



THE ECONOMICS OF LAND DEGRADATION

A Global Initiative for Sustainable Land Management



UNIVERSITY of RWANDA



Ecosystem Services and Land Degradation in Gishwati-Mukura Corridor, Rwanda: Cost Benefit analysis

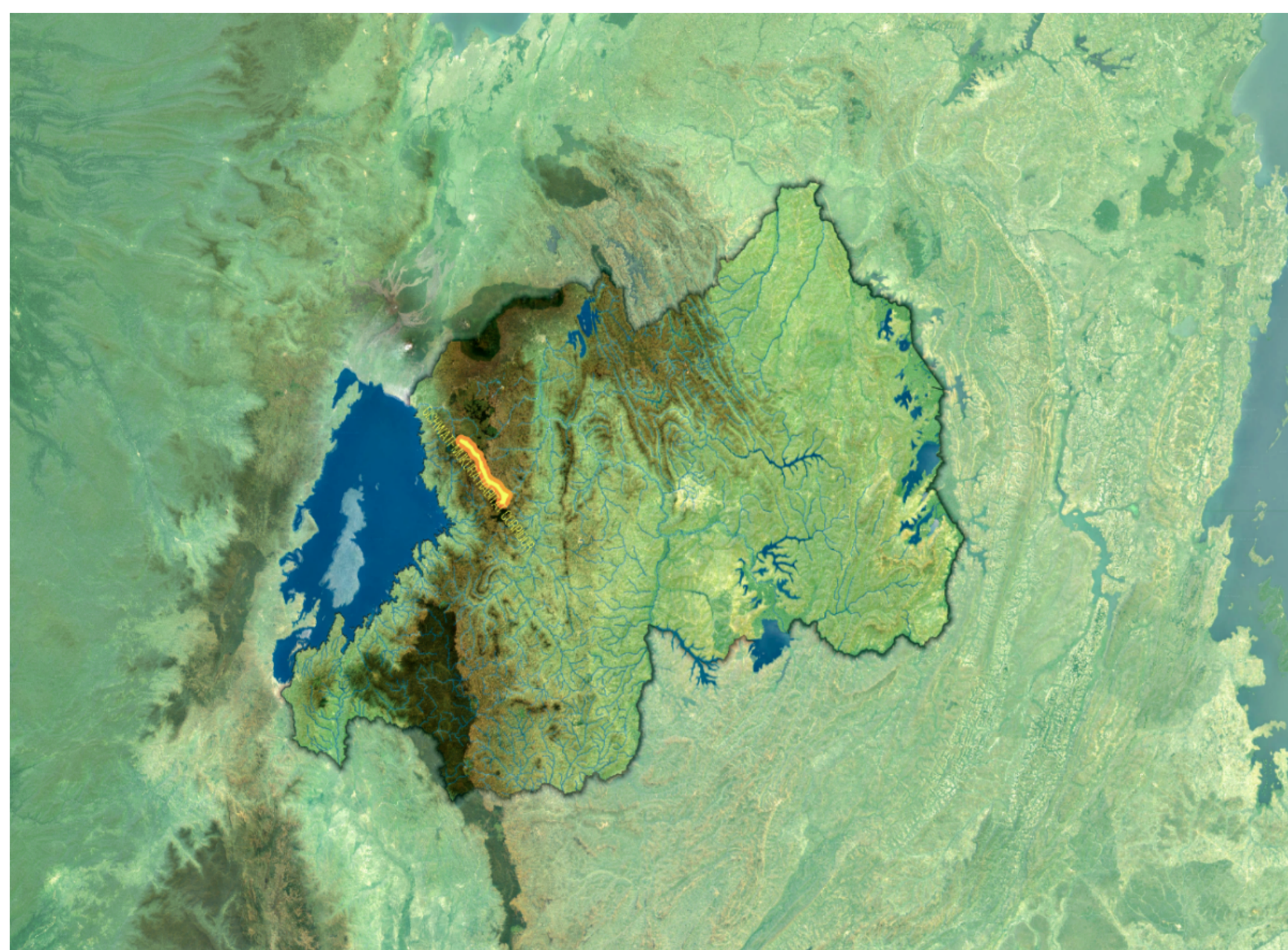
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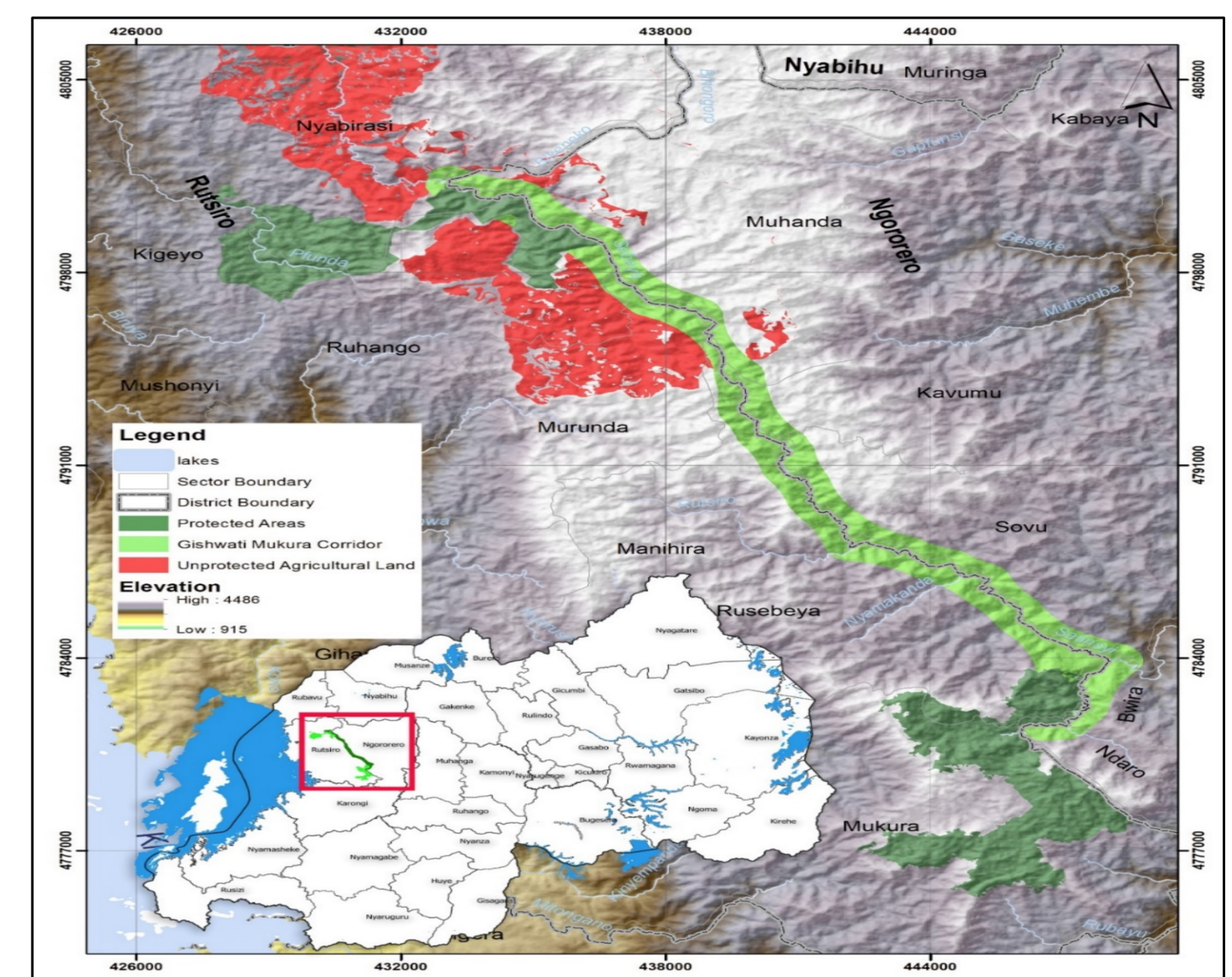
1. CONTEXT AND PROBLEMS

