CSO BULLETIN

A Publication of the South African Water Sector Civil Society

July 2017

PRESERVING OUR STREAMS, ENSURING RIVER HEALTH

WATER RESEARCH COMMISSION

WIN-SA
WATER INFORMATION NETWORK
- SOUTH AFRICA -

DEAR READER

The role that civil society plays at a community level is crucial and contributes towards the Water Research Commission, Department of Water and Sanitation and partner organisations' responsibility to protect and conserve water resources and involve local communities. It is also the responsibility of communities through the civil society groups to look after water resources. This edition of the bulletin showcases excellent work done in some of our catchments and provides best practice that everyone of us needs to draw lessons from.

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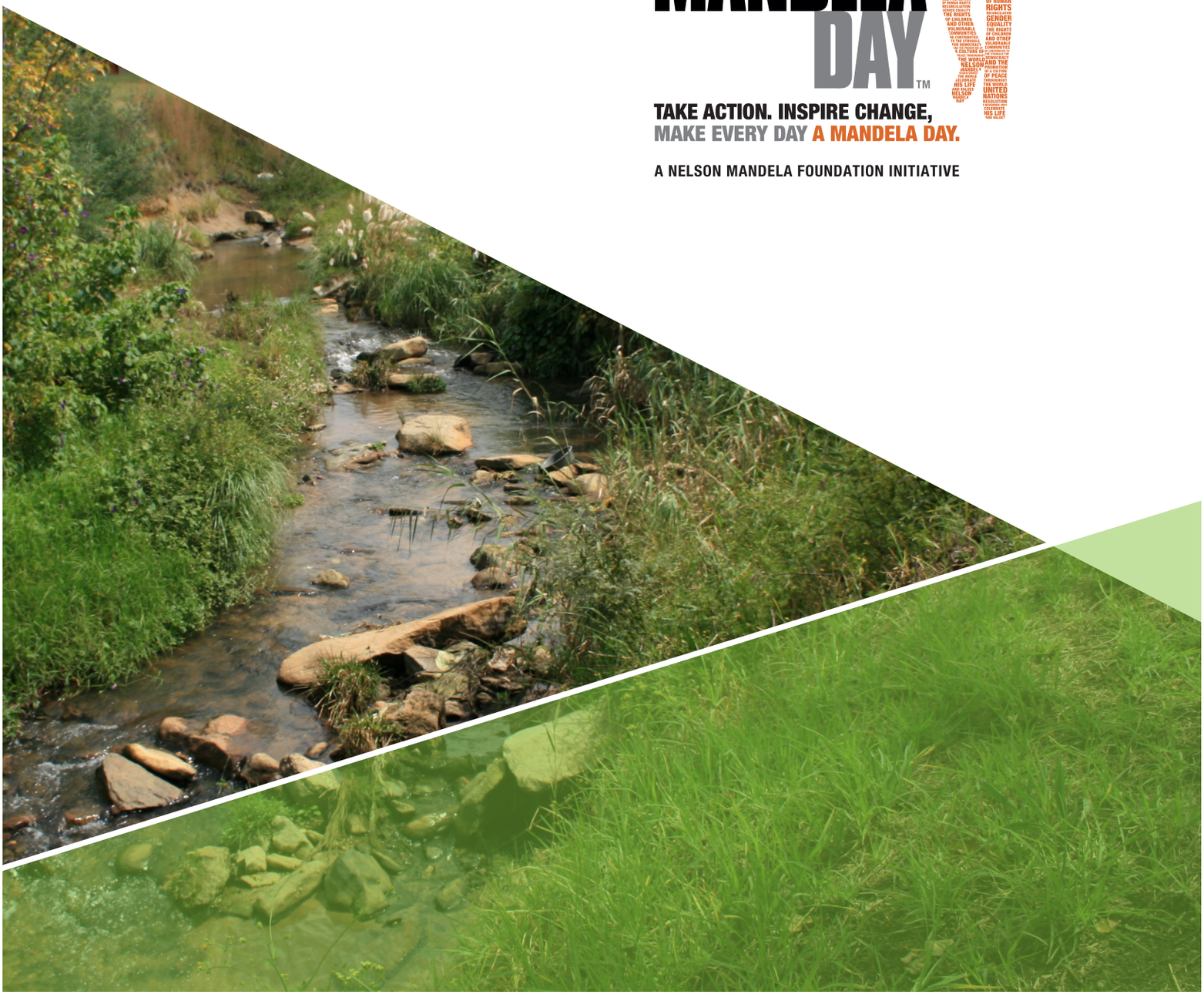
18TH JULY 2017

NELSON MANDELA DAY™

TAKE ACTION. INSPIRE CHANGE,
MAKE EVERY DAY A MANDELA DAY.

A NELSON MANDELA FOUNDATION INITIATIVE



"I am, therefore, a totally committed water person"

Nelson Mandela

Approximately 50% of South African rivers are polluted – in a country where the majority of the people are still dependent on surface water, the facts are concerning. Special events such as Mandela Day provide opportunities for communities to learn about the importance of rivers and to use their knowledge to bring about change.

i4WATER, Ground Truth, Wildlife and Environment Society of South Africa(WESSA) and the Water Research Commission (WRC) are passionate about maintaining river health and quality by helping people realise the importance of clean river systems. This is achieved through education and creating awareness about river health. Ground Truth and its partners, i.e., the WRC, WESSA, Department of Science and Technology (DST) and Department of Water and Sanitation (DWS) have developed 'citizen science' tools for measuring river health to aid ordinary South Africans to test the health of their local rivers and streams.

On Mandela Day 2017, i4WATER, GroundTruth, WESSA and the WRC have partnered to host an international event to raise awareness about the plight of our polluted rivers, and you can be a part of this event too – it is really simple!

"All you need to do is go down to your local stream or river and assess the quality of the water in the river. You don't need to do anything fancy, just have a look, take a deep breath, and tell us what you find. Is the water clear and clean-looking, or is it grey and full of scum on the surface? Does the water smell good, or does it smell of sewage? Once you have done this, please complete the score sheet and send it back to us! It's as easy as that," says Kirsten Mahood from i4Water. "And if you do want to do more, for example a miniSASS, please do! And remember to take plenty of pictures, and submit those too, "she adds.

Are you a committed water person?

"We can change the world and make it a better place. It is in your hands to make a difference."

Nelson Mandela

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

i4WATER
Institute for Water Alliances: Training Education Research

WATER RESEARCH COMMISSION

WESSA
PEOPLE CARING FOR THE EARTH

GroundTruth
Water, Wetlands and Environmental Engineering

Although general findings may be made public, any personal information (name, contact information etc) will be held in the strictest confidence. If you would like to participate, but would not like your findings to be made public, please indicate this on your form.

NEW CITIZEN SCIENCE TOOLS ON BOARD

The WRC in collaboration with i4WATER, GroundTruth, WESSA have been working hard to develop the new citizen science tools to address different components of water quality and quantity monitoring in our rivers.

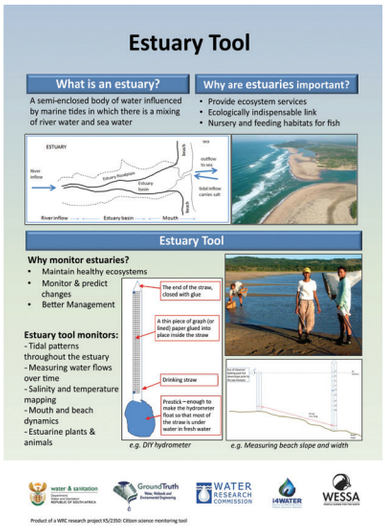
According to project leader Dr Mark Graham of GroundTruth some of these tools look at additional water resources. For example, the Estuary tool Eprovides users with background information on estuaries, their importance, and simple techniques that a citizen scientist can use to assess the ecological condition of an estuary. For example, the velocity plank is used to measure how fast water is flowing in a stream (stream flow velocity), as well as discharge. Such measurements are important, as flow has an impact on water quality and river organisms.

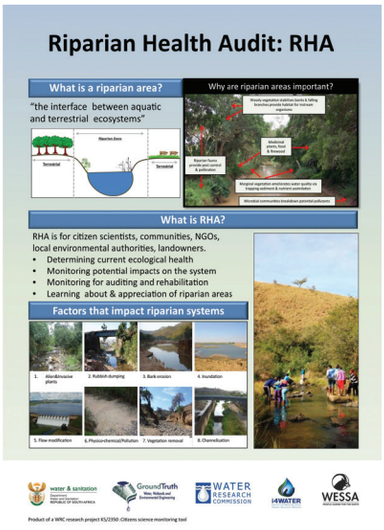
Mr Bonani Madikizela, who is managing the project at the WRC says, "Generally, with the use of the user guides, the tools can be used by most non-scientists. However, there are one or two tools (such as the Wetland tool) that may require some technical background. Also, making the rain gauge does require some calculation skill."

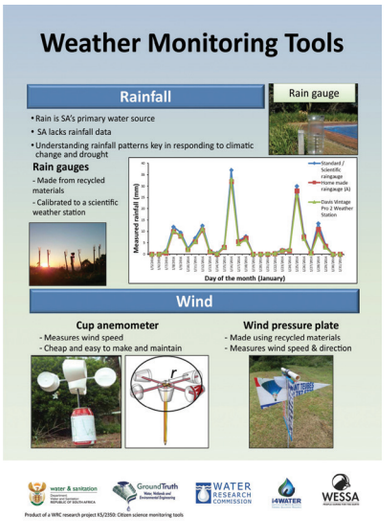
"The project is now developing a portal, which will be provided to WRC to host (or to find a host for the portal)," adds Kirsten, who co-managed the project at i4Water.

