

Headline: It's proven: business can save on water purification costs by integrating nature-based solutions

There is no doubt that drought experienced in most provinces across South Africa has changed livelihood in various ways, including business and environment itself. The scarcity of water, and indeed its value has been proven to be worth even more than fuel per litre: **NO WATER-NO LIFE!** Citizens, business and Government have an obligation to carefully managed this indispensable liquid called water in a unique way as the country tries to achieve aspirations carried in SDG:2030, Africa Agenda 2063 and indeed our own NDP: 2030! Besides the current crisis posed by drought, elsewhere in the country citizens experienced devastating floods in the last summer rainfall season. As if that is not enough, there is ever increasing levels of water resources pollution from various sources, affecting headwaters through to estuaries, including ground water!

Today, the 22nd of March 2018, the global community is celebrating the World Water Day. Central to the global message is that, there is one Earth with limited natural resources which are not expanding while populations and businesses are growing fast. This year's Theme is "Nature-Based Solutions for water security". The message is about encouraging people and businesses to be aware and take action against threats to our environment which in many cases are caused by our unsustainable land activities, such as deforestation, river pollution through irresponsible mining, excessive use of pesticides, fertilizers, dilapidating urban waste water purification infrastructure and many more. It is therefore possible that, collectively we can slow down or even reverse the environmental degradation. The unhealthy landscape (river catchments) conditions are worsened by climate change while slow implementation of mitigation and adaptation models simply increases socio-economic vulnerability with reduced chances of resilience.

Our water resources continue to be under serious pressure, in fact research points to being close to crisis conditions! Research has revealed that of 168 000km rivers length in South Africa, more than 80% are threatened with pollution. Of roughly 2400 wetlands mapped so far, more than 50% are seriously degraded, even lost their structure and functions, such as purification and filtration of water flowing through them. Similarly, of about 300 estuaries surrounding the country, more than 65% are highly polluted and degraded, a serious threat to their fish nursery function. About 61% of South Africa's land is moderate to highly degraded, posing serious threat to food security and facilitate soil erosion leading to dam siltation. Water resources and land are intricately connected, what happens on land is mirrored in our rivers, dams, wetlands and estuaries. Businesses, such as agriculture, industries, depend on assured supply of water quantity and of acceptable water quality for farming, operations and production. One of typical examples is the Dwars river catchment (355ha), Western Cape where the profitability of fruit production is affected by poor water quality (high filamentous algae concentration due to nutrient enrichment). Filamentous algae problem costs the fruit industry approximately R1.2m per year to purify irrigation water. These costs are inevitable passed to consumers, and this is felt mainly by the poor citizens. It is important to realize that rivers can self-purify themselves, which is a free service offered by these ecosystems. However, self-purification ability depends on the water resource health status vs consistency and concentration of pollutants delivered down. With increased pollution, the self-purification ability decreases, hence costly purification measures must kick in to sustain business! Communities, particularly those in rural areas where the majority of people rely on untreated raw water for livelihood incur costs of poor water quality.

Well vegetated land allows rainfall to infiltrate and resulting in recharge of ground water. This water continues to recharge wetlands and rivers, thereby delaying the impacts of drought as the rivers begin to lose water and dams dry up. Deforestation, especially where communities harvest trees for firewood, causes serious soil erosion and siltation. All these negative forces affect the quantity and quality of water directly affecting business and job creation. These dams also lose their recreational usage (sport), again affecting tourism and consequently, jobs. Tourism continues to attract many tourists into the country (South



Africa is the 3rd most diverse country in the world). Tourism industry directly contributed R102 billion to South African GDP in 2012, and supported 10.3% of jobs in the country. Kruger National Park can lose around 30% of its tourism revenue (estimated at R1billion per year) if all of its rivers were degraded. The practicality of this has been witnessed already with crocodile mortality in 2008/9 due to poor Olifants river water quality. The Duzi marathon is another case in point, where microbial pollution has reached alarming concentrations, way beyond the guidelines for recreational use! Many other water resources, especially dams such as Roodeplaat dam, Haarbeespoort and others are highly impacted (hypertrophic) due to nutrients transported through poor quality river water feeding these dams, thereby rendering them unfit for recreational purposes at huge revenue risks. Besides deteriorating water quality, there is an additional challenge posed by alien and invasive species, evaporating large amounts of water, while alien and invasive fish species threaten indigenous fish, hence the biodiversity.

The Water Research Commission (WRC) is deeply involved in generating knowledge in support of policy and communities, as well as business towards meeting the outlined growth frameworks. Various value add innovations are being explored within the green village and economy lighthouse (flagship) programme. Research has already demonstrated that rehabilitating a 125ha wetland at R1.7million can purify chemically polluted water and save on purification costs thereby adding more than R130 million to revenue. It is for this reason that businesses, such as insurance, industries, need to look at investing in environment as a risk mitigation measure to their businesses and partner with government and society in managing the environment. The landscape ecosystems (ecological and green infrastructures) must be healthy before they can render free services to business and society, such as the purification, infiltration, reduction of soil erosion, cultural, biodiversity, flood attenuation, carbon sequestration, aesthetic services and many more. Like engineering infrastructures, ecological/Green Infrastructures also need maintenance to be able to continue providing beneficial services to society and economy

While the Departments, such as Water and sanitation, Environmental Affairs, Agriculture Forestry and Fisheries are trying their best to protect our environment from further degradation, the magnitude of monitoring and managing our natural resources is huge and cannot be left in the hands of these departments, citizens and business have a huge role to play, the stewardship. Citizens and business must adopt and monitor stretches of rivers, dams, estuaries closer to their residential places using methods developed by the WRC. We must act now before it is too late to prevent further degradation of our water resources- Research shows!

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