

Degraded rangeland: can the balance be restored in the absence of satisfactory range management practices?

F.J. Mitchell, R.G. Bennett, B.D. Forbes and R.N. Reynolds

*Dept of Agriculture and Environmental Affairs, Private Bag X9059, Pietermaritzburg, 3200, South Africa,
Email: mitchellf@dae.kzntl.gov.za*

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Introduction The rangelands of KwaZulu-Natal play a fundamental role in the wealth and security of communal populations who are dependent on these forage-producing lands for their livelihoods. In most communal areas of the Province, there is an absence of satisfactory range management practices and the utilization of resources is generally non-sustainable. A major threat to the productivity of rangeland is inappropriate land use, such as overgrazing and incorrect burning practices, leading to extensive degradation of both the vegetative and soil components. Range vegetation and soil reserves show vastly reduced productivity. Degradation also results in increased susceptibility to erosion, loss of vegetative cover and palatable species, loss of biodiversity and reduced productivity, directly threatening food security of vast numbers of people in the rural areas. Social issues such as weakened and marginalized traditional authorities and reduced control of resource utilization is partly responsible. In addition, the value placed on livestock for draught power, meat, milk and other products, and for financial security against calamity, entrenches a reluctance to diminish stock numbers. Alternative strategies to reduce pressure on stressed range systems need to be formulated in participation with affected communities to, among other benefits, increase the contribution from animals to household security.

Materials and methods Three case studies are assessed to determine the impact of a lack of satisfactory range management on rangeland productivity, species change and soil erosion. Field studies and remote sensing data were utilized to identify the nature and extent of degradation, current land use practices and opportunities to close the gap between potential production and current land use. A predictive tool to pre-empt degradation in agro-ecological zones of the Province was developed.

Results Degradation patterns assessed from long term conservation and communally managed research areas identified ecosystems which are so fragile that rehabilitation is uneconomical, particularly when the pressure on the system cannot be reduced. A fifty year research study has provided valuable information on the ability of various soil types to recover after severe mismanagement. The study indicates an increase in tree density from 477 trees/ha to 6266 trees/ha over 23 years on shales with erosion still active, while palatable grasses have increased to 120% of benchmark on dolerite sites. A technological package has been developed that can be used on farms of all sizes, with a participatory approach ensuring the transfer of technology, mentorship and integrated natural resource management systems ensuring success. Alternative strategies encompassing cover cropping, improved maize production for residue availability, organic manures, improved animal health, planted pastures for soil conservation and grazing, alley cropping and water harvesting have been identified within the community-driven approach. One communal study area was severely overgrazed, with stock losses every winter due to lack of fodder. Subsequent to intervention strategies, maize yields improved from <1 ton per hectare (t/ha) to 5.8 t/ha, planted area increased from 8 ha to 130 ha, providing greater household food security and providing additional residue for over-wintering cattle. Farmers' resource management skills and the adoption of sustainable agronomic practices was evident. Marketing and on-farm value adding opportunities were instituted. Animal deaths were reduced by more than 50%, livestock sales were encouraged and 54 jobs were created within the community directly attributed to improved agricultural productivity.

Conclusions To protect soil, water and vegetation and to achieve sustainable utilization of resources, traditional carrying capacity and grazing pressure ideologies need to be replaced by alternative, integrated strategies which are community driven to ensure adoption of sustainable resource management techniques. A food-feed system which increases the yield of food crops, sustains or increases soil fertility and provides improved fodder from residues is essential for communal systems, particularly in marginal areas where degradation erodes food security and where reduction of stock numbers is culturally sensitive.

References

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