

# DECISION MAKER'S NOTE

## DRY LAND SOIL AND WATER CONSERVATION

Developing an adapted lowland agricultural extension concept for soil and water conservation to increase resilience in Afar and Somali Region

## Key take-away messages

- There is an urgent need to develop agricultural extension material for Afar and Somali region due to high community interest and dynamic changes derived from environmental, economic, land use and price changes
- Infrastructure such as Water Spreadings Weirs, Dry Stone Measures and other water retention structures must continue to be the backbone of interventions in the lowlands
- Extension material needs to be specific to the lowland conditions and in particular the needs of pastoralist communities and the opportunities in lowland soil and water conservation with a focus on maintenance
- Institutional innovations such as upscaling the recruitment of DAs alongside improved training of DAs in lowland agro-ecology and agronomy will be crucial for long-term success.

## Introduction

Extension is the application of the latest best practices into an applied setting to train land and water users. It has shown to be highly effective through on-the-ground training through different methods. Agricultural has changed from a mere focus on yield increase to a further incorporation of modern-day challenges such as climate, environment, land use and prices to enable farmers to cope with those impacts on farming.

Agricultural extension is also well-known in Ethiopia, yet there is a gap of application in the lowland areas. In order to increase the resilience of the local agro-pastoralist and pastoralist population, a total of 20 pieces of material are being developed and targeted towards the rural population. This material includes videos, manuals, infotechs, discussion posters, discussion games, flip books, guides, and radio programme. This extension material supports help communities and extension agents to understand the lowland environment and to support communities with soil and water conservation practices, with a specific focus on women and youth to ensure inclusivity.

## Why soil and water conservation matters to lowland communities?

The Ethiopian lowlands are amongst the most affected by climate change globally. Due to extreme conditions, very hot temperatures, low rainfall, little arable land and limited access to water, the majority of the rapidly growing population depends on semi-mobile livestock farming (pastoralism) for a living. This economic and social system is currently coming under pressure. The effects of climate change are adding pressure to natural resources, especially in dry valleys. The consequences are overgrazing, an increase of invasive species and conflicts over land and water. Crucial to increased resilience is the management of available soil and water resources in dry valleys in the lowlands. The lowlands receive very significant floods from the Ethiopian highlands during the rainy seasons in March/April and June/July/August, which are now however leading to dangerous gully erosion and very little water infiltration into the soil. These gullies have been growing for years threatening not only food production but also urban settlements as for example Jigjiga will be reached by gullies in less than 10 years.

If dry valleys were rehabilitated, the flood water from the highlands could be captured in a more efficient manner to be used for food production and thus greater resilience to the aforementioned challenges. This would enable local communities to mitigate droughts, associated food price shocks, conflict over water for grazing and decrease poverty levels.



*Gully erosion in Somali Region (GIZ/SDR-ASAL)*

## What is a possible approach for better resilience through soil and water conservation?

German Development Cooperation has funded the construction of water spreading weirs (WSWs) in first Afar and later Somali region since 2015 under as an ecological, holistic approach to rehabilitate dry valleys, the so called Dry Valley Rehabilitation and Productive Use Approach (DVRPU). This approach is a community-based (demand-driven) approach to rehabilitate degraded land and induce water and soil conservation. WSWs are low retention walls designed to dissipate flash flood into rangelands and farms while also reducing runoff and soil erosion. Constructed by using natural stone and cement, they lead to a spillway in the dry riverbed itself. WSWs spread the floods and in this

way cause the deposition of sediments that can improve the depth and quality of soils.

Next to WSWs, the community together with the woreda experts and masons, may also opt for smaller interventions. At present, 50 Dry Stone Measures (DSM) have been constructed in Afar. Those small stone dams are constructed at the right angle to the water flow. The dam will create a small terrace and the head of the dam will be the new counter line. The height and slope of the DSM is adjusted to local soil conditions and topography. Small stones and gravel at the base create good soil cover. The cover of the dam with bigger stones ensures good stability.

In order for WSWs and DSMS to work in the most effective manner, a system of cascades may lead to the most successful restoration of the dry valleys. Up to 20 or more weirs in one valley adapted to the topography and local conditions combined with a large number of DSMS and biological interventions may rehabilitate large swathes of land and secure soil moisture for crop production or rangeland improvement.

## Policy recommendations

From a policy perspective, we acknowledge the increased focus of the federal government to improve livelihoods in the lowlands. We particularly suggest to place the emphasis on the strengthening of the extension services for the pastoralist and agro-pastoralist communities of the lowlands, including the use of appropriate extension material on soil and water conservation, as captured in the Dry Valley Rehabilitation and Productive Use Approach. The government should focus on long-term staff recruitments to develop competent and skilled human capital amongst Development Agents (DAs).

Education and training of farmers should lead to more specialization and diversification of pastoralist and agro-pastoralist farmers to allow them to transition from mere self-sufficiency-based farmers to gradual exporters of crops to other regions in Ethiopia. In addition, farmers should be trained in maintenance of both infrastructure interventions and agricultural equipment. Agricultural extension should also first and foremost focused on the potential of rainfed agriculture and flood-based water conservation methods. By deploying a participatory approach, gender mainstreaming must be mandatory to integrate all members of society. Finally, agronomic literacy of farmers must play a key role together with improved access to finance.

**Table 1: Soil and Water conservation measures for better resilience**

**Water Spreading Weirs (WSWs)**



Source: GIZ/SDR-ASAL

**Dry Stone Measures (DSMs)**



Source: GIZ/SDR-ASAL

<b>Average size/ length</b>	Length 100 – 400m Volume 250 – 750 m <sup>3</sup>	Depth of the gully should not be more than 2 meters. The height-width ratio is 1:3 and in case of high expected flows 1:5. If build in cascades, the distance between DSMs is 10 – 20 meters.
<b>Approx. investment to build (time and funds)</b>	The WSWs are constructed in cascades of up to 10 WSWs. The average cost of one WSW is up to 15.000 euro. Construction takes place in the dry season.	Depends on the depth of the gully and the sizing/ volume of the DSM. Average construction of 1 m <sup>3</sup> /person/day. Cost is minimal as use is made of natural stones from the surrounding areas.
<b>Level of expertise needed</b>	Trained masons and foremen are involved from the community for construction and maintenance. Other community members can contribute through the transport of stones and excavation.	Demarcation needs to be carried out by experts. Excavation and construction can mostly be carried out by the community members.
<b>Further resources</b>	Flipbook and video on WSW <a href="https://wocatpedia.net/">https://wocatpedia.net/</a>	Flipbook and video on DSM