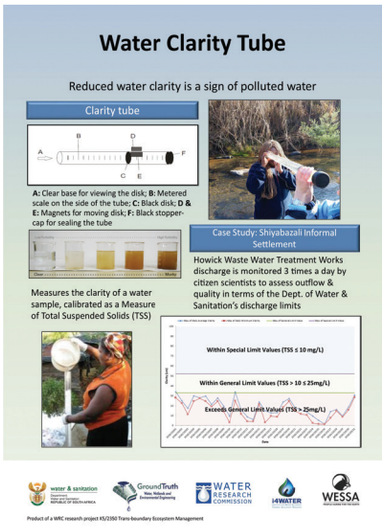
"This portal will provide access for any user to download the manuals for any of the tools. However, some tools do need to be bought or made. The miniSASS kit, clarity tube and velocity plank can be bought from Ground Truth," says Kirsten.

'Snapshots' of some of the new river health tools

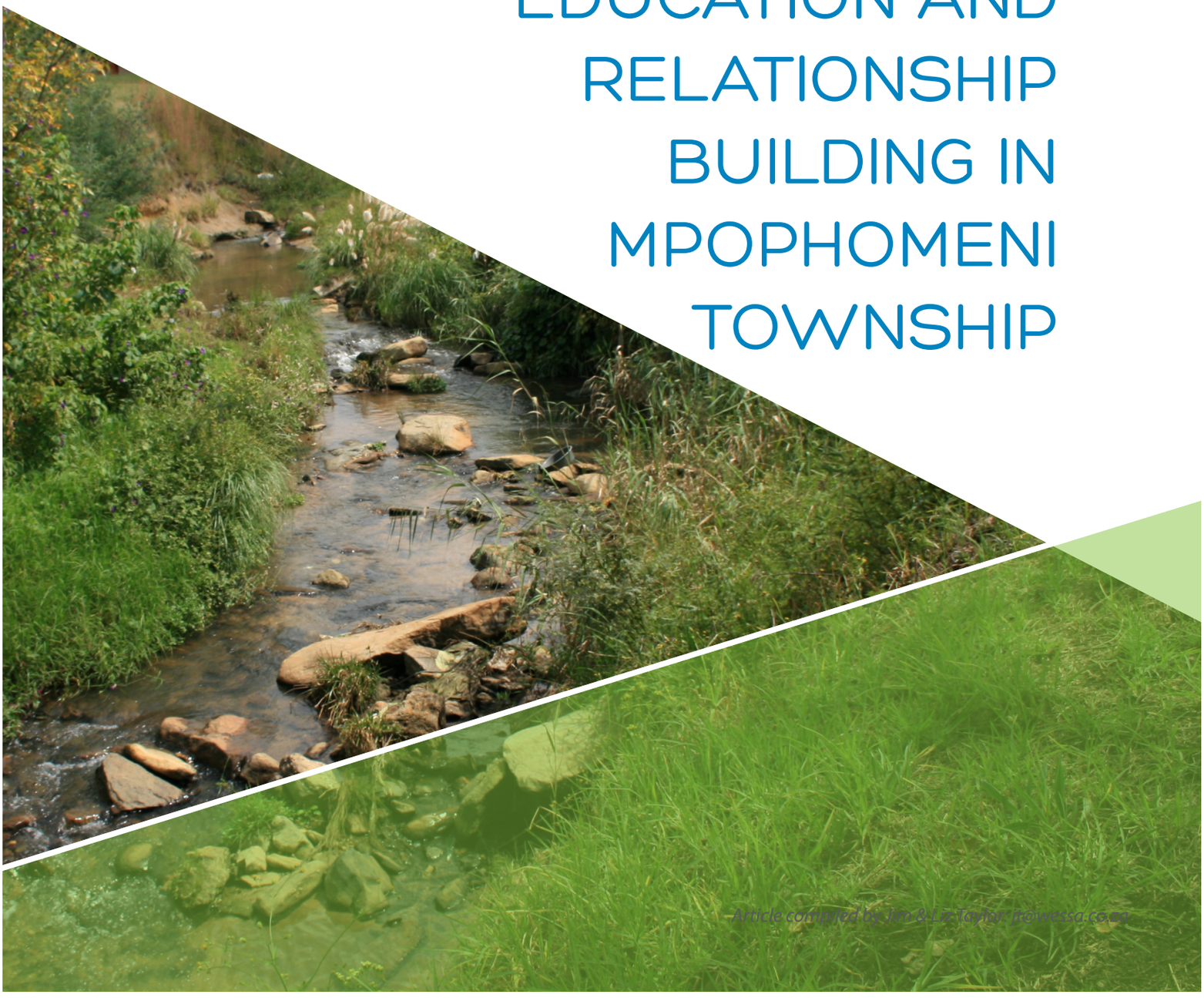








ENVIRO-CHAMPS: A SUCCESS STORY OF COMMUNITY MOBILISATION, EDUCATION AND RELATIONSHIP BUILDING IN MPOPHOMENI TOWNSHIP



Article compiled by Jim & Liz Taylor: jt@wessa.co.za

Enviro-Champs is an active community group within Mpophomeni Township in Pietermaritzburg. This group has turned their environmental challenges into opportunities for building resilience, and to team up against environmental degradation in a way that benefits everyone in the neighbourhood.

As defined by Dr Jim and Ms Liz Taylor who are working closely with this community group, the Enviro-Champ is any person who seeks to enhance the conditions of her or his immediate neighbourhood by addressing environmental problems or by linking the problems to those who may be able to solve them. In this context, the emphasis is "close and local action" for a more sustainable future. This community group has worked very hard to turn the situation around in Mpophomeni Township.

The challenge

For over 20 years sewage has flowed from Mpophomeni Township into Midmar Dam. This is a serious problem for KwaZulu-Natal since Midmar Dam supplies virtually all the water for Durban and Pietermaritzburg, South Africa's second largest economic hub. "One can even see the green swathes from the surcharging sewers on satellite images", says Jim Taylor, Director for Environmental Education at WESSA.

In 2012, Sbu Khuzwayo, Mdu Mchunu and Liz Taylor established the Enviro-Champs, through DUCT, as an effort to provide a bottom-up and top-down mechanism to change the situation for the better. This was potentially a powerful form of resilience by design!

Liz Taylor, Chairman of the DUCT Howick Branch and Manager of the Mpophomeni Enviro-Champs says, "In sharing this story we foreground the evaluation processes that we are using to try to understand social change processes better. A series of 10 principles of human capacity development were also used, as a lens, with which to shape our learning programmes."

According to Jim Taylor, after three and a half years of consistent effort, much awareness raising and productive cooperation, it seemed as though nothing measurable was being achieved. The sewage and solid waste continued to flow and accumulate. The Enviro-Champs had done careful monitoring and had all the statistics at their fingertips, recorded on a pivot-table in Excel. This monitoring record included when or where the spillages were, who was notified, how long the call-out time took, who fixed the leak, how long before it spilt again, etc. All of the data recorded in the monitoring table is linked to geographical coordinates and social media is used to enable all to share and contribute to solving the issues.

A turning point …

Towards the end of 2015 the situation reached a tipping point and a directive was sent from the national Department of Water and Sanitation (DWS) to send in a team to fix the problem areas. By the 21st of December 2015 the sewers stopped continuous spilling! This is a success story but it was not only due to the Enviro-Champs and their activities – everyone started to pull their weight. Thanks to the help received from uMgungundlovu District Municipality (UMDM), local municipalities, DWS, Umgeni Water, WRC, GroundTruth and WESSA who provided human capacity development and career pathing for the Enviro-Champs.

