Benefits and possibilities

The remote sensing approach applies a standardised assessment and delivers homogenous quality over large areas and thus makes it a very useful tool for large scale monitoring such as required by LDN. At local level in Tusheti, the analyses on erosion risk and productivity provided the basis to create “pasture passports” determining the carrying capacity for livestock and, thus, to support shepherds to manage the corresponding pasture units sustainably.

The pilot maps produced in Tusheti show the high potential of remote sensing to create time series to monitor changes in land degradation. Further potential applications are:

- Monitoring the success of land degradation control measures, land cover and productivity at the national level
- