DWA) in terms of the Act, to specifically implement certain sections of the Act. The mentioned sections of the Act address the management, protection, development and prevention of pollution of the national water resources.

The IUCMA is the first agency to be established by the DWA in the Mpumalanga area. The IUCMA has the responsibility to protect and manage the Crocodile River, Sabie, Inkomati Rivers and their tributaries within the Inkomati Water Management Area.

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/Manager

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

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)

LIST OF SOUTH AFRICAN UNIVERSITIES

EASTERN CAPE

NELSON MANDELA
UNIVERSITY

Tel: 041 504 1111
Website: www.mandela.ac.za
Email: info@mandela.ac.za

WSU
Walter Sisulu University

Tel: 047 502 2200
Website: www.wsu.ac.za
Email: postmaster@wsu.ac.za



RHODES UNIVERSITY
Where leaders learn

Tel: 046 603 8148
Website: www.ru.ac.za
Email: registration@ru.ac.za



University of Fort Hare
Together in Excellence

Tel: 040 653 2312
Website: www.ufh.ac.za
Email: admissions@ufh.ac.za

NORTHERN CAPE



SOL PLAATJE
UNIVERSITY

Tel: 018 299 1111/2222
Website: www.nwu.ac.za
Email: information@spu.ac.za

“For more Universities view page 36 and 37”

LIMPOPO



Tel: 015 962 8000
Website: www.univen.ac.za
Email: info@univen.ac.za



Tel: 015 268 9111
Website: www.ul.ac.za
Email: enrolment@ul.ac.za



FREE STATE



Tel: 051 507 3911
Website: www.cut.ac.za
Email: tomtomple@cut.ac.za



Tel: 051 401 2114
Website: www.ufs.ac.za
Email: Studentadmin@ufs.ac.za

KWAZULU NATAL



Tel: 031 373 2411
Website: www.dut.ac.za
Email: info@dut.ac.za



Tel: 031 260 2227
Website: www.unizulu.ac.za
Email: enquiries@ukzn.ac.za



Tel: 035 902 6000
Website: www.ukzn.ac.za
Email: info@unizulu.ac.za



Tel: 031 907 7111
Website: www.mut.ac.za
Email: info@mut.ac.za

NORTH WEST



Tel: 018 299 1111/2222
Website: www.nwu.ac.za
Email: applicationsug@nwu.ac.za

MPUMALANGA



Tel: 018 299 1111/2222
Website: www.nwu.ac.za
Email: info@ump.ac.za

GAUTENG



Tel: 011 717 1102
Website: www.wits.ac.za
Email: studentaffairs@wits.ac.za



Tel: 012 429 3111
Website: www.unisa.ac.za
Email: study-info@unisa.ac.za



**Tshwane University
of Technology**
We empower people

Tel: 021 382 5911
Website: www.tut.ac.za
Email: info@ump.ac.za



**UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA**

Tel: 012 420 4111
Website: www.up.ac.za
Email: ssc@up.ac.za



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Tel: 016 950 9214/5
Website: www.vut.ac.za
Email: reception@vut.ac.za



