

A Successful New Approach to Improving Livelihoods in Degraded East African Highlands

Integrating sustainable land use with biodiversity conservation

Between 1992 and 1995, under the former SEE program, and with funding from Norwegian People's Aid, an innovative land restoration trial was carried out in three Eritrean villages which aimed to expand local people's livelihood options in degraded East African highlands. In 2014, with funding from the Drylands Coordination Group, *Mind the Gap Research and Training* undertook an evaluation that examined the impact of this initiative 20 years later. Evaluation results were overwhelmingly positive, showing that it is possible to restore heavily degraded land with highly prized native trees while simultaneously improving local lives with fast growing trees and wood supply. The results have also provided the basis for a multinational effort to scale up the results, and provide valuable lessons for other reforestation efforts taking place today.

Rehabilitating degraded land significantly enhanced livelihood opportunities and land use options

The species in question were the native olive and juniper trees that had once covered much of the rolling highlands of Eritrea, but by 1991 had become highly degraded or completely barren. In close collaboration with the local communities, two government ministries, and Norwegian SSE members, nearly 250,000 seedlings were grown in seven nurseries, and approaches were agreed upon to establish and protect eight core experiments in three villages. The seedlings were planted on sites where just rock remained, prospects for agriculture were non-existent, and all hope for restoration had been abandoned.

Without the protection of highland forests, ecosystems and livelihoods collapse

African mountain forests are the key to protecting the ecosystems, soils, and water systems at lower elevations. They further serve as a valuable source of livelihood security for their communities, both locally and in the lowlands below. Without these mountain forests:

- Soils erode at catastrophic rates,
- Water is not stored but runs away down the hillside causing further damage,
- Agriculture declines,
- Livelihoods are lost, and
- Entire ecosystems collapse.

In terms of global conservation and climate change challenges, African mountain forests compare in world importance to rainforests, critical estuaries and coral reef systems. No trees on mountain tops - no tea or coffee below. No trees along the tops of high hills, no primates, elephants or threatened wildlife below. No trees on top, ruined agriculture and impoverished livelihoods below.

RESULTS

Local people and central government have formed a 'hands on' partnership to overcome all barriers to rehabilitating highly eroded badlands

1. The evaluation showed that land restoration after 20 years was so successful in all three villages that:
 - Wood supply was increased.
 - Highly valued native trees were re-established and are growing well.
 - Grazing quality was greatly improved.
 - Agro-forestry, improved grazing options, and other opportunities for livelihood security have been created.
 - Bird life and biodiversity in general have been enhanced.

These improvements enhanced the livelihood security for the people in all three communities. So much so, that they themselves want to protect these areas, and scale up the work to other degraded lands and neighbouring villages. The government wishes to support this.

2. Other African experts have now requested international cooperation on conserving and restoring these woodlands throughout east and southern Africa.
3. From a technical perspective:
 - It is possible to reforest heavily degraded lands using native olive and juniper. Survival of olive and juniper plants after 21 years was 80-90%. Growth rates of 25cm per year for olive and 40cm per year for juniper are achievable. Tree crowns are touching each other at some sites, lowering temperatures and increasing biodiversity beneath the tree canopy.
 - Grasses and herbs have successfully colonised the land under the trees, compared to adjacent untreated, grazed hills.
 - Olive and juniper trees survived even on the rockiest, driest and most challenging areas we worked with in 1992-3.
 - Eucalyptus did not retard the growth of native plants growing under its canopy.

LESSONS LEARNED

A network for scaling up across east and southern Africa has been created. Protection, imagination, and partnership work in local contexts are critical next steps.

