

CATCHMENT MANAGEMENT

Local communities in the uThukela Catchment, in KwaZulu-Natal, are participating in programmes to halt erosion and rehabilitate degraded areas of the catchment.

Rehabilitating Degraded Catchments

The uThukela Catchment

The uThukela Catchment area plays a vital role in water provision for KwaZulu-Natal and Gauteng. Furthermore, the communities that live in the mountainous areas of the catchment rely greatly on the local natural resources, which are their only productive asset.

The past lack of effective management within these areas has had negative impacts on the natural resources. Loss of grass cover on mountain slopes has resulted in poor water infiltration, increased runoff, as well as severe soil erosion and has reduced opportunities for crop and livestock production. Excessive quantities of silt end up in rivers and the storage dams that make up the Thukela-Vaal water transfer scheme.

Communities and conservation

The government, through the National LandCare programme, has taken the initiative in involving local communities in conservation. A pilot LandCare project was initiated at Okhombe with the focus on capacity building and training of community members in the implementation of different erosion control techniques.

LandCare views land degradation as a community problem and requires that people work in groups to encourage land users to assume responsibility for local problems. While the LandCare project as a whole has enjoyed a large measure of success, it was initially not possible to assess the impact of the different erosion control measures because of a lack of quantitative information.

This shortcoming stimulated the piloting of a community-based monitoring system with funding from the WRC for establishing the effect of rehabilitation measures on the reduction of soil erosion and of runoff, as well as on enhancement of water quantity and vegetation cover in formerly degraded areas.

It was important, at the outset, to develop institutional capacity within the community to participate in the

development of the pilot monitoring project. The Okhombe Monitoring Group (OMG), comprising 24 representatives from the six sub-wards within Okhombe, was consequently formed. The OMG has taken the responsibility for developing and implementing rehabilitation and monitoring programmes for Okhombe.

The concept of monitoring impacts of rehabilitation measures, incorporating the use of appropriate indicators, was introduced to the community during a participatory workshop held at Okhombe. This was followed by a number of participatory workshops with the OMG, during which particular objectives and indicators of land rehabilitation were developed specifically for the Okhombe catchment. This enabled the OMG to assess the extent and severity of soil erosion in the different sub-wards and draw up appropriate plans of action.

The main impacts of erosion are perceived by communities to be a great reduction in availability of land for agriculture and for grazing, followed by the encroachment of dongas on homesteads and community gardens, thus hindering access to schools, halls, stores etc. Communities further attribute erosion to practices such as a lack of control over livestock movement, moulding of bricks, incorrect tillage practices and so forth. Whereas all communities are aware of the soil erosion problem, only those who have received training have the skills and motivation to address it.

Training the community

The community has been trained in a number of different erosion control techniques. These include the use of physical structures (such as stone packs, stone lines, swales and cattle steps) and vegetative structures such as vetiver grass planted on contour lines, trees planted in micro-catchments and indigenous and exotic grasses planted on eroded slopes.

The main focus, however, has been on training in support of the community-based monitoring system to be implemented by the OMG, many of whom have had little formal education. To be acceptable, monitoring techniques need

to be easily communicated to members of the community, the equipment used needs to be robust and of low cost and interpretation of monitoring results needs to be straightforward, requiring minimal data manipulation prior to final presentation.

A selection of monitoring techniques fulfilling the above requirements was implemented on an eroded site and a rehabilitated site to test their usefulness in detecting changes due to rehabilitation.

Monitoring techniques tested in this way included:

- **Splash board:** In bare areas greater heights of rain splash were recorded compared to areas that have good vegetative cover.
- **Morgan splash cup:** In highly eroded areas the mass of sediment trapped was substantially larger than for less eroded areas; decreasing amounts of sediment were collected in areas that were experiencing increases in vegetative cover.
- **Donga profile technique:** This indicated considerable change in shape and sediment deposit following the building of stone packs.
- **Plant basal cover:** Coverage of soil by vegetation increased from 55% to 71% in the rehabilitated site, but decreased in the eroded site from 33% to 24%.
- **Runoff plots:** The water collected from the rehabilitated site was clearly cleaner and lower in quantity than on the eroded site.
- **Gauging weirs:** These provided measurements of runoff from catchments.

In addition to collecting data, the OMG received training in data analysis, interpretation and presentation. Acquired skills included the entering of data on MS-Excel spreadsheets and preparation of graphs. These graphs have been used in presentations to the traditional administrative council, community meetings, school groups and local and international visitors to illustrate how effective the rehabilitation of the severely eroded areas of Okhombe had been.

The development and implementation of the community-based monitoring programme was an ongoing process throughout the five years of the pilot project. Modifications to the techniques and data sheets were continually made by the community during this period. The two techniques most favoured by the OMG proved to be the splash board and runoff plots because they are easily understood, have a high visual impact and produce data that are readily recorded.

Midway into the project, a new rehabilitation site at Mpameni was incorporated to broaden the monitoring programme from site level to small catchment level. This catchment programme involved monitoring streamflow from two contrasting catchments (a grazed catchment versus

an eroded one in the process of being rehabilitated). At the time of project conclusion, it was still too early for the effects of rehabilitation to show any clear effect on low flows. The premature termination of monitoring is of concern, since the long-term effects of rehabilitation on streamflow need to be addressed.

The education and training processes put into operation were both scientific and social, bringing people together and contributing to the development of the community as a whole. From the start of the project the community was involved in decision making on topics ranging from short-term planning (e.g. scheduling of meetings) to complex issues (e.g. development of land use management plans and selecting work teams). This involvement contributed to the community taking ownership of the project.

Developed capacity in environmental management

The monitoring results indicate that the rehabilitation undertaken by the community brought about a significant decrease in both soil loss and runoff. Work teams have developed the capacity to evaluate each situation and apply the most appropriate of the monitoring techniques.

The people of the Okhombe community have been empowered to take the initiative in environmental management of their area. Accepting responsibility for their natural resources is a crucial step in the move towards effective catchment management.

Further capacity building in computer literacy and data analysis is desirable to enable the OMG to develop interdependence and the ability to work on their own. It will also enable them to transfer their scientific skills to neighbouring communities that face similar problems.

Efforts to improve the livelihoods of people that focus only on land rehabilitation, address the symptoms rather than the main cause of erosion, which is overgrazing. The overgrazing issue is, therefore, also receiving attention from the Okhombe community, who have recently implemented a rotational grazing system to increase vegetation basal cover and grass production.

Further reading:

Community-based Research on the Influence of Rehabilitation Techniques on the Management of Degraded Catchments, (Report No: 1316/1/07).

To order this report contact Publications at
Tel: (012) 330-0340; Fax: (012) 331-2565; E-mail:
orders@wrc.org.za