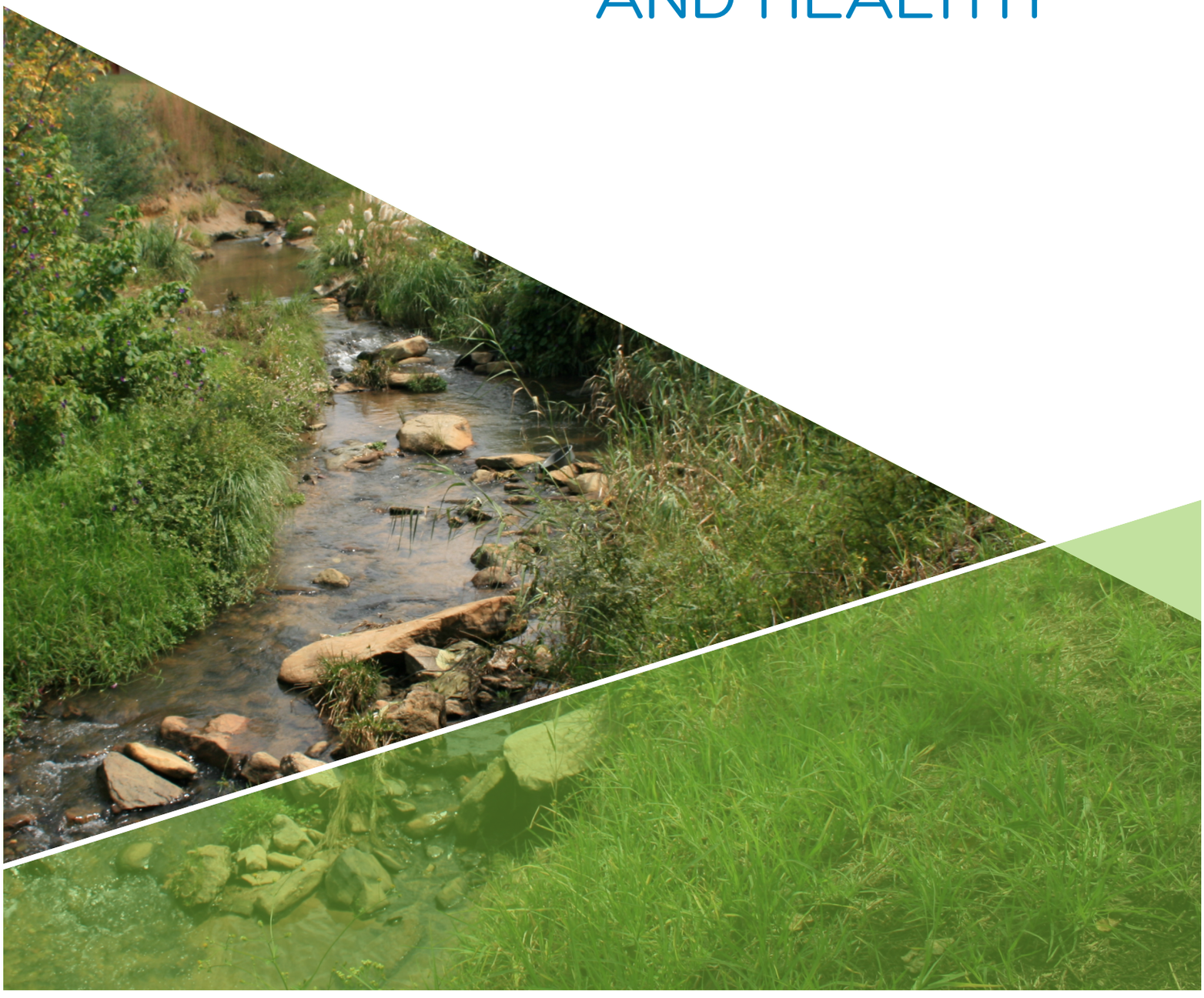
Seeking to understand change

Jim stresses that the Enviro-Champs project has managed to contribute to relationship building, education and engaged citizen science, and really in achieving more sustainable living. Accredited training courses, offered by WESSA, also supported the processes. The courses require participants to undertake a 'Change Project' through which they change their work or home-based practices as a result of the insights received in the training courses. The Change Projects then provide evidence which is assessed towards the accreditation.

What worked – in a nutshell

"Clearly the combination of citizen science tools, 'close and local' activities, as well as relationship building with key stakeholders all supported the productive changes we now see in Mpophomeni," notes Liz. According to Jim a well-designed and engaging Education for Sustainable Development processes enabled a groundswell of possibility, which, when coupled with knowledge, understanding and engagement really made a remarkably positive difference in a challenging township context.

DUCT KEEPING UMNGENI AND UMSUNDUZI WATERWAYS CLEAN AND HEALTHY



Dusi Canoe Marathon in uMngeni River

KwaZulu-Natal is blessed with a visionary non-governmental organisation located at the heart of Pietermaritzburg with many years of experience in championing river health. The organisation, popularly known as DUCT (Dusi uMngeni Conservation Trust), has displayed its dedication and enthusiasm to confront and reverse perpetual river degradation that is prevalent in the uMngeni and uMsunduzi catchments. All it takes is some patience, commitment and perseverance.

In 2014 DUCT was the winner of the Mail & Guardian newspaper's Greening the Future Award in the Community Conservation category. Later that year, the organisation went on to win an Eco-Logic Award in the Water Conservation category. The organisations continues to win the hearts and minds of the people living in the uMngeni and uMsunduzi catchments where the organisation is active.

The organisation was formed back in 2005 and has now grown to include many more people who are passionate about river health. DUCT is comprised of a core group of volunteers that continues to steer its activities, including several water professionals who are well-known members of the water research community such as experienced river health researchers Dr Mark Graham and Dr Colin Everson. The organisation now boasts over 300 people on its payroll. In a country where unemployment is at crisis level, this is something which the DUCT Board is very proud of.

Canoeists question water quality

This organisation was initially centred around a prominent water sport event, the Dusi Canoe Marathon which indirectly inspired the establishment of DUCT. As South Africa's premier canoeing event, the Dusi attracts 1 600 paddlers every year, along with their supporters, and has become part of the culture of the region. Over the years the Dusi has been a crucible for South Africa's top paddlers, several of whom have brought honour to the country by winning titles at the annual World Marathon Canoeing championships, including five-time men's winner and reigning champion Hank McGregor.

The deteriorating quality of the uMngeni and uMsunduzi rivers that led a small group of paddlers to establish DUCT 12 years ago. "Since the formation of DUCT in 2005 and its official registration in 2006, the organisation has grown to include those who are passionate about river health in this region", says Dave Still, the organisation's Chairman.

River health vision

The vision that DUCT has is simple yet significant. The organisation is driven by the vision to have an ecologically healthy and biologically diverse uMngeni-uMsunduzi river system that provides sustained ecological goods and services for the communities that depend on them for their survival.

DUCT also envisages that communities will show respect for the rivers and will eventually take ownership and responsibility for the condition of their rivers while seeking to preserve their natural function and beauty.

DUCT envisages rivers where water quality and quantity are maintained at acceptable norms with healthy natural riparian zones and where the biological diversity is preserved. They have a vision of a community where all residents possess a basic understanding and appreciation of their river ecosystems. They see government, business,

the scientific community and civil society cooperating in providing the resources to effectively manage the river systems.

The biggest question to ask is: How has DUCT managed to mitigate the challenges it meets to realise their vision? The organisation recognises that the problems with the health of the rivers are large and have not developed overnight. The organisation also realised that working in silos does not help. Success can only be achieved through progressive, combined and sustained actions by partnership with government and civil society.

According to Still, rivers reflect a great deal about our values as a society: "Rivers do not lie. If your city does not have a functional waste management system and if too many people do not care what happens to their waste, then far too much of that waste is going to end up in the river. If your city is not spending enough on the construction, operation and management of its sewage systems, then too much sewage is going to end up in the river. If your landowners – public and private – do not make an active effort to stem and defeat the tide of alien vegetation invading their land, then fairly soon the indigenous vegetation will disappear, with all the attendant consequences."

DUCT achievements to date

DUCT functions in different ways. The organisation lobbies for higher priority to be given to any actions and programmes which will improve river health, such as the removal and control of invasive alien plants, the improvement of waste management systems and the implementation of the environmental flow provisions of the National Water Act of 1998. In many instances, it provides skills and manpower to give effect to those actions and programmes, particularly where there is something new that needs to be tried out or demonstrated. Furthermore, DUCT monitors matters which have a direct bearing on river health, such as sewage pollution, uncontrolled sand mining operations and illegal dumping. These are the biggest challenges that DUCT finds itself dealing with.

Amongst others, the organisation works on raising public awareness of river health issues through the education of school groups, public campaigns and the use of the media. Also, DUCT provides access to a network of highly experienced professionals with relevant skills, and uses these skills to formulate proposals and to manage programmes which are making a difference to communities.

DUCT has several programmes through which it carries out its work, some of which include; river care and alien weed control, monitoring sand mining, involving communities and sewage monitoring. It is these programmes that have been carried out over the years that have led to some very notable successes.

Hyacinth removal project

DUCT provides access to a network of highly experienced professionals with relevant skills, and uses these skills to formulate proposals and to manage programmes which are making a difference to communities.

DUCT was responsible for the development of a **floating trash boom** which has been installed above Campsdrift and intercepts a large percentage of the floating trash which comes down the river. DUCT maintains this boom and bags the waste it collects.

A community **river clean-up day** takes place in September each year, in conjunction with the international Coastal Clean-up and Clean-up the World days. In parallel, DUCT has organized a primary school's environmental art competition, reaching 3 000 children.

The **River Care Project,** funded by the National Lotteries Board, employs 10 teams of 10 to 15 employees each to remove solid waste as well as alien invasive plant species from the the Msunduzi and uMngeni Rivers. These teams also monitor the rivers for sewage spills and industrial waste dumping, as well as illegal sand mining activities. Not only does this project help DUCT to achieve their mission and objectives, it also allows DUCT to create employment and eradicate poverty.

A partnership with the KZN Department of Agriculture's **Invasive Alien Clearing Programme** and the uMsunduzi Municipality has resulted in a significant reduction in the amount of invasive vegetation in the Pietermaritzburg section of the uMsunduzi.

A more recent development has been DUCT's involvement in the **Durban Green Corridor,** a partnership project with eThekwini Municipality. The programme seeks to integrate nature rehabilitation, conservation and environmental awareness, youth development and local economic growth through adventure sport and ecotourism within the uMngeni River valley.

Of course, all of these achievements don't happen in the absence of obstacles. But it is the champion spirit with which the organisation takes on its work that has ensured budgets are being allocated by the relevant authorities for sewer upgrades and upgrades of sewage treatment plants, for invasive alien plant removal and for improved land care in general.

River care and alien weed control

One of DUCT's first actions following its establishment was to form a number of River Care Teams to physically clean up the uMngeni and uMsunduzi rivers. DUCT defines river care teams as a group of well-trained, well-equipped and motivated workers who are based on a particular stretch of river about 10 km long.

