



A Case Study of the Aberdare Water Tower in Nyandarua County, Kenya Fact sheet

In Kenya, the Aberdare Ranges are home to the Malewa river catchment area in Nyandarua County, which is one of five main water towers in Kenya providing over 90% of the water to the city of Nairobi. In addition, the water tower provides important ecosystem services to surrounding communities. Most of the people in the Aberdare area engage in rainfed agriculture for their livelihoods and depend on water originating from the Aberdare's ecosystem to sustain themselves. Increasing population has put a lot of pressure on agricultural landscapes leading to less productive land and decreasing ecosystem services. Adopting sustainable land management (SLM) practices and ensuring functioning ecosystem services is key to restoring the productivity of land in the Aberdare Ranges. This study uses the Economics of Land Degradation (ELD) approach to assess the costs of land degradation and farmers' preferences for the adoption of different SLM practices in order to enhance freshwater and soil conservation for urban water supply and crop production.

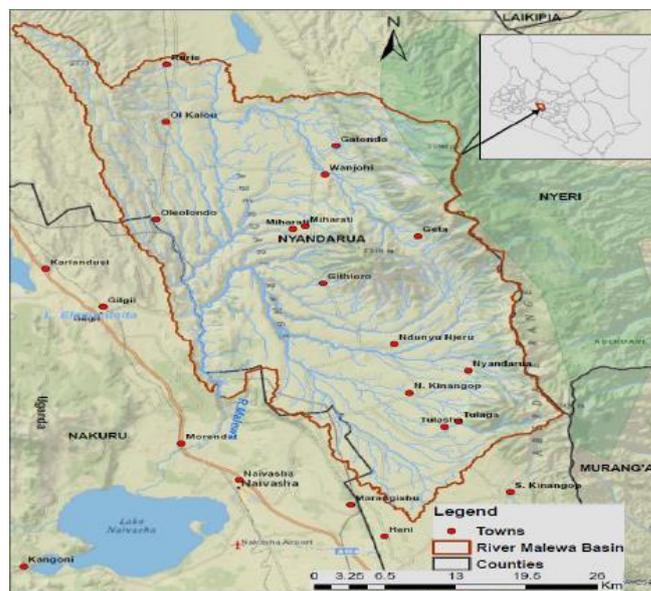
The Value of Land

Established in 2011, the Economics of Land Degradation (ELD) Initiative aims at transforming the global understanding of the economic value of productive land, and thus the cost of its degradation. Another objective is to improve stakeholder awareness of socio-economic arguments to promote sustainable land management. ELD provides tools and assessments that allow stakeholders to undertake cost-benefit analyses of land and land uses through a total economic valuation and include the results into decision-making.

therefore to adopt sustainable land management (SLM) practices to restore the productivity of land in the Aberdare region and ensure the continued provision of ecosystem services to communities.

Background

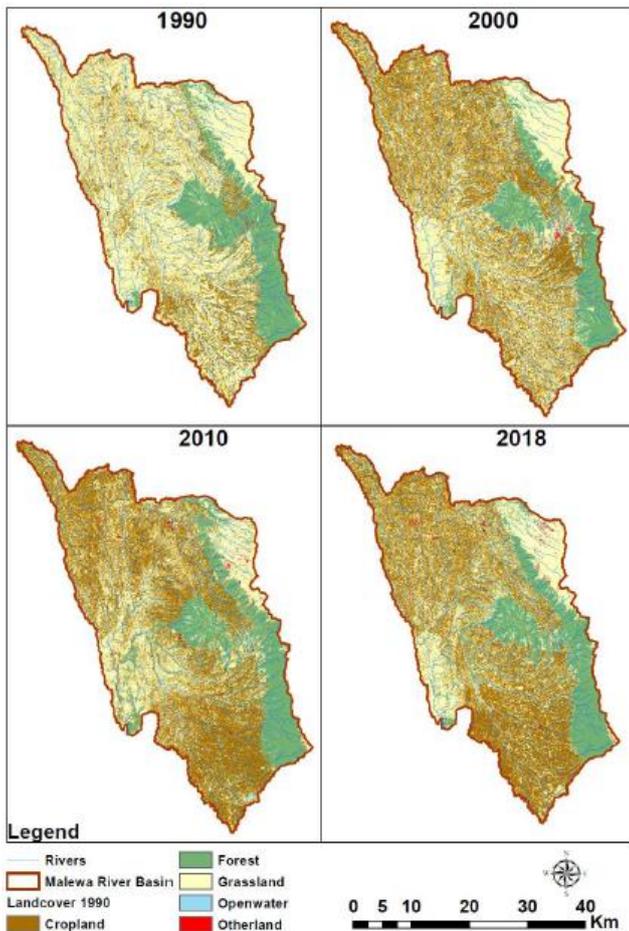
Located in Central Kenya and covering an area of 181,594 hectares, the Aberdare forest is a gazetted nature reserve that hosts the Aberdare National Park and is a catchment for some main rivers in Kenya. The eastern slopes are catchments of Kenya's largest river, the Tana River, which supplies water to the Seven Forks hydropower plants, providing over 55% of Kenya's total electricity. The tower also acts as the catchment for Sasumua and Ndakaini dams, which provide over 90% of the water to the city of Nairobi. As most of the people in the Aberdare area live from rainfed agriculture, they depend on water originating from the Aberdare ecosystem. A growing population has led to less productive lands and curtailed its ecosystem services. The key is



River Malewa basin showing the network of rivers and streams (source: Shatete M. - KWTA)

Results

SLM practices include agroforestry, vegetative strips, terracing, crop rotation or their combination, just to name a few. For the CBA, three different scenarios were considered, namely business as usual (BAU), a worst-case and a best-case scenario. BAU shows that agroforestry and crop rotation present the highest net present value (NPV) followed by vegetative strips, while the



Land cover changes between 1990 and 2018

mixed scenario indicated that vegetative strips, organic crops with cover crops, and terracing, in that order, presented the highest benefit-cost ratio (BCR). In the worst-case scenario, the resulting values were relatively lower indicating low returns. In the best-case scenario, cropping combined with other practices has the lowest NPV. The BCR from this scenario shows that vegetative strips still gave the highest rate of returns, followed by cover crops

and organic farming, while agroforestry combined with organic farming present the lowest ratios. It was therefore concluded that SLM practices of vegetative strips, agroforestry and crop rotation, as well as cover crops and organic farming present the most viable SLM options for farmers. Mixed cropping presents the least viable option.

Recommendations to land users

- Establishment of a **platform for sharing information** between the land users that are practicing different forms of SLMs e.g. promotion of **farmer focus groups**.
- **Adoption of soil quality assessments** by land users as a prerequisite to planting crops. This will save the land user from wasting fertilizer which is also useful to the conservation of soils and a buffer against pollution and eutrophication.

Recommendations to the private sector

- Adoption of soil quality as an indicator of SLM by land managers while **providing farmers easy access to soil nutrient analyses**.

Recommendations to public decision-makers

- Establishment of a system that **fosters information exchange** between SLM practitioners e.g. **farmer field groups**.
- Promotion of **guidelines geared towards SLM practices** that act against soil erosion and maintenance of fertility.
- Investment into **documenting and evaluating SLM practices** and their impact on ecosystem services.



Smallholder farms in Nyandarua County

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