- Land degradation leads to a loss of services from land and land-based ecosystems, such as food production, water availability and energy security, which are necessary for human livelihoods and economic development.
- Land degradation impacts on ecosystems are severe for the rural poor in Rwanda where over 70% of population live in rural areas and 69.4% of the workforce are employed in agriculture.
- As Rwanda strives to end poverty, linkages between poverty and ecosystem services results in poor land management and their continuing degradation. Underestimation of the values of ecosystem services results in poor land management and their continuing degradation.
- Gishwati and Mukura landscapes are among the fragile ecosystems facing high rates of land degradation in terms of deforestation, loss of biodiversity, soil erosion and landslides due to intense agriculture and grazing, deforestation for firewood energy for cooking, and mining activities. There is therefore a need to assess the current drivers of land degradation and the resulting impacts on human well-being using Gishwati-Mukura Corridor (GMC) as a case study, and to identify which sustainable land management options are most feasible.

2. STUDY AREA



GMC is a part of Gishwati-Mukura landscape which is very prone to severe effects of land degradation in the form of landslides, soil erosion, decline of soil fertility, and deforestation. Moreover, GMC holds natural forest reserves and fragile landscapes that are under encroachment of human activities.



3. OBJECTIVES

- To assess the current land management practices and associated effects on ecosystem services of GMC from a community perspective (farmers, pastoralists, local leaders, and cooperative leaders). It is intended to raise awareness of policy-makers on sustainable land management and ecosystem services restoration, and therefore support the fight against land degradation in surrounding areas of GMC.
- To document the policy context and national management strategies for GMC; map different land cover and land use patterns; identify key ecosystem services provided by GMC; and conduct a cost-benefit analysis (CBA) of different scenarios of sustainable land management (SLM) practices from a community perspective.
- The scenarios selected were: 1) Business as usual (BAU) or status quo; 2) landscape restoration by terracing and related improved soil fertility management; 3) landscape restoration by planting and retaining exotic species (eucalyptus); and 4) landscape restoration by planting and retaining indigenous species

4. METHODOLOGY

ELD Initiative's '6+1 step' approach:

Inception, determination of geographical characteristics of the study area, identification of types of ecosystem services, estimation of economic value of the key ecosystem services, description of land degradation patterns and drivers, and cost and benefits analysis (CBA) of the sustainable land management options that can reduce the degradation pressures.

CBA helped to compare the costs of adopting a sustainable land management practice against the benefits derived from it. Data used were collected through focus groups, and analysis of Google Earth images from July 2017 to calculate the afforestation area, grazing land, and crop land for each scenario. In addition, the number of households to be compensated for scenarios 3 and 4 were counted and digitized from Google Earth image.

For every scenario, the study used the discount rate of 9.8 % which was the World Bank average interest rate for 20 years. This permitted calculation of the Net Present Value (NPV) and the annuity factor of each crops or land use (Tilahun et al. 2016).

5. RESULTS

GMC is a part of Gishwati-Mukura landscape which is very prone to severe effects of land degradation that are registered every year in form of deforestation, soil erosion, landslides, and downstream sedimentation. The comparison of all four scenarios shows that the scenario on the restoration of the corridor by indigenous tree species offers higher economic and environmental benefits than other scenarios. The sensitivity analysis has shown that in most cases, changes in inputs and outputs prices are higher than those in discount rate. Increased value of the benefits due to their higher demands of food products such as milk, Irish potatoes, and Maize will offer high economic returns to the communities.

KEY RECOMMENDATIONS

- Farmers should continue to invest in SLM practices
- Agro-dealers should be supported in provision of agricultural inputs
- MINAGRI should train farmers to keep records on investments and benefits
- MINAGRI should provide information on prices and markets opportunities to farmers
- Exotic species should be avoided in the restoration of GMC



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