On this stretch their work includes control of invasive alien vegetation, trash collection and removal, prevention of illegal dumping and reporting of sewage or industrial pollution. The number of teams depends a lot on funding, and typically varies between 6 and 14.

A big part of DUCT's current work is controlling alien invasive plants. Aquatic weeds, in particular, spread amazingly fast, doubling the area they infect in as little as 10 days (depending on the temperature and nutrient levels in the river). Hyacinth, water lettuce, Kariba weed,

Sand Mining activity along uMngeni River

azolla, ludwigia and parrot's feather are some of the more common aquatic weeds found in the uMngeni and uMsunduzi Rivers.

Lotto funding from 2010 to 2013 enabled River Care Teams to make significant inroads with alien invasive plant control over a 100 km zone. With support from the Department of Environmental Affairs, DUCT is able to access herbicide for both terrestrial and aquatic work, and has been loaned boats for spraying the aquatic weeds. DUCT further liaises with the South African National Biodiversity Institute (SANBI) to treat emerging weeds, such as Mauritius hemp and pompom weed.

Community awareness and education programmes

Community groups and school children have learnt a lot from the educational activities that are championed by DUCT around the uMngeni and uMsunduzi Catchments, such as the International Coastal Clean-up day in September, whereby community groups are mobilised to dedicate their time to removing garbage from rivers. These activities have attracted the participation of provincial and local government.

DUCT also has a school's education programme aimed at raising environmental awareness among youth, facilitating youth action towards rehabilitation and restoration, and encouraging creative expression in caring for our environment, among others. The programme further encourages the concept of communities working together towards the goal of clean and healthy river systems and encourages collaboration with other schools.

For more information visit: www.duct.org.za

WISE WAYZ WATER CARE PROJECT: COMMUNITY WATER STEWARDSHIP

Wise Wayz Water Care
One river One team

Article compiled by: i4WATER officials
Ntswaki Ditlhale: ntswaki@i4water.org and
Kirsten Mahood: kirsten@i4water.org

South Africa is at the tail end of what is considered one of the worst droughts to hit the country. Against this devastating backdrop emerged a group of 130 inspirational volunteers, ranging from youth to gogos and mkhulus, who have committed themselves to effectively managing the water resources and ecological infrastructure of their catchment. Through funding from the AECI Community Education and Development Trust, the Wise Wayz Water Care (WWWC) Project was formed to support the volunteers with skills development and career path opportunities in water resource management, enabling them to do their voluntary work effectively and, most importantly, to support their livelihoods.

The Wise Wayz Water Care Project was formed in February 2016, and is based on the lower Mbokodweni Catchment with two communities participating, Folweni and Ezimbokodweni, working alongside each other with one mission – to create a clean and healthy environment – "One river, one team, one mission". The WWWC volunteers have adopted a 30 km stretch of river in the lower Mbokodweni catchment. The catchment and its communities are faced with challenges ranging from illegal solid waste dumping and disposal, alien plant infestations, poor aquatic health, effluent discharging directly into the river systems, freshwater leaks and illegal sand mining.

"The project has taken a novel, holistic approach to deal with these issues, emulating a bottom-up approach, where community members take ownership of restoring ecosystem health, while at the same time improving their livelihoods," comments Ntswaki Ditlhale, the Project Manager at i4Water.

"This is necessary to address socio-economic, community and environmental issues, as a project cannot hope to alleviate challenges in one of these aspects of concern without addressing the others," says Ntswaki.

To achieve this, the volunteers have identified 6 interventions where they have received training and mentorship support to develop capacity. These are:

- Water quality monitoring by volunteers using citizen science tools developed by WRC project K5/2350
- Invasive alien plant removal and control
- Community engagement on issues of solid waste, water leaks, infrastructure monitoring and education
- Recycling and the development of buy-back centres
- Community vegetable gardens with the potential to upscale to commercial agriculture
- Solid waste removal from water courses
- Safety Health & Environment (SHE) also forms an integral part of training and awareness

The two-pronged approach of this type of programme sees the teams improving water quality and quantity by removing solid waste and invasive alien plants, and at the same time developing capacity within the broader community to understand the impacts of their actions on the environment. The development of capacity will facilitate better decision making in dealing with key environmental issues.

Teams engaging with their fellow community members in a knowledge sharing and receiving dialogue to build the understanding of socio-ecological challenges and come up with collective solutions.

The added component of environmental monitoring ensures that the teams are able to track the impact that their efforts are making on the quality of the water entering the Mbokodweni River.

Far left: Teams removing solid waste from a stream Middle: Volunteers who are part of the monitoring team testing the quality and health of the river using citizen science tools such as the E. coli swab to measure the amount of E. coli colonies present in the water, and (far right) using a clarity tube to measure the clarity of the water

Ntswaki further stressed that another unique component of the project is the partnership between business, community and local municipality. Through funding from the CEDT the volunteers have been able to focus their work and take it to a new level where their efforts are measured and they are acknowledged for the contribution that they are making to improve river health.

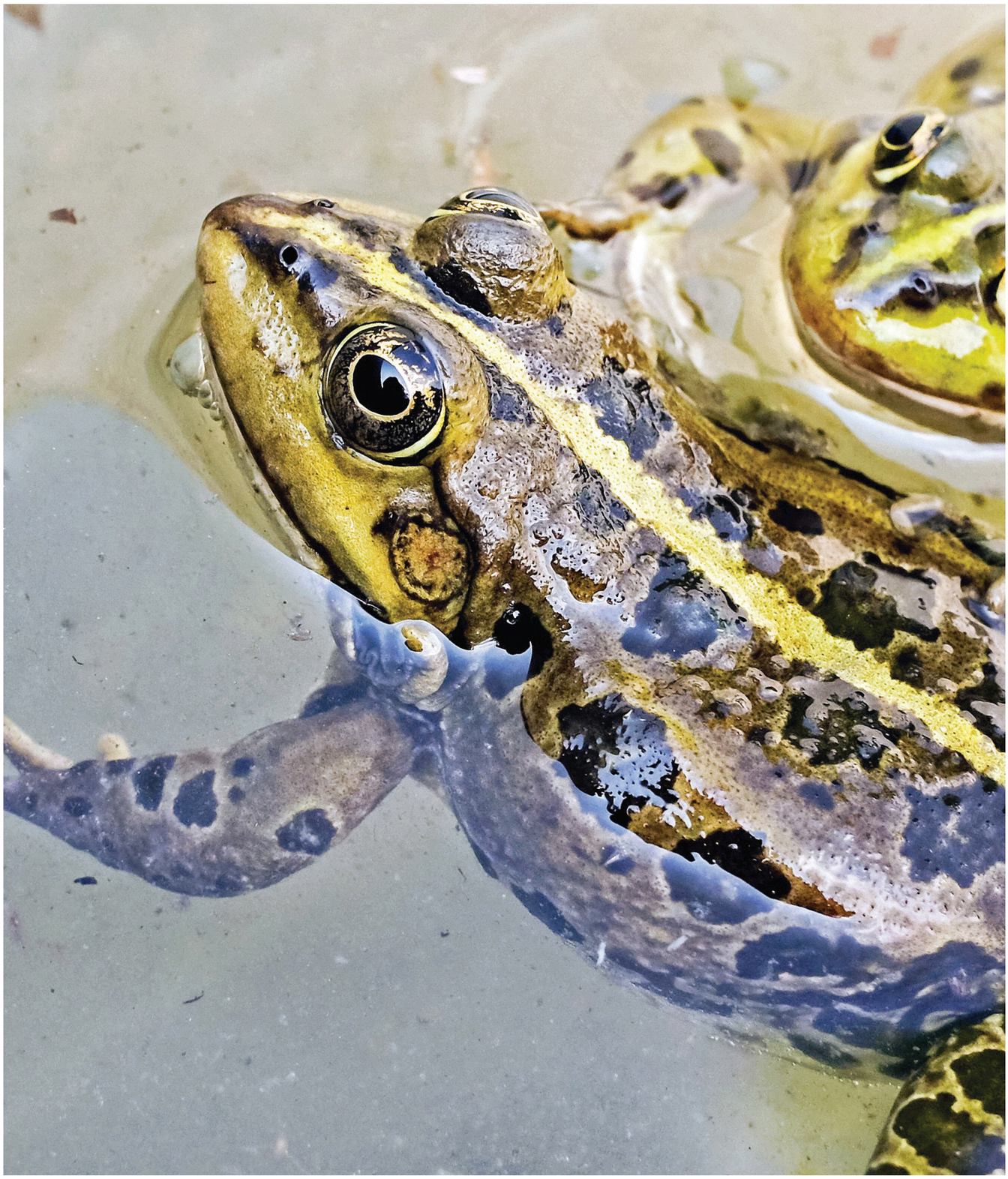
Kirsten Mahood, who co-manages the project with Ntswaki, says, "The role of local municipality cannot be overlooked, and they have played a critical role in supportive training and engagement, to promote a sense of self-worth within the teams, knowing that the work they are doing is recognised by the municipality for the value it is adding to the City."

Kirsten further adds, "An example of this is that teams identified a municipal water pipe that had been leaking for over 3 years (8 million litres of potable water lost in that time!)". Through understanding the reporting structures within eThekwini Municipality, the team reported the leak and it was resolved within a week of reporting."

According to Ntswaki, to achieve these outputs much emphasis has been placed on intensive training and skills development, which has included SHE, water safety, environmental monitoring, and the development of a research programme to create useful data to share with the key role players, such as AECI, local government and the community.

