Local Knowledge in Soil and Water Conservation in the Central Highlands of Eritrea

For centuries farmers have been cultivating the land in the Central Highlands and protecting it against soil erosion. This project endeavors to tap this valuable knowledge for future conservation programmes.

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Soil and Water Conservation: A top priority in Eritrea

In the Central Highlands of Eritrea, the effect of erratic rainfall, steep slopes, and low vegetation cover combined with current land management practices lead to degradation of the land and its productive capacity. Soil and water conservation (SWC) measures are a way to counter the effects of land degradation.

Investments in soil and water conservation are dominated by physical structures. Government initiated mass food-for-work and cash-for-work campaigns are the primary means for the implementation of these structures. However, many of them have not been adopted and maintained by farmers.

A farmer participatory study, taking the Afdeyu catchment as a representation of the Central Highlands Zone, undertook to understand and generate information on traditional knowledge of SWC. This information was seen to contribute towards:

- more informed decision making by all stakeholders concerned
- the promotion of locally adapted and accepted technologies
- appropriate approaches for research and development activities

This map underlines the correlation between soil fertility and the condition of SWC measures. The limited resources of a small-scale farmers' household have to be concentrated on the high-potential areas. On marginal areas and on communal land, maintenance fails, implying serious knock-on effects further downstream.

Photo 1: Traces of conservation history in one picture: 1) traditional stone terraces used for generations, 2) a sisal fence introduced by the Italian colonial administration and 3) stone and earth bunds recently implemented by government initiated mass campaigns.

Wealth of local knowledge and challenge of maintenance

The study identified a high diversity of SWC technologies, i.e. 13 local and 10 introduced measures – and most of them applied in combinations. The area coverage of SWC measures was found to be high, but they lacked maintenance. This reduced their effectiveness.

What are the reasons behind the lack of maintenance?

- Human: lack of manpower (not least due to off-farm employment), lack of extension / farmer involvement (communication problems)
- Social: short term land use rights, religious norms, lack of community collaboration
- Physical: lack of farm implements and draught oxen
- Natural: shortage of productive land (structures consume land)
- Financial: lack of financial incentives

Preconditions for farmers to maintain SWC

- Consider local conditions and individual farmers' needs and capacities
- Ensure low (external) input
- Increase yield and minimise risk
- Integrate SWC measures into existing land management system

Lessons learnt for improved impact

Improve and institutionalise knowledge exchange between farmers, extension, and research.

The involvement of local knowledge in reducing land degradation and improving food security will:

- help to reduce high government expenditure for mass campaigns
- target limited financial and human resources more efficiently
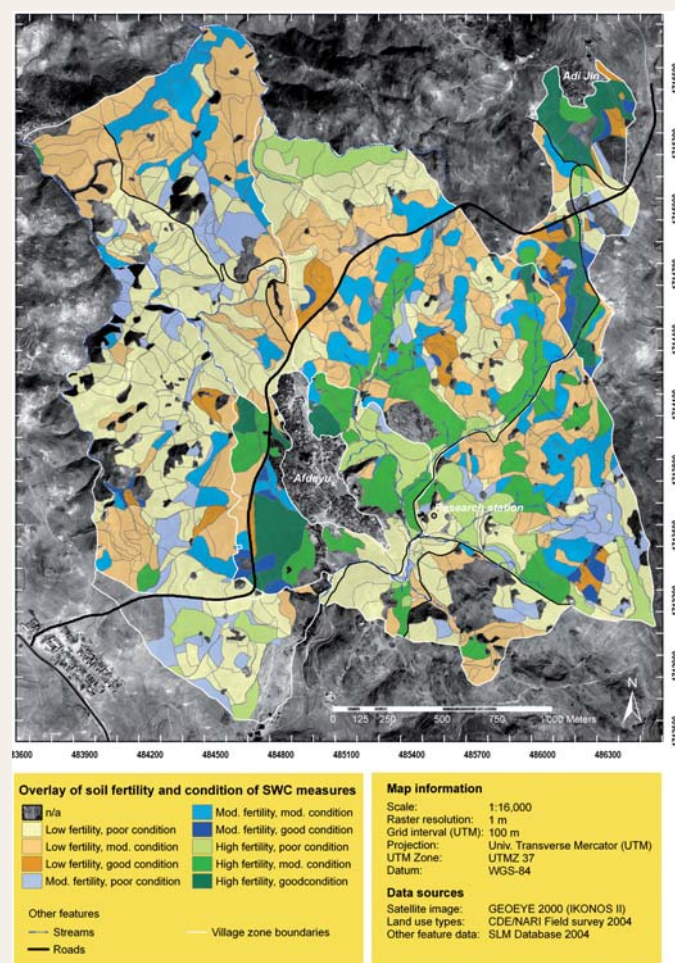- lead to a higher rate of acceptance, maintenance, and efficiency of SWC

Photo 2: A match between local knowledge and modern technology (remote sensing imagery): Allows for exchange and combined use of local and external knowledge.

In comparison to an untreated control plot, appropriate and well-maintained SWC measures not only reduce soil loss by 50–80%, but also efficiently conserve water, which is of particular importance in a semiarid area.
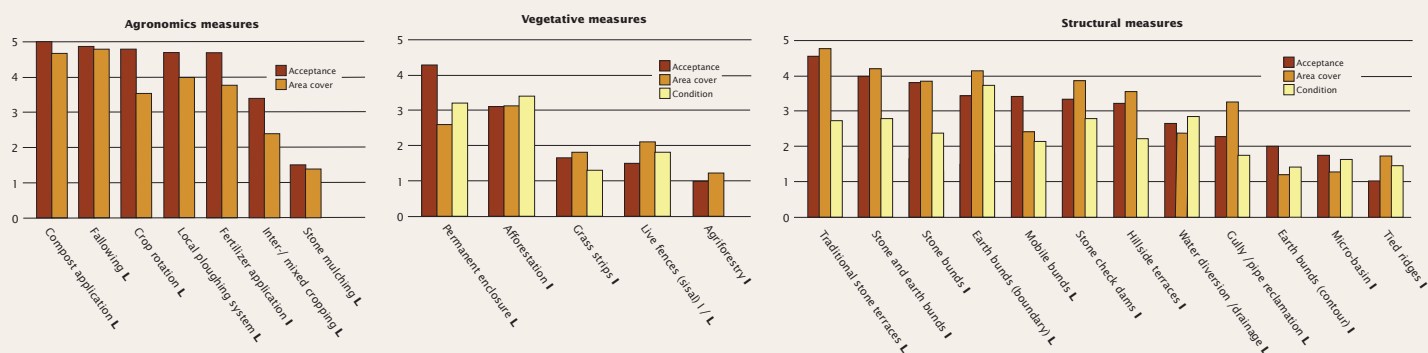*Source: Afdeyu Research Sub-station, 1985–1990*

Photo 3: Terraces conserve moisture, which is clearly reflected in crop performance.

Ranking: 5=very high, 4=high, 3=moderate, 2=low, 1=very low   Implementation: L=local, I=introduced

Figure 1: Acceptance, area coverage and condition of the examined SWC measures.