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Catchments, communities and biodiversity

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Water is a precious resource that is essential for all life on Earth. As a water scarce country, South Africa needs to protect and manage its limited water resources in a manner that will benefit both people and the environment. With a rapidly growing population, emerging economy, and climate change challenges, it is imperative that a multi-pronged approach be adopted to manage water resources in the country. A multi-pronged approach encompasses social, ecological, and built infrastructure interventions that will improve water availability to communities whilst ensuring that the critical services provided by ecosystems are maintained.

These services include mitigation of drought and floods which cost the country billions of Rands and lead to individual hardship and loss of life. It has been estimated that the 2014-2015 drought cost the Western Cape economy R5-billion. Biological diversity plays a vital role in maintaining our ecosystems and water catchments by reducing erosion, keeping our wetlands healthy and mitigating the impacts of pollution, amongst other functions. Humans also depend on biodiversity for food, medicine, fibre, building materials, and economic opportunities that are generated through tourism, for instance.

The International Day for Biological Diversity is a United Nations sanctioned day that celebrates biological diversity on earth. Biodiversity is under threat globally with the rate of species loss higher than has ever been recorded before. Freshwater ecosystems globally are facing substantial threats. These ecosystems are important to biodiversity as they are home to about forty percent of fish species. To date, twenty percent of freshwater fish species are extinct. These ecosystems face various pressures such as over-extraction of water from rivers, pollution, overfishing and climate change. In South Africa, a similar narrative is at play with more than 90 percent of surface water being developed or altered in some way or another.

Catchment areas are described as regions that receive higher levels of rainfall compared to surrounding regions. These include mountain ranges such as the Drakensberg and Amathole Mountains. Catchments are important for biodiversity conservation, but they are not isolated from social pressures as they are home to a spectrum of communities and economic activities. It is essential that catchment management strategies have strong social components that complement the ecological objectives that have been set out for them. This is the multi-pronged holistic approach that puts communities at the centre of biodiversity conservation within catchments. By protecting catchments and their biodiversity, aquatic ecosystems are provided with the best chance to survive.

This International Day for Biological Diversity, the Endangered Wildlife Trust (EWT) recognises the importance of holistic stakeholder engagements in its catchment work. Through its community work, the EWT recognises that communities are custodians of catchment areas and ultimately, custodians of biodiversity in these areas. The EWT has demonstrated the multi-pronged approach through its projects in the Amathole (Eastern Cape Province) and Groot Marico (North West Province) catchments, as well as its partnerships in the Mzimvubu catchment in KwaZulu-Natal

The Amathole mountains are recognised as a strategic water source area. This region is inhabited by rural and peri-urban communities many of whom have limited economic opportunities. The Amathole Endangered Freshwater Species project, together with the Natural Resource Management Programme have leveraged on the youthful population in removing invasive alien plant and fish species along the Tyume River. These removals have been coupled with the monitoring of freshwater biodiversity and ecosystem integrity along the Tyume River and its riparian zones.

As part of this initiative, the EWT, together with the Department of Environment, Fisheries and Forestry (DEFF), cleared 1,250 hectares of Black Wattle stands. Black Wattle is a prominent invader and threat to biodiversity and water provision in South Africa. The species consumes a substantial amount of water, altering flow rates as well as aquatic and plant species composition. Black Wattle has no natural control agents in South Africa as it is indigenous to Australia. This makes it difficult to eliminate from ecosystems. Black Wattle poses a threat to water security from both a water quantity and a water quality perspective. Dense stands of Black Wattle growing along riparian areas of river systems can change the ecology of that river system. The shade results in water temperature and water chemistry changes which ultimately affects aquatic species composition. The changes in species composition along with the introduction of alien aquatic species such as rainbow trout can have devastating effects on aquatic biodiversity.

To counter the threat to the river system, the EWT implemented a comprehensive alien clearing and aquatic species monitoring programme. Indigenous species act as good indicators of aquatic health. It is essential for ecosystem functioning to protect indigenous aquatic species. Monitoring the ratio of indigenous fish species to invasive fish species, as well as stream health and stream flow also enables conservationists to gain insights on the effectiveness of the invasive alien plant clearing programme. The invasive alien plant clearing interventions have shown early signs of improvements in the population status of two endangered freshwater fish species, the Border Barb and the Eastern Cape Rocky. Ongoing monitoring is critical however, not only to monitor river health and the regrowth of Black Wattle, but also to monitor the Rainbow Trout population, which preys extensively on indigenous fish species.

Community groups were trained in ecological monitoring techniques such as the miniSASS aquatic monitoring protocol and Ecosystem Goods and Services protocol to strengthen the concept of improved ecological resilience within communities. These protocols equip communities to become citizen scientists. As citizen scientists, Tyume communities have gained insight into the dynamics of rangelands and aquatic ecosystems, as well as the need to maintain biological diversity.

As with the Border Barb and Eastern Cape Rocky, the Critically Endangered Amathole Toad is endemic, occurring only in the Amathole Catchment. The habitat of the Amathole Toad includes Amathole Montane Grassland and Amathole Mistbelt Grassland, which are endemic to the Eastern Cape and classified as 'Poorly Protected'. The site also supports Drakensberg-Amathole Afromontane Fynbos, which include patches of unique Fynbos that have not yet mapped been in the Amathole Mountains. The EWT is working with landowners in the region towards the formal protection of this habitat and its unique species, in turn securing water provision for the Eastern Cape.

To ensure that local communities also derive benefits from these conservation efforts and to contribute to the national imperatives of job creation and skills development, 150 contract workers were employed to clear Black Wattle. Five local entrepreneurs were trained and qualified as Natural Resource Management contractors, receiving training in computer skills, business management plant identification and basic rangeland management. They were then contracted by the EWT to carry out the invasive alien plant clearing work. Community members were also trained in health and safety, chainsaw operations, basic first aid and other life skills such as financial management.

A group of former contract workers received training in beekeeping to supplement their incomes into the future and to provide local consumers with a nourishing condiment. The Tyume Valley Beekeepers Association have had four harvests to date and are overcoming challenges such as drought and lack of access to fodder for the bees, as well as developing and strengthening market linkages with the support of some of their neighbours from Hogsback.

Working with local farmers, government partners and community groups, the EWT are also providing training on climate smart agriculture, soil erosion management, and improved animal husbandry for livestock. Climate smart agriculture enables farmers to adapt to drought, seasonal fluctuations and weather patterns, and mitigate risks to their incomes. In the Tyume valley, farmers identified improved husbandry as a critical need to build the resilience and production capacity of their herds. Climate Smart Agriculture coupled with improved animal husbandry and stronger links to agricultural extension services complements the conservation interventions being conducted in the Tyume valley, as they contribute to improved natural resource management.

By recognising community needs and sharing observations and experiences, it has been possible to develop strategic interventions to start working towards improved water and biodiversity management in the Amathole Catchment. This work cannot be implemented by one organisation alone. The initial phase has been supported by Rand Merchant Bank, members of the Amathole Catchment Forum, the Department of Water, Sanitation and Housing, DEFF, the Dept of Rural Development and Agrarian Reform, the Amathole Forestry Company and other partners. Going forward, we are confident that positive changes that have been implemented so far will provide a sound foundation for this work to be sustained and improved on, to the benefit of not only local communities but also downstream communities such as East London who depend on the Amathole Catchment area for their water provision.