

Indigenous Seed Harvesting and Rangeland Restoration



USAID/IUCN Programme on Applying Ecosystem Approach in the Orange-Senqu Basin



BACKGROUND

Large areas of grassland in Lesotho have become degraded over time due to inappropriate grazing and livestock management. In addition, over-zealous cultivation of marginal lands has led to large areas of cultivated land being abandoned and no longer planted to crops. These abandoned lands do not recover to resemble natural grassland, both in terms of species composition or productivity. The species composition remains poor, with low diversity, species richness and cover. These old lands are frequently the primary sites for the start of erosion.

Restoration efforts in Lesotho have been commonly focused on physical rehabilitation works and in some areas, reseeded with commercially available seed.



The current re-seeding efforts have generally focused on the use of the grass *Eragrostis curvula*. This is an indigenous grass, which does occur naturally in the area. *Eragrostis curvula* seed is available commercially and in large quantities. However, this is seed that has been collected in various parts of South Africa, and bred for particular traits like productivity and palatability so that it can be used as a pasture grass in commercial agriculture. This means that the *Eragrostis curvula* seed purchased is unlikely to be similar to the local varieties, and may be less well adapted to the local (cold) environment with its short growing season and long cold period. In addition, *Eragrostis curvula* is not very palatable, unless fertilized with nitrogen fertilizer in particular, as it is usually when grown as a pasture grass. In natural veld, it is usually not a preferred grass. It has been used as rehabilitation species in the Cathedral Peak region of the KZN Drakensberg, with some success from a soil stabilization perspective. However, where it has been successfully established it dominates as a near mono-specific stand for decades. Research results indicate that a pure stand of *Eragrostis curvula* resists invasion by other species. This could be viewed positively if that is the desired state, or negatively if the desired state was a greater level of species diversity.

Currently, there is not much alternative, because of a lack of locally adapted grass seed available. So, the use of *Eragrostis curvula* as a re-seeding species is positive from a soil stabilization perspective, but is not the best option from a biodiversity option and arguably not the best option for livestock production.



There is a possibility of using indigenous grass species for re-seeding. This has been done successfully in other parts of the world in various rehabilitation efforts. The most common examples of success are from the US prairie grasslands, where there have been successful native species reseeded efforts for decades. There has been some success in South Africa, with promising results on the restoration of open cast mines. There are several advantages, some problems and some opportunities with such an approach.

THE ADVANTAGES

- The local species are adapted to the local environment;
- Several species can be established, which is desirable from a biodiversity perspective;
- A diverse range of species is likely to offer greater soil protection than a single species;
- A diverse range of species is likely to lead to better livestock production than a single species (such as *Eragrostis curvula*); and
- It could open up significant opportunities for training and developing local expertise, with the potential of developing small-scale entrepreneurial opportunities.

THE PROBLEMS

- Indigenous grass seeds are difficult to harvest, store and plant and the whole process would have to involve careful management to improve the success rate;
- Indigenous grass seeds are often slow to germinate and establish;
- There is currently no source of indigenous grass seed available, other than "improved" pasture species such as *Eragrostis curvula* and a few others; and
- There would be a requirement for specific expertise.

OPPORTUNITIES

- The development of local expertise;
- The development of small business opportunities;
- The improvement of grazing potential, biodiversity and soil stability; and
- The generation of interest and funding from a range of potential funders, because such a project could potentially generate widespread interest if successful.

Such an approach, if adopted, would take time to develop and implement, and would not replace the current seeding with *Eragrostis curvula*, but could rather complement it. In the current project, areas of grassland are due to be rested for up to 3 years to allow for recovery of the grassland. These rested areas should produce reasonable amounts of seed of a variety of grass species, which could be harvested, dried, stored and planted on trial sites, preferably old abandoned crop lands.

Such an approach would be ambitious, and if successful, could become a high profile conservation flagship, putting communities at the forefront of conservation, while looking after livelihoods.

AIMS

Ecological, environmental and agricultural

- Restore biodiversity,
- Reduces soil erosion,
- Improve livestock production potential.

Community

- Involve local communities in restoration of degraded areas,
- Develop unique expertise among local communities,
- Develop potential business opportunities.



DEVELOPMENT OF PLAN

Grasses usually flower from December through to February/March, with different grasses flowering at different times of the season. Grazing animals have to be excluded from the area to be harvested, to ensure that all palatable species produce seed. The process of flowering involves:

- Development of flower,
- Pollination,
- Development of seed,
- Ripening of seed,
- Seed fall.

The process of the development and ripening of seed has to be monitored carefully to ensure that seed is harvested at the right time. Once the seed is ripe, it can be harvested in a number of ways on a small scale:

- Using gloves, the seed can be plucked from each inflorescence and placed in a suitable bag.
- Flowering stems can be cut using a sickle or other suitable blade and collected.

Once the seed is harvested, either by plucking seed or cutting whole inflorescences, it must be dried as soon as possible to prevent it from going moldy. The most suitable way of drying it is to lay it out on a sheet of plastic in a well ventilated room. The seed should be turned over several times a day for several days until it is dry. Then it can be placed in suitable bags for storage until the beginning of the next growing season. This storage time helps to break the dormancy that is experienced by seed of some species of grass, and also allows for planting at the beginning of the next growing season to give the new seedlings as much time as possible to grow before the onset of winter. Planting can be done by hand, using established techniques used by most farmers.





The most critical stages in the process are:

- Harvesting seed at the correct time,
- Ensuring that the seed is dried adequately,
- Maintaining suitable storage conditions, namely cool and dry,
- Planting at the right time of the season.

Germination and emergence is usually slow and erratic compared to agricultural crops, but experience has shown that germination percentages are reasonable, and that reasonable cover can be achieved, with reasonable levels of diversity.

This approach has not been evaluated in Lesotho, and would need to be tried experimentally to evaluate its potential, develop local expertise and to adapt approaches for local conditions.

A phased approach may be the best way of initiating the process. Phase one should include working with a community on a site to go through the process outlined above from identifying a suitable site, through exclusion of animals, identifying and harvesting seed, drying and storing seed to planting and managing a test site.



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A Sesotho version of this booklet is also available – for a copy please contact:
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