



Ministry of Foreign Affairs of the Netherlands



World Vision



Landscape restoration

Ethiopia

Impact brief series

Landscape restoration is far more than land restoration - the ultimate solution to poverty and migration in dryland areas.

Background and context

Throughout the developing world, dryland areas have become heavily degraded to the point they are barely productive, reducing agricultural production and economic development. In Ethiopia, more than 85 percent of the country is degraded to some degree due to loss of vegetation and erosion, and the annual cost of land degradation is estimated to be a loss of US\$4.3 billion.¹ The agriculture sector is driven by smallholders, who account for 95 percent of agricultural production and 85 percent of all employment in Ethiopia.²

As a result, smallholders in dryland areas – which make up 46 percent of Ethiopia's arable land – are predominantly impacted by land degradation. Coping strategies in these areas are limited and degradation can lead to food shortages, conflicts and high rates of rural-to-urban migration. Many feel they have no option but to take the perilous journey to the Gulf State or Europe in search of a better quality of life.

Landscape restoration is seen as the ultimate solution to these chronic problems of deforestation and land degradation. To respond to the challenges of degradation in dryland areas, the Drylands Development Programme (or DryDev) in Ethiopia has adopted a context-based, **sequentially integrated landscape restoration approach** in 29 sub-watersheds³ of six districts.

What has DryDev already achieved?

Landscape restoration has reinvigorated the rural economy in dryland areas. Springs have recovered, irrigation water is plentiful and biodiversity has increased. The valleys retain moisture for longer and have become delightfully green. Farm productivity has increased, boosting sales to rural and urban markets. Household savings and incomes have grown and communities are more confident about their future.

1. Gebreelassie S, Kirui OK, Mirzabaev A (2016) *Economics of land degradation and improvement in Ethiopia*. In ENkonya et al. (eds) *Economics of Land Degradation and Improvement – A Global Assessment for Sustainable Development* (Springer Chan), pp 401-430.
2. See <http://www.fao.org/ethiopia/fao-in-ethiopia/ethiopia-at-a-glance/en/>
3. A sub-watershed (SWS) is a small part of a larger watershed that is large enough to see outcomes.



Gully in Maago sub-watershed, 2014

Land degradation had split the community of the Maago sub-watershed in half. The 35-metre-wide gully forced women and children to walk long distances to fetch water and go to school each day. Gully restoration – thanks to community mobilization, check dams, gabions and planting of trees and grass – has brought the community back together again.



Restoration in Maago sub-watershed, 2018



Terraces, Tseada Emba



Community is mobilised to undertake rehabilitation work, Tseada Emba

How has DryDev made this happen?

Landscape restoration has been achieved through community mobilization, investment in governance structures at a local and national level, and through capacity-building.

Mobilization

In DryDev's sub-watersheds, 58,429 farmers (including 22,441 women) rehabilitated 43,678 hectares of land. Complimentary land restoration techniques have been used to reduce erosion, via the use of terracing, gully reclamation and Farmer Managed Natural Regeneration (FMNR). Smallholders can now capture rainwater with trenches, pits and check dams. Over two million trees were planted to protect slopes and greater water infiltration has improved moisture retention along the landscape gradient. As a result, 3,500 hectares of pasture and 2,585 hectares of irrigation land has been brought into production between 2014 to mid-2018.

“With training from the programme, we now have a responsibility to sustain our watershed ... our development activities must be integrated to see the changes in our sub-watershed.”

– Jarso sub-watershed committee member

Each sub-watershed committee is composed of seven to eight community representatives – and 30 percent of these are women. Their role is to plan and implement activities in their sub-watershed, mobilize resources and monitor progress.

Governance at the local level

Interventions have been customized for each sub-watershed through district and sub-watershed governance structures. Six district platforms have been established, which are made up of government representatives, field staff and community members. Members meet quarterly to integrate activities and engage government support. So far, 330 farmers, including 81 women, have engaged in representing their communities to the government and as a result, have leveraged US\$3.3 million of community labour and local materials.

This governance framework has enabled bottom-up planning and visioning, coordination, and joint monitoring and reflection. Community ownership is stronger as local priorities have been selected and addressed.

For sub-watersheds that were steep and compressed, such as those in the highlands of Kilde Awulalo, Samre and Jarso, investments have focused on stabilizing the shallow rocky soils found on communal sloping land by building stone terraces, trenches, FMNR and enrichment planting (Table 1). In flatter lowland Boset, investment have included the creation of micro-basins in farmer fields, which are more amenable than highland areas for such efforts. This has also improved utilization of nearby flat lands for grazing or irrigation (Table 2).

Table 1: Variation in higher-slope land restoration structures, as indicated in a representative SWS per district

Representative sub-watershed and district	Stone terraces (km)	No. of deep trenches in communal area	Enclosure area with FMNR (ha)	Enrichment planting area (ha)
Maago, Kilte Awulalo	35	5,134	0	12
Mudi, Jarso	22	6,500	25	50
Bara, Samre	0	657	429	10
Dimello, Tseada Emba	4	4,000	250	570
Obele, Gursum	30	0	9	30
Osole, Boset	17	0	24.5	70

Table 2: Variation in lower-slope land restoration structures, as indicated in a representative SWS per district

Representative sub-watershed and district	No. of hand-dug wells	No. of pits and micro-basins in on-farm area	Length of installed irrigation canals (km)	Improved grazing area (ha)
Maago, Kilte Awulalo	10	0	7	15
Mudi, Jarso	10	7,200	10	5
Bara, Samre	0	0	0	5
Dimello, Tseada Emba	6	0	6	12
Obele, Gursum	0	0	25	3
Osole, Boset	0	40,325	0	60

Capacity building

Landscape restoration would not have been possible without significant investment in the capacities of farmers. Over 25,000 farmers (38 percent of these are women) participated in training on soil and water conservation and management. Almost 80 percent of farmers are now practicing these techniques.