Top: WWWC volunteers recycling solid waste removed from streams and rivers. Bottom: Volunteers removing alien invasive plants in one of the streams

The volunteers of Wise Wayz Water Care have seen the bigger picture of the impact that they are having, not only on the environment, but also their own livelihoods, and that of the community at large. They are grabbing opportunities with the intent to grow their initiatives. In a country where volunteerism on a large scale is almost unheard of, these teams are bucking the trend and charting a course to a better South Africa for all.



ENLISTING CITIZEN SCIENTISTS TO MONITOR RIVER HEALTH

Middelburg Muslim School learners testing water quality using a clarity tube

Taking stock of a river's health is now in anyone's reach – Water Research Commission introduces miniSASS to Middelburg Muslim School

South Africa needs talented and innovative young scientists who can engage with and begin to solve the problems we currently face. On 9 May 2017, the WRC, in partnership with independent aquatic scientist Mr Byron Grant (from Johannesburg) and with the assistance of Ms Shaakira Akhalwaya, an environmental manager from a local mine, ran a one-day miniSASS demonstration session with learners at Middelburg Muslim School in Mpumalanga.

The aim was to introduce miniSASS as a river health tool that could be used by the school to monitor and take care of the nearby river. Both teachers and learners were trained on how to use miniSASS.

"Most South African schools are located close to the rivers and they can easily monitor the water quality and be the eyes and ears on the ground for the country," says citizen science tools developer Mark Graham of GroundTruth.

Middelburg Muslim School is situated next to the Klein Olifants river which is a tributary of the Olifants river.

With Mpumalanga being a mining- and agriculture-intensive province, the Olifants River catchment has a lot of pollutants that eventually drain into the streams.

An easy to use citizen science tool called miniSASS enables ordinary South Africans to become 'citizen scientists' and track river health.

MiniSASS, a community river health-monitoring tool designed for use by non-experts, was developed with funding from the WRC. It enables budding amateur scientists to use a simple aquatic biomonitoring technique to monitor the health of rivers and streams.

While the Klein Olifants river looks healthy and clean, it was surprising for the students to learn that their miniSASS score indicates the stream to be in a very poor state.

This result followed a rigorous analysis of macroinvertebrates such as beetles, leeches, dragonflies, minow mayfies and many more. There are up to 13 families of macroinvertabrates that are analysed and identified to derive a miniSASS score. According to miniSASS, some macroinvertebrates are highly sensitive to pollution and would fail to find suitable habitats in an unhealthy stream.

Says Bonani Madikizela, WRC research manager, "This biological water quality monitoring tool can be used by Grade 1 learners, community members and doctoral students alike. It employs simple yet rigorous science to produce data that gives an indication of river health." MiniSASS allows for a simple understanding of the technically complex macroinvertebrate bioassessment technique SASS5.

Madikizela further says, "The miniSASS forms part of a bigger toolkit which can fit in a 1 m x 1 m suitcase, yet gives you access to the world within one single river." It uses the composition of invertebrates living in rivers and is based on the sensitivity of various animals to water quality.

It couldn't be simpler to become a budding amateur river scientist. The toolbox itself consists of things like a simple sampling net, tray, flow meter and a clarity tube. It also includes a site information sheet to record samples found and provide ecological health information about the site. Support tools, such as field guides, assist identification and help users understand more about the bugs and worms

in the water. More tools are under development that can be used for monitoring wetlands, estuaries, rainfall and temperature.

An interactive website enables miniSASS users to upload their results and coordinates to an online map-based data portal. miniSASS is also available as a smartphone App.

To date, this citizen science project has already proven extremely valuable to track the state of local rivers, ays Madikizela, "Currently, river health is deteriorating in many places although South Africa has sophisticated water legislation. MiniSASS allows for communities to play an active role in the monitoring of water quality of rivers in their area."

Many of the rivers meandering through the country are in a precarious state due to overuse and abstraction, irresponsible agricultural practices, irresponsible mining and other forms of pollution. The need for capacity building, public awareness and participatory approaches towards water resources management is, therefore, becoming increasingly important. Madikizela emphasises, "Almost 48% of our rivers are considered 'threatened'. We need to understand the state of our rivers to manage them. Monitoring has no substitute."

"MiniSASS allows kids and adults alike to kick over some stones and get surprised by what is living underneath it in a stream or a river. At the same time, valuable data is collected about the state of our rivers that can be used to influence policy and management change. It shows great promise in generating a national database of citizen-collected river health information."

In his remarks Mahomed Russol, Middelburg Muslim School principal said, "I salute all of you for the enlightening experience regarding miniSASS. It was field work that was enjoyed by the learners and teachers alike. You have indeed added an invaluable paradigm as to how we should interact with a river system to maintain it in a natural state."

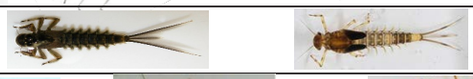
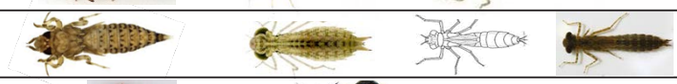
Russol further said, "We appreciate you empowering us as to the functioning of the tool and your unfolding of the programme was beyond reproach. You can be assured that 'Adopt A River' will be launched soon. You have sown the seeds of interest and the school will have to nourish and sustain this."

miniSASS App adds value to river health monitoring

An active, user-friendly central Internet data portal for miniSASS data submission has now been developed to empower every community and school in South Africa to become part of an international network of river health monitors. With the miniSASS App, one is immediately able to locate one's nearest stream or river and see what the stream's current river health index is. If the stream does not have a river health undex, the App guides the user to develop one using indicator species (sensitive invertebrates that live in our rivers and streams).

Dr Jim Taylor (WESSA) demonstrates how to use the miniSASS App during the DWS Youth Summit at Bloubospruit in Johannesburg (2015).

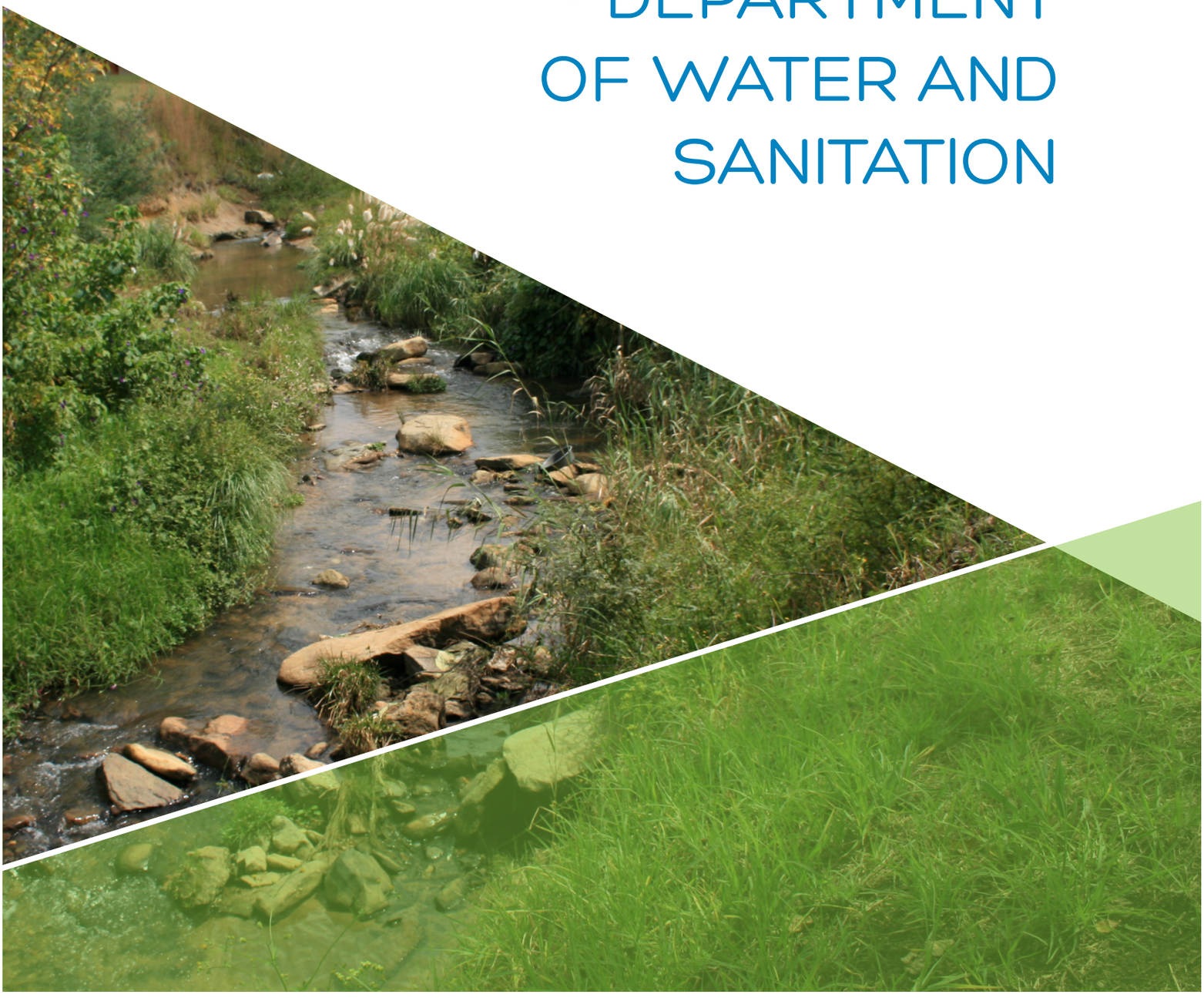
Visit www.wrc.org.za and www.minisass.org (dedicated website for miniSASS) for more details.

