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## REGENERATING RANGELANDS IN EASTERN MOROCCO

A rangeland rehabilitation project in eastern Morocco has increased fodder availability by seven times over a 9000 hectare area – while restoring biodiversity and reducing soil erosion

This project, co-funded by the Global Environment Facility, has successfully rehabilitated over 9000 hectares of degraded rangeland in eight rural communes on the high plateau of eastern Morocco since 2006. Much of this land had been abandoned by pastoralists as it produced too little forage to support their livestock. Some 21 pastoral cooperatives with more than 900 members have benefited from the project to date.



Pastoralists seeding furrows on newly prepared rangeland. Use of indigenous range species helps restore natural biodiversity and promotes sustainability.

*Source: "pictures from project managers"*

### Points to Consider

- A recognized and functioning governance mechanism, such as a cooperative or traditional institution, is essential to ensure the restored range is sustainably managed.
- A strong business case—financial or political—is needed to acquire the funds needed to set up the operation.
- Local communities will need to be trained in seed collection and production to support range regeneration.

### Purpose

This brief is intended to inform potential beneficiaries, development and extension agencies (including nongovernmental organizations), and decision-makers and planners of the availability of this successful innovation for rehabilitating large areas of rangeland in dry areas.

### Suitability

This approach is suited to degraded rangeland areas on a wide range of soil types with slopes of up to 12%. It does, however, depend on effective governance mechanisms being in place to manage the utilization of the rehabilitated rangelands.

### The project in numbers

- 9200 hectares rehabilitated
- Livestock carrying capacity increased sevenfold
- Over 900 beneficiaries in 21 pastoral cooperatives
- US\$1.3 million – total cost
- US\$140 – cost per hectare

### Partners

- The High Commission on Water and Forests and for Efforts to Combat Desertification
- Ministry of Agriculture and Marine Fisheries
- United Nations Industrial Development Organization (UNIDO)
- Pastoral cooperatives

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Restored range. The area in the foreground is unrestored.

Source: "pictures from project managers"

Some 70% of the land in eastern Morocco is used collectively by local communities, largely for extensive grazing. But large areas have been stripped of their vegetation, and wind and water erosion are widespread. Key rangeland species are being lost, including *Artemisia herba-alba*, a shrub that is one of the most palatable range species and a major part of the diet of sheep and goats in the region, and alphagrass (*Stipa tenacissima*), a perennial grass species that is highly drought tolerant.

The project used a special plow pulled by a powerful tractor to carve furrows 50 cm wide and 40 cm deep along the contours of gently sloping land. Gaps are left in the furrows every 200 meters to facilitate the free movement of grazing animals. Stone bunds have been built across streambeds to reduce flow and erosion and increase infiltration of water into the soil. The furrows trap rainfall, run-off water, and drifting soil to create microenvironments that encourage the re-establishment of the rangeland plants. This process is helped along by the pastoralists, who collect seed of desirable local rangeland species and scatter them in the furrows. Shrubs, including saltbush (*Atriplex nummularia*) and artemisia (*Artemisia herba-alba*), are also planted in the furrows to provide additional, high-quality feed during the dry season. Artemisia, a characteristic plant of the zone, is one of the reasons why the region is so well known as a source of high-quality livestock, highly sought after in the market in Morocco.

Preparing the land in this way is not cheap—preparing 9200 hectares cost nearly US\$1.3 million, a cost of roughly US\$140 per hectare—but the costs are lower than alternative approaches such as seeding the range, and the returns are high. Fodder production has increased sevenfold. The earthworks are long lasting—some of the furrows were made nearly ten years ago and are still collecting seasonal rainfall and sustaining forage crop growth, year after year. At this scale the cost per hectare becomes

very affordable—spread over ten years, it is less than the price of single sheep slaughtered each year.

The intervention has increased live-stock production from the rangeland, increasing pastoralists' income, and restored formerly abandoned land to productive use. Soil condition and fertility have improved, a wide range of indigenous plant species has been restored, and animal biodiversity is increasing.

The cooperatives were keen to support this rangeland rehabilitation effort following earlier demonstration trials done on relatively small areas, i.e. 100 hectares. They have adopted grazing management practices aimed at ensuring the sustainable utilization of the range, foremost among which is avoiding grazing the herbage until after it has set and dropped its seed. They have also actively engaged in gathering seed of their preferred species and are working with the project to establish plots that they manage for seed production and harvesting.



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