1. ***The technical obstacles to restoration on these barren sites have largely been overcome.*** The techniques used here should transfer relatively easily and cheaply.
2. ***Social and political obstacles remain and these vary according to local and national context.*** Even on the driest, rockiest areas, most trees survived. However, the two key reasons for limited olive growth were social: opportunistic snapping of branches for toothbrushes, and grazing.
3. ***The results can be transferred to other African countries and a network of experts is ready to collaborate.*** African experts discussed this work at a DCG-funded conference in Oslo late 2014. They also reported on the status of African mountain forests across east and southern Africa. In Kenya and Tanzania, mountain forests are being lost due to politically and socially driven incentives for expanding agricultural land use – even where short-term gain means

undermining long-term sustainable land use. Results from Eritrea are relevant elsewhere in Africa and can support wider efforts.

NEXT STEPS

- 1. International recognition and funding obstacles remain.** Further publicity needs to be undertaken to galvanise the international community to action, by considering (a) the consequences of losing African Mountain Forests and (b) the opportunities for food security, livelihoods, climate change, biodiversity and sustainable land use by conserving and restoring them.
- 2. The work has inspired international interest and further concrete proposals for scaling up.** At a DCG-hosted international conference in Oslo, November 2014, a number of senior African and Norwegian experts on African Highland Forests presented papers on the status of and opportunities for these forests. Eritrean and Ethiopian officials collaborated to send people to the conference and a door has been opened, through this work, to extend collaboration in a positive way. All conference delegates gave positive feedback on the work, and are enthusiastic to extend it and build concrete collaborations.

COST

- NORAD / NPA contributed about \$200,000 in two grants between 1991 and 1995.
- Communities contributed long –term hospitality, several hectares of land and significant amounts of time.
- The Eritrean Ministry of Agriculture and local administrations contributed significant time and other resources such as nursery space, community venues, skilled labour, seeds, authorisations and access.

ADDITIONAL SOURCES

- **Birdlife International. (2012).** Ecosystem Profile: Eastern Afromontane Biodiversity Hotspot. *Critical Ecosystem Partnership Fund*.
- **Chazdon, R. L. (2008).** Beyond deforestation: restoring forests and ecosystem services on degraded lands. *Science* 320(5882): 1458-1460.
- **Fisher, B., & Christopher, T. (2007).** Poverty and biodiversity: measuring the overlap of human poverty and the biodiversity hotspots. *Ecological Economics* 62(1): 93-101.
- **Jones, S. (1991a).** Archaeological and Environmental Observations in Rora Habab, Eritrea. *Azania* XXVI, 5-11.
- **Jones, S. (1991b).** Environment and Development in Eritrea. *Africa Today*, 38(2):55-60.
- **Jones, S. (1995).** Social and environmental aspects of natural resources management and rural development in Eritrea, 17p. Final Project Report for the Ministry of Agriculture, Government of Eritrea, and Norwegian People's Aid, Oslo.
- **Jones, S. (1996).** Environmental Restoration in the Eritrean Highlands, *Arborvitae*, June (3): 12.
- **Jones, S. (2015).** Report attached from November 2014 International Oslo Conference on the status and prospects for African Mountain Forests.

PARTNERS

- Village administrations and local people in several villages across Karneishem District, Eritrea
- Ministry of Agriculture (primary partner) and Ministry of Education, Eritrea

DRYLANDS COORDINATION GROUP



- Norwegian People's Aid
- Drylands Coordination Group



Figure 1 Community land with native olive, juniper and grasses being measured by residents and ministry staff.



Figure 2 Ministry officials measure 20 year old juniper trees on restored rocky hillside.



Figure 3 Restored land to the right providing a landscape with a more sustainable mix of agriculture, grazing, wood supply, and biodiversity conservation, than was possible on degraded lands pre-1993.



Figure 4 Three areas of land use – 1. To the left is agriculture on the wetter slopes at the head of the valley where trees are protecting the upper slope (control – agriculture only); 2. In the centre is unplanted, degraded grazing land with poorly maintained terraces (no treatment, no agriculture); 3. To the right is restored land which was previously abandoned or used only for grazing, showing native trees and eucalyptus with improved grazing and soil stabilization (planted with olive, juniper and eucalyptus seedlings in 1993).