**UNIVERSITY
OF
JOHANNESBURG**

Tel: 011 489 3000
Website: www.uj.ac.za
Email: mylife@uj.ac.za

WESTERN CAPE



**UNIVERSITY of the
WESTERN CAPE**

Tel: 021 959 3900
Website: www.uwc.ac.za
Email: admissions@uwc.ac.za



UNIVERSITY of Cape Town

Tel: 021 650 9111
Website: www.uct.ac.za
Email: admissions@uct.ac.za



Tel: 021 808 9111
Website: www.sun.ac.za
Email: info@sun.ac.za

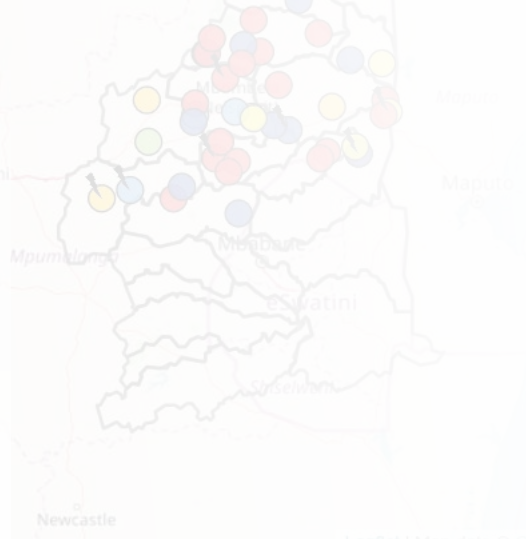


Tel: 021 959 3900
Website: www.cput.ac.za
Email: info@cput.ac.za



(X1H016) Buffelspruit 2:00:00	3.27	m ³ /
(X1H017) Komati Rive8:00:00	3.05	m ³ /
(X1H023) Canal From2:00:00	0.26	m ³ /
(X1H033) Komati Rive6:00:00	6.59	m ³ /
(X1H036) Komati Rive7:48:00	56.04	m ³ /
(X1H049) Lomati Rive2:00:00	1.70	m ³ /
(X1H052) Mlumati rive2:00:00	1.41	m ³ /
(X1H053) Komati Rive6:00:00	0.00	m ³ /
(X2H005) Nels River z6:00:00	2.00	m ³ /
(X2H006) Krokodil Riv7:48:00	6.53	m ³ /
(X2H008) Queens Riv2:00:00	0.42	m ³ /
(X2H010) Noordkaap 6:00:00	1.02	m ³ /
(X2H013) Krokodil Riv6:00:00	3.28	m ³ /

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

<http://riverops.inkomaticma.co.za/>

The link to the River Operations portal is also available on the website at www.iucma.co.za to access it go to the **home page of the IUCMA website**. **click Hydrology water quality status** then **click the river operations web portal link**

STEP 1



STEP 2



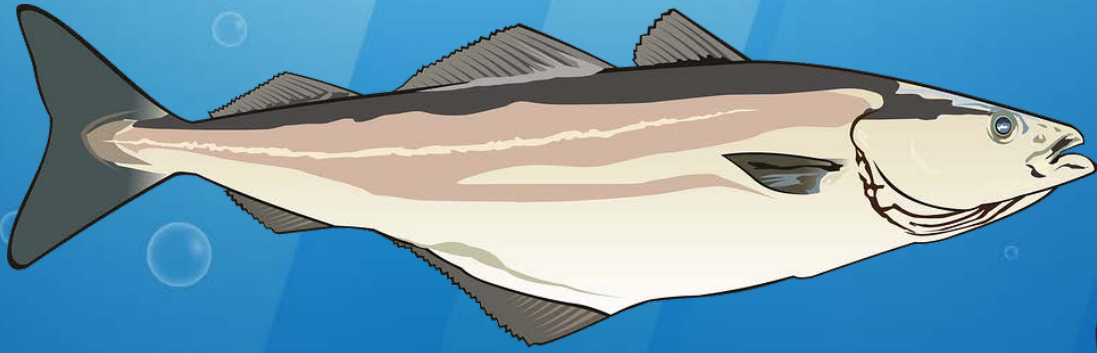
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EcoStatus definition

www.dwa.gov.za/IWQS/rhp/rh_assessment.html

17 Critical and Grievous Diseases Caused by Water Pollution

<https://www.conserve-energy-future.com/critical-and-grievous-diseases-caused-by-water-pollution.php>



PROTECT OUR STREAMS

*Take action against pollution and be
involved in cleaning campaigns*

Tel: 013 753 9000 | Website: www.iucma.co.za

*Inkomati-Usuthu CMA, your
partner in water management*



**Private bag X11214,
Mbombela, 1200**

**Suite 801, The MAXSA Building,
13 Streak Street, Mbombela, 1200**

**Tel: 013 753 9000
www.iucma.co.za**



INKOMATI-USUTHU

CATCHMENT MANAGEMENT AGENCY