GROUPS	SENSITIVITY SCORE
Flat worms 	3
Worms 	2
Leeches 	2
Crabs or shrimps 	6
Stoneflies 	17
Minnow mayflies 	5
Other mayflies 	11
Damselflies 	4
Dragonflies 	6
Bugs or beetles 	5
Caddisflies (cased & uncased) 	9
True flies 	2
Snails 	4
TOTAL SCORE	
NUMBER OF GROUPS	
miniSASS Score (miniSASS Score = Total Score ÷ Number of groups)	

Remember to upload your miniSASS results on www.miniSASS.org

Ecological category (Condition)	River Category	
	Sandy River	Rocky River
NATURAL CONDITION (Unchanged/untouched – Blue)	> 6.9	> 7.2
GOOD CONDITION (Few modifications – Green)	5.9 to 6.8	6.2 to 7.2
FAIR CONDITITION (Some modifications – Orange)	5.4 to 5.8	5.7 to 6.1
POOR CONDITION (Lots of modifications – Red)	4.8 to 5.3	5.3 to 5.6
VERY POOR CONDITION (Critically modified – Purple)	< 4.8	< 5.3

CLEAR RIVERS CAMPAIGN CELEBRATING MANDELA MONTH - DEPARTMENT OF WATER AND SANITATION



The Department of Water and Sanitation's (DWS) Clear Rivers Campaign, held in different parts of the country, led to the clearing of 50 rivers in 2016. The campaign continues again in 2017, said Sputnik Ratau, spokesperson for the DWS.

"Rivers are the assets of a nation and water security is therefore critical for the country and its population. The Department has therefore adopted a premise that healthy rivers allow for a healthy nation," said the Department when the campaign was launched in 2016.

The ultimate goal of the campaign is to foster communities that are actively involved and engaged in the management of water resources in the country, as well as to help communities become water savvy and environmentally conscious.

Given that the country is also gripped by one of the worst droughts in decades, there has never been a more important time to remind South Africans that water does not originate from the tap and that clearing our freshwater ecosystems is a responsibility of everyone living in South Africa.

Through a collaborative effort, communities, departmental officials from regional and national offices, the private sector and other sectors of society have dedicated their time to cleaning the rivers and are engaged around the need to protect and efficiently use water resources. Some of the rivers cleaned included the Ngwanele River, Kuils River, Luvuvhu River, Siza River, Qumbu River, Molopo River, Orange River and the Moreleta River, to name but a few.

During Mandela Day celebrations in July 2016 Minister Nomvula Mokonyane cleaned the Jukskei River in Alexandra and the Deputy Minister Ms Pamela Tshwete paid tribute to former President Nelson Mandela by dedicating time to clean the Mzingwenya River, at Esikhawini in KwaZulu-Natal. This year, Minister Mokonyane will visit the Limpopo Province while Deputy Minister Tshwete pays a special visit to the Eastern Cape.

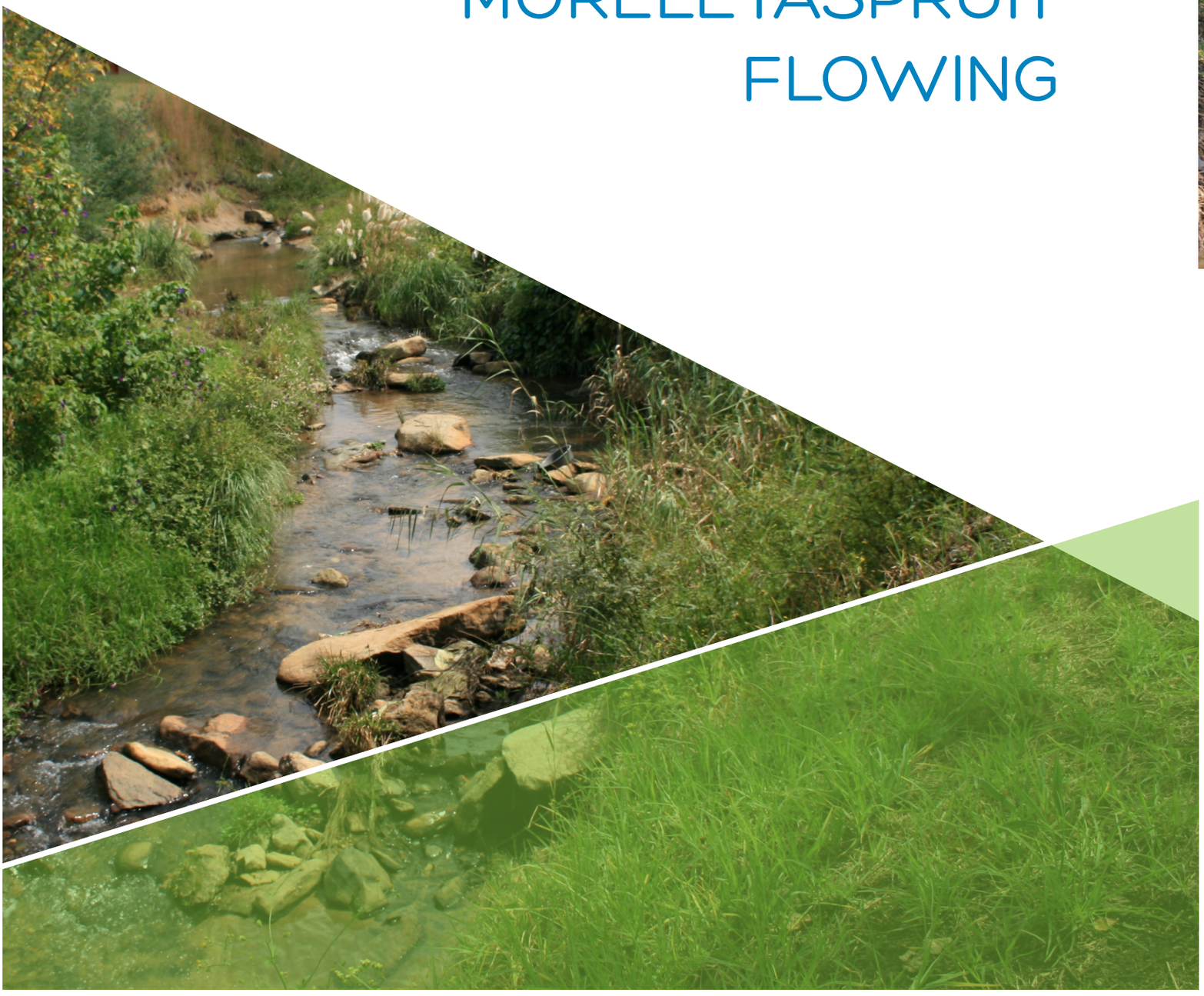
Rivers are the assets of a nation and water security is therefore critical for the country and its population. The Department has therefore adopted the premise that healthy rivers allow for a healthy nation.

The month-long campaign affords other citizens to join in and make a difference to the upkeep of the environment.

The department invites everyone to join the campaign using an enticing tagline "Others have already pledged their support through" #Wen`ulindeni.

Contact: Mr Sputnik Ratau
email: rataus@dws.gov.za

TSHWANE VOLUNTEER INTEREST GROUPS KEEP MORELETASPRUIT FLOWING



The Moreletaspruit has been under the watchful eye of concerned residents since 2010 when representatives from Friends Groups, City of Tshwane (CoT) Nature Conservation and other departments, adopted the stream with the support of the Department of Water and Sanitation (DWS). At the time of establishment of the Moreletaspruit Forum, these interest groups could not bear the perpetual destruction of the river banks in the Lynnwood area caused during the installation of the Moreleta outfall sewer. Recent activities within the catchment have kept the spruit alive and flowing.

Celebrating Water Month with partners

Anneli Kühn, Chairperson and co-founder of the Moreletaspruit Forum, Judy Scott-Goldman and Carol Martin, Friends of Moreletaspruit, recently partnered with the JNF Walter Sisulu Environmental Centre (WSEC) in Mamelodi and representatives from the DWS, WRC and Mamelodi Community groups: Umkariso Women in Water Co-operative, Community Colours, Clean City of Tshwane and Tshanduko, as well as councillors and others, for Water Month in March 2017. Many activities were planned and the month's programme culminated in a Walk for Water on 24 March. Water-wise pledges were drawn up.

Nico Sithole of Community Colours organised a workshop to encourage taxi and car-wash owners to be water-wise. He was assisted by Kealeboga Letlhaku of the WRC, Anneli Kühn and WSEC staff. Anneli spoke on the concept of water catchments, Dr Nonhlanhla Kalebaila of the WRC spoke about responsible water use and a representative from the DWS showed how to fix leaking pipes. Afterwards there was a practical session led by WSEC staff.

Involvement of schools

WSEC staff conducted workshops for the local schools and learners wrote about their concerns regarding water. These concerns were put into a memorandum to the Mayor to be read out at the event on 24 March. Eight children and one teacher from each of fourteen schools took part in the 'Walk for Water'.

In Moreletakloof, students from UNISA learnt about bird-ringing and did practical work on combating soil erosion and removing bug-weed. Girls from Hoërskool Waterkloof removed plants choking the dam. Jeannie also taught a group of Voortrekkers from Laerskool Constantiapark about rivers and litter pollution.