Many farmers have indicated that their attitudes have changed. The previous mindset – that land is impossible to restore – has been challenged. Landless youths have shown they can make economic use of previously degraded areas, such as turning degraded lands into terraces for market gardens or bee-keeping. Climate-smart agriculture techniques have been widely adopted, with 97 percent of farmers in the target areas now practicing mitigation approaches.⁴

Over 90 percent of farmers are now aware of energy efficient technologies, which can reduce the drivers of deforestation. Over 50 percent of farmers are putting these technologies into practice.

Efforts by governance structures and capacitated farmers have helped to ensure that increased moisture in lower slopes is effectively converted into pasture and crops. Preliminary assessments from a sample of six sub-watersheds (one per district) indicates that pasture land grew four-fold to 547 hectares and irrigation land trebled to 539 hectares. Tree cover was estimated to have increased by almost 60 percent across the representative sub-watersheds due to DryDev.

Formation of groups, extension support with associated technology access, facilitation by project staff, and market linking to a range of buyers and markets led to a doubling of prices earned by farmers in Boset.

In drier parts of Tseada Emba where irrigation was not feasible, savings groups were started, allowing members to take out loans. With DryDev facilitating extension officers and market linkages, the groups are now working in a commercial manner with increased incomes.

4. DryDev Uptake and Sub-Outcome Tracking Survey (termed DryDev's Uptake Survey) is an annual snapshot to determine the extent by which training has been taken up and put into practice by participating farmers.

Landscape restoration

The beneficial effects of the physical environment and the newly-learned methods to sustainably convert natural resources into market sales has ultimately led to dietary changes, reducing hunger; increasing income and improving livelihoods in the following ways:

1. Minimum dietary diversity has **increased from 1.89 (in 2015) to 5.07 (in 2018)**
2. Number of hungry months p/a **reduced from 3.4 (in 2014) to 1.6 (in 2018)**
3. Average household income and expenditure **nearly doubled (to US\$1,286 and US\$1,080 respectively)**

Can this be scaled up?

Evidence that DryDev's landscape restoration approach can be scaled up is visible in the efforts of district government staff transferring their learnings to new sites. In Tseada Emba and Kilte Awulalo, where land degradation is widespread, Agona and Maago sub-watersheds have become learning sites, hosting government and farmer groups – allowing them to see for themselves the changes taking place.

Further support for scaling up was provided in DryDev's external review, which stated that landscape restoration, as practiced by DryDev, has a huge scaling up potential in Ethiopia due to the close alignment with the government's existing Sustainable Landscape Management programme in 177 districts. The external review observed that projects focusing solely on natural resource management (NRM) are unlikely to succeed, and that integration must take place to link NRM with agriculture, income-generation and markets.

Points to consider for scaling up

- Landscape restoration becomes vital when socio-economic pressures are high. Farmers become encouraged to mobilize, work together and invest effort in their sub-watersheds when benefits of the investment – such as landscape changes, savings, income and increased food production – are rapidly realized. The quicker mobilization and integration occurs, the more development and productivity can flow.
- Land restoration efforts should be coupled with capacity-building activities which support farmers as they transition from a subsistence mindset to a more commercial approach. This gives farmers confidence in how to best manage their landscape in a sustainable manner.

- Sustained bottom-up planning and coordination occurs best within a governance framework; implementation can then be customized and sustained when these frameworks support the deepening of community ownership, joint monitoring, and leveraging of resources. Bottom-up planning without a governance mechanism, or a governance framework without bottom-up planning, might not have worked.
- Sequential and integrated implementation of interventions – from upper-catchment to lower, and from growing to selling – was a further factor for success.
- Identifying products that might have a comparative advantage within specific sub-watersheds and the subsequent linking of these products to a market – thus cutting out the middlemen – has hugely benefited producers. Farmers have gained income benefits when producing collectively and when linked by commercial arrangements.



Lack of access to water in Kilte Awulalo, 2014



Springs have recovered in Kilte Awulalo, 2018

Mr Atsbeha, a 65-year-old farmer from the Maago sub-watershed in Eastern Tigray recalls how years of drought in the 1980s, followed by years of over-cutting and grazing, impacted vegetation cover. Soil washed from the hills into the valley, gullies emerged and flooding became a major problem. People were forced to migrate to make a living.

Government efforts were directed at mobilizing the community to build terraces and stabilize soil erosion – but this singular approach couldn't reverse the degradation.

DryDev introduced an integrated approach with a focus on training and capacitybuilding. According to Mr Atsbeha, the most valuable assistance was not just building terraces and irrigation, but training on crop production, business planning and linking to markets.

“We pass on our training to the community and everyone can get involved.”

Efforts are now paying off – water is available and farmers can irrigate year round.

“Everyone has an irrigation plot and we produce three to four crops per year ... in my household, we now have extra income to put towards food, clothes, medicines and education expenses.” Others are reinvesting their income into animal fattening or buying houses in town. “We now have a continuous income stream,” he said, “and rather than just eating one kind of food all the time, we have many types of vegetables in our diet, even meat ... we have enough food to cover us all year round rather than five to six months shortage.”



Mr Atsbeha, Ethiopian farmer

“We now have a continuous income stream and have enough food to cover us all year round. Everyone can get involved ... women who were previously never on any committees are now actively participating.”

– Mr Atsbeha, Ethiopian farmer

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www.drydev.org