

Projects Restoring Land and Water



With no vegetation to protect it soil is washed away and lands up in the canals and dams that make up the Tugela-Vaal water transfer scheme.

In a sleepy hollow in the foothills of the Drakensberg, in KwaZulu-Natal, local communities are not only learning to take care of their own land and water resources, but are also contributing to the protection of one of Gauteng's economic lifelines – the Tugela-Vaal water transfer scheme.

The communities of Mnweni and Okhombe form part of the Amangwane tribal authority in the northern Drakensberg area of KwaZulu-Natal. Situated between the formal conservation areas of Cathedral Peak and Royal Natal National Park the area is unique in that it is one of the few so-called 'high Berg' areas that are highly populated. Being part of the uThukela catchment it is also a crucial source of water to the country as a whole. One of the largest water transfer schemes in South Africa, the Tugela-Vaal, is situated here. This scheme provides valuable water to South Africa's economic hub, Gauteng, through a series of dams, canals and pipelines.

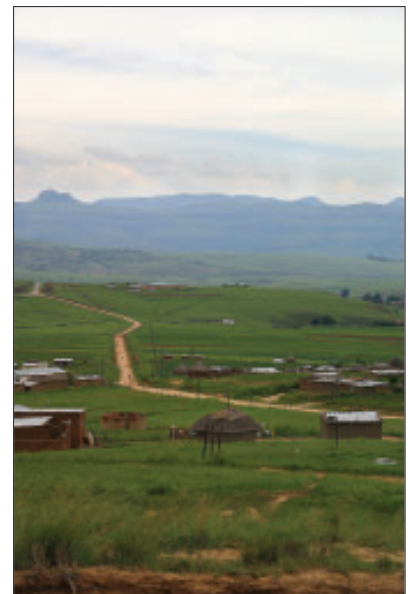
DEGRADED ENVIRONMENT

Scattered huts along the foothills of the majestic Drakensberg are home

to several thousand people who make a living from raising livestock and subsistence farming, with little to no access to basic services. However, years of overgrazing and inappropriate land management practices have degraded parts of the landscape.

Dr Terry Everson of the University of Natal in Pietermaritzburg has been involved in land rehabilitation projects in Mnweni and Okhombe for the last ten years. Her programme, supported by institutions such as the Farmer Support Group, CSIR, Department of Agriculture and KZN Wildlife, also aims to build capacity within the local communities to manage their land and water resources better.

Dr Everson explains that when livestock such as cattle and goats are



The Okhombe community forms part of the Amangwane tribal authority in the northern Drakensberg area of KwaZulu-Natal.

allowed to eat too much of the vegetation in an area the water does not infiltrate properly into the ground when it rains. This leads to increased water runoff and soil erosion. Huge dongas have already formed in the area.

“The most challenging aspect of this project is changing people’s mindsets.”

The communities do not only lose land that could be used for food production. Huge loads of silt also lands up in the rivers of the catchment and get washed into the dams that make up the Tugela-Vaal water transfer scheme, such as Woodstock Dam and Sterkfontein Dam. This silt not only reduces the capacity of the storage reservoirs, but is expensive to remove.

REHABILITATING THE LAND

“To restore some of these degraded sites we have trained people from the community in the implementation of a number of different erosion control techniques,” explains Dr Everson. This includes putting physical structures such as placing stone packs inside the dongas, stone lines, swales and cattle steps. Community members have also been assisted in planting vegetative structures such as vetiver grass planted on contour lines, trees planted in micro catchments and indigenous and exotic grasses planted on eroded slopes to improve water infiltration and reduce soil erosion.

Dr Everson’s team are not the only ones looking to restore the area to its former beauty. Rand Water has been involved in Mnweni since 1996. “At one stage, prior to the establishment of the Lesotho Highlands Water Project, Gauteng, which is our main supply area, was drawing 10% of its total bulk water supply from the Tugela-Vaal scheme. In addition,

MORE ABOUT THE TUGELA-VAAL WATER TRANSFER SCHEME



In the early 1960s it was determined that the capacity of the Vaal Dam would not be sufficient to cater for the water needs of Gauteng. This resulted in the development of the Tugela-Vaal scheme, which was completed in 1974.

With the construction of the transfer scheme, a certain amount of water from the Tugela River, which starts at Mont Aux Sources, in the Drakensberg, is transferred via canals, pipelines and dams into the Vaal River system.

The Tugela River flows into the Woodstock Dam and then into the Driel Barrage further downstream. A certain amount of water is pumped from the Driel Barrage into canals which then flow via gravity into the Kilburn Dam. Water from the Kilburn Dam is then pumped underground, over the Drakensberg and into the Driekloof Dam.