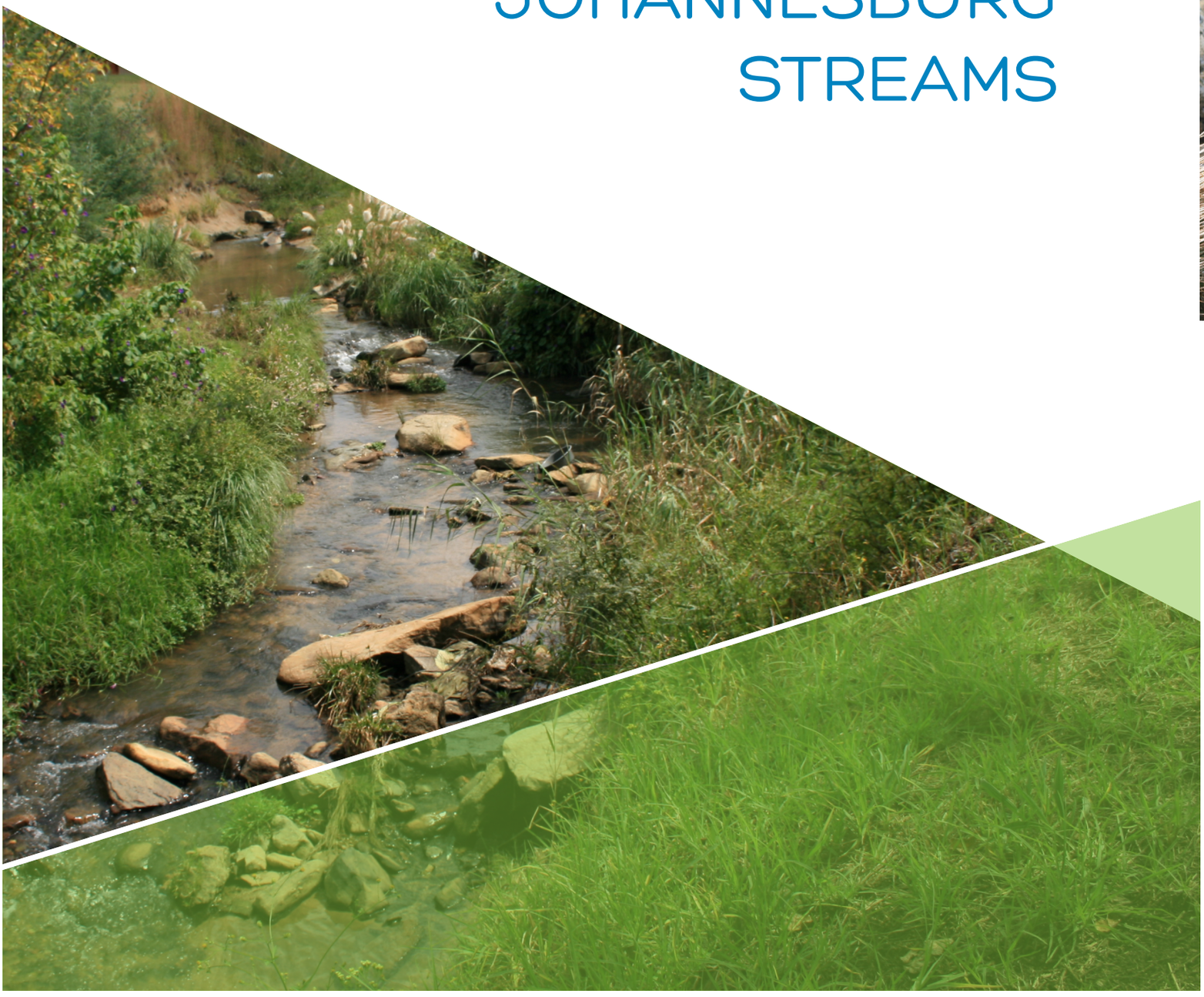
In Faerie Glen Nature Reserve the Friends hacked invasive alien vegetation, and had an insect walk which attracted many fascinated children.

Benefit of the Adopt-a-River Moreleta Spruit Programme

"With DWS support, CoT Nature Conservation, Friends groups and other interest groups working together under the Adopt-a-River Moreletaspruit banner the forum has a stronger voice to encourage residents, developers, golf courses, shopping centres, businesses, industries and farmers in the spruit's catchment area and along the river to adopt environmentally-friendly and water-friendly practices," comments Anneli. "We are also in a stronger position to attract funding for studies and projects. Training in all catchment management related issues are provided by the Adopt-a-River Forum to promote an understanding of integrated catchment management," adds Anneli.

For more information visit http://www.riv.co.za/ms/

EDENVALE RIVER WATCH - IRWIN JUCKES ACTIVELY GAURDING JOHANNESBURG STREAMS



Irwin Juckes is one of the known activists within the citizen science community of practice. His humility and dedication in the field of environmental services has earned him the respect of many citizen science groups. His work is mostly evident in the Johannesburg rivers.

Juckes has worked tirelessly to keep up-to-date water quality records within the tributaries in Edenvale, Bedfordview, Modderfontein and Johannesburg suburbs and the upper Jukskei River. His focus is on the Modderfontein Stream and the Edenvale Stream (also called Eastleighspruit), the Glendower Stream and the Oriel Stream.

Juckes's career began with a qualification in biochemistry and microbiology from the University of KwaZulu-Natal, and was later awarded a PhD by the University of Cape Town for his work on diseases of the Pine Emperor Moth Nudaurelia cytherea. He went on to obtain an MBA from the University of Cape Town Graduate School of Business.

Edenvale River Watch

Juckes has a passion for river health which has led to the establishment of the Edenvale River Watch. Edenvale River Watch uses official sources of water quality which are reported quarterly but are not always available. Edenvale River Watch may monitor water quality daily in streams where pollution is a frequent problem. Monitoring is of two types: immediate and long term.

Immediate monitoring is about water quality and pollution and recording what is seen by the naked eye, such as the visual assessment of clarity, colour, foam, appearance and smell.

"Anyone who can see the river can assess the pollution with no special equipment and without touching the water. It can be completed and uploaded into a permanent database with a data upload App on a smartphone within a couple of minutes", explains Juckes.

Longer-term trends require citizen science tools including turbidity measurements, bio-monitoring, flow measurements, habitat assessment and fixed-point photo monitoring.

The sewage spill in Bruma

Following the sewage spill that happened in April 2017 in Bruma, Irwin Juckes conducted an investigation, based upon which he compiled a report. The scope of his report was to monitor the impact of the April sewage spill on the river and its recovery.

Juckes used three measures of pollution to give a profile of this stretch of the river, and compared before, during and after the pollution event and the intervention. Juckes is very aware of how the pollution moves downstream and the changes that take place. The declining turbidity as the river flows shows the suspended material is aggregating and coming out of suspension, which causes problems further downstream where it accumulates.

The problems brought about by the sewage spill in Bruma started in the second week of April with residents in Morninghill questioning the smell in WhatsApp groups; later on it was posted on Facebook. There was confusion on how to report it (Morninghill is in Ekurhuleni and Bruma is

in Johannesburg). The local councillor made the first formal complaint on 23 April. Response teams fixed two other sewage leaks without finding the main spill in the Queens Wetland, which was only stopped on 3 May. By this time the accumulated impact was so great that Johannesburg Water appointed a contractor to do a clean-up, starting on 12 May. Since Irwin Juckes had already assessed pollution before, during and after the spill, he carried out a further assessment on 5 June to give a more complete view of the recovery. The river was extremely polluted and permanently so, due to the April spill and furthermore due to the pollution from the Johannesburg CBD.

Morninghill residents reported a bad smell in their area. Odours are not easily measured and they tend to be stronger later in the day, possibly because the water warms up and expels dissolved gases.

Edenvale River Watch intervention

Irwin Juckes is clearly a man who knows how to navigate his way in river monitoring techniques. Juckes says, "Edenvale River Watch monitors the rivers in three easy steps. Firstly, by setting up a pollution monitoring network." He furthermore emphasised that it's important to understand how to effectively report pollution events and get action in your particular area, usually from the relevant local authority. "Secondly, by recording the health of the river using the miniSASS bio-assessment method. This helps to show the impact of pollution or other human activity on the health of the river over the last few months," said Juckes. "Thirdly, by setting up fixed-point photo monitoring of places of interest or which are vulnerable. Also collecting useful information on your catchment helps such that it is available when it is needed. This includes previous environmental assessments, rainfall and peak flow records and newspaper records of floods," Juckes explains.

It is his sheer dedication, his commitment to the thoroughness of process and love of healthy rivers that truly makes him an unrivalled river health champion within the Johannesburg catchments.

Contact Edenvale River Watch
Email: ijuckes@isbroadband.co.za Phone: +27(83) 604 2493
Website: www.edenvaleriverwatch.co.za

Our April Eco-School ...

Matale Secondary School

Eco-Code
Be curious and explore nature and biodiversity!

Hello we are the Water Warriors of Matale Secondary School located in Phokeng in North West Province. We have a tributary of the Elands River close to our school which is part of the Crocodile River catchment area.

Action

Our Eco-Committee has been doing food gardening and waste related projects but we wanted to do an outing into nature. We were limited with time and transport but looking at our immediate community we realised that the environment is on our doorstep and we could have a look at what was offered nearby. Twenty-five learners in Grades 8 to 10 were involved in sampling the river which is about 1 km away from our school. The miniSASS (Stream Assessment Scoring System) was chosen to monitor the health of the river and measure the general quality of the water.

It uses the identification of macroinvertebrates living in the water which have variable levels of sensitivity to water pollution. Macroinvertebrates are small animals living among rocks, sediments and aquatic plants in streams, rivers and lakes. This activity was linked to our curriculum for Grade 8 Natural Sciences where learners need to know about biodiversity, indicator species and ecological dependence.

Results

The following tools were used: a net, a magnifying glass, gloves, a dichotomous identification key and a scoring sheet. We sampled a site behind the mall which was crossed by a road. We collected the following macroinvertebrates: leeches, crabs, shrimp, dragonfly larvae and water beetles. A score was given to each of the creatures found and we calculated that the river is in a moderately fair condition. We then entered the information on the miniSASS website so that the rest of the world can be able to view our results. Our results were shared in the school newsletter, we demonstrated the method to an Ethiopian researcher and were in the local newspaper.

Reflections

The miniSASS method was easy to understand and implement. It was an enjoyable learning experience we will never forget. After the floods of February 2017 we went to the river for the third time and discussed the impacts of urban growth. Stormwater from the roads contributed to a powerful flashflood which uprooted and moved large trees and rubbish including nappies which were trapped by the bridge.

WESSA
PEOPLE CARING FOR THE EARTH

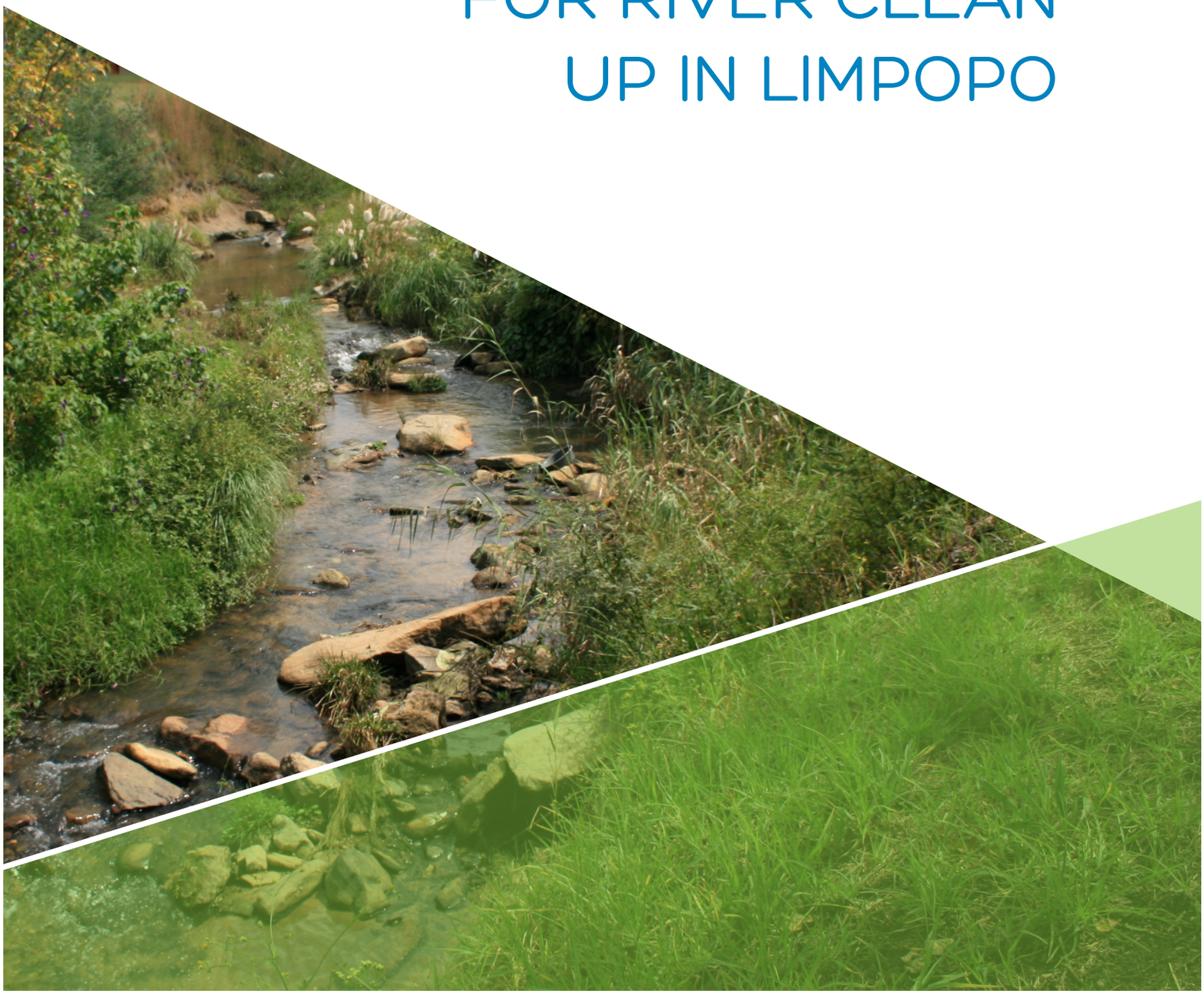
Eco-Schools

GroundTruth

miniSASS
STREAM ASSESSMENT SCORING SYSTEM

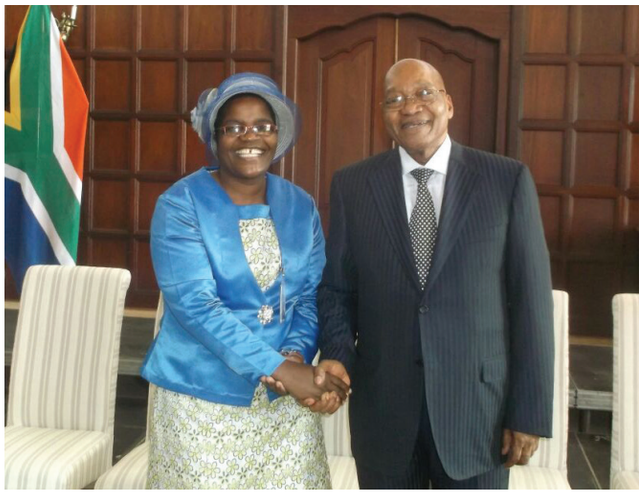
WATER RESEARCH COMMISSION

PFARELO RAMUGONDO AWARDED ORDER OF THE BAOBAB FOR RIVER CLEAN UP IN LIMPOPO



On 28 April 2017 President Jacob Zuma bestowed the 2017 National Orders on distinguished local citizens and eminent foreign nationals who have played a momentous role in building a free democratic South Africa and who also have made a significant impact on improving the lives of South Africans in various ways. The ceremony took place at the Sefako Makgatho Presidential Guest House in Pretoria and honoured Ms Pfarelo Rebecca for her outstanding contribution towards improving river health in her village in Limpopo.

The Order of the Baobab bestowed on Ramugondo recognises South African citizens who have contributed to community service, business and economy, science, medicine and technological innovation.



Rebecca Pfarelo Ramugondo with President Jacob Zuma

When our rivers are used as dumping sites, many people sit and watch while others prefer to act on this as they know water is a scarce resource. For some of our communities, local streams are their only source of drinking water. Ramulongo could not tolerate the continuous degrading of water quality of streams in her village.

Ramulongo is a true community builder. The 42-year-old hails from Ingenane Yak Ha-Manhole. She started a project to clean local rivers and streams after they were turned into dumping areas. The rivers they worked on were the only source of water for local communities. Ramulongo formed a group of young men and women to clean rivers and streams, called 'Tshikofokofo Adopt a River Project' with the aim of providing potable water.

"I started this project on 3 August 2010 with the aim of protecting water resources and the surrounding environment. I did this to avoid health problems, as domestic water should be free from harmful pathogens, chemicals and foreign objects," confirms Ramugondo.

In her village, there is no clean piped water supply and they rely mostly on unprotected springs. Ramugondo's objective was to conserve and protect water resources from pollution to ensure sustainable food security and human health in the surrounding areas of Ha-Makhuvha village.

"The project started with 100 people, 87 women and 13 men, mainly students from FET colleges. Many dropped out because of a lack of funds. However, they received support from the Department of Water and Sanitation, who trained them in waste management and firefighting. Vhembe District Municipality also helped them by collecting the garbage they collected from the river," says Ramugondo. She is one of those people who could not sit and watch the quality of water degrading in her village of Ngwenani Ya Ha-Mapholi in Limpopo.

This project has also encouraged other communities to start a similar project in areas such as Dwerani, Tshirole, Matangari, Tshidzivhe, Sheshe, Makonde, Mukula, Malavuwe, Luvuvhu and others.

The Baobab award is not the only recognition Ramulongo has received; it comes after three other awards from national, provincial and local government levels. Ramugondo says, "Our biggest concern now is people who continue polluting rivers and streams, because they think that we are being paid for doing this job."

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ABOUT WIN-SA

WIN-SA aims to capture the innovative work of people tackling real service delivery challenges. It also aims to stimulate learning and sharing around these challenges to support creative solutions. Most importantly, WIN-SA strengthens people to people learning. This document showcases best practice and lesson sharing. To comment, make addition and further input, please send an email to: info@win-sa.org.za

Our mission is to ensure that the body of knowledge in the water sector is well managed, readily accessible and applied, leading to improved decision making and performance especially of local government.

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WATER RESEARCH COMMISSION

WIN-SA
WATER INFORMATION NETWORK
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