This section of the scheme is used to generate electricity. Eskom built a hydroelectric power station in the Drakensberg mountain called the Drakensberg Pumped Storage Scheme. When electricity is needed water is dropped from the Driekloof Dam, through hydroelectric turbines, and into the Kilburn Dam. Then in quiet periods the water is pumped back from the Kilburn Dam and into the Driekloof Dam.

When the Driekloof Dam is full water flows over a weir and into the Sterkfontein Dam where it is stored. Incidentally, when the Sterkfontein Dam was completed in 1986, it was the world’s second-largest earth wall and the largest without a spillway. The dam has a surface area of 67 km², an average depth of 93 m and a total storage capacity of 2,62 billion cubic metres.

When water is needed in the Vaal River system, water is released from the Sterkfontein Dam and into the Nuwejaarspruit, which then flows into the Wilge River and then into the Vaal Dam.

Source: Rand Water



Overgrazing and inappropriate agricultural practices have led to increased runoff and loss of soil, resulting in huge dongas in some areas of the catchment.



The Tugela River.

many of the communities here were relocated when the dams for the transfer schemes were built. Thus we feel an obligation to assist the communities in this area to improve land management and contribute to poverty alleviation and economic development," says Rand Water project manager Arul Moodley.

The Rand Water Mweni Trust was launched in 1999 as a joint effort between the water utility, the Wildlife and Environment Society of South Africa, Bergwatch and the communities of Amangwane. The trust was

established with an initial capital investment of R2-million from Rand Water. Apart from initiating revegetation plans that focused on the planting of vetiver grass, the trust also developed the Mweni Valley Cultural and Hiking Centre to promote ecotourism in the area.

Rand Water community relations manager Aubrey Nxumalo reports that training of community members in skills development workshops ranging from eco- and community-based tourism, conservation and visit management to mountain safety

procedures, guide training and the use of maps and the global positioning system have been undertaken. The project aims to increase sustainable employment opportunities in Mweni by 25% over the next five to ten years.

CASH BOOST

Another exciting development is that Rand Water launched a new project in the Mweni area in April. Aimed specifically at addressing land rehabilitation and introducing improved land management techniques at a large scale, the project will be undertaken over the next two years with initial funding of R5,5-million. Importantly, the project will not only aim to rehabilitate degraded pieces of land, but also proactively eliminate degradation by introducing new farming techniques. Education and training will be the main components of the new project.

"The most challenging aspect of this project is changing people's mindsets," explains Nxumalo. "People have been farming in the same way for hundreds of years. In a sense they have to be 'retaught' in new ways that will not only safeguard their environment, but improve their income."

To replace lost indigenous vegetation it is envisaged that an indigenous nursery will be established boosting economic development in the area. Another initiative is to replace the traditional ox-drawn sledge, which causes a lot of environmental damage, with a friendlier horse-drawn solution.

MONITORING AND EVALUATION

Do these rehabilitation initiatives really work? To monitor and evaluate the work that has been done on Okhombe the Water Research Commission is sponsoring a community-participative project

under leadership of Dr Everson. "To assess which techniques have been successful in reducing runoff and soil erosion, it is necessary to monitor and evaluate the project activities," she explains. "This will enable the communities to make decisions on technologies that are sustainable."

One of the aims of the project is to implement participatory monitoring whereby the rural participants record and analyse differences and change. A total of 17 community members, who now form the Okhombe Monitoring Group (OMG), have been trained in assessing the rehabilitation techniques. Simple techniques are used to monitor soil erosion. Each technique is used on an eroded and rehabilitated site so that the two can be compared. For example, basal cover is determined using a square metre quadrant subdivided into 25 squares. A Morgan splash cup measures up- and down-slope erosion, while splash boards are used to measure the height of 'splash' when it rains.



Weirs are one of the monitoring techniques used by the Okhombe Monitoring Group.

In each sub-ward rainfall is measured with rain gauges. Donga profiles are measured to determine sediment deposited in the dongas. In addition, square metre run-off plots have been installed and water quality and quantity is measured from the runoff collected in two-litre bottles. All the monitoring sites have been fenced off to keep livestock out.

According to Dr Everson, the use of these techniques allows the communities themselves to determine the effectiveness of the different rehabilitation techniques on runoff and soil loss. "This provides an opportunity for learning where the people contribute to the monitoring process and are empowered to take subsequent decisions." 

A member of the Okhombe Monitoring Group explains the monitoring techniques used to evaluate rehabilitation techniques to a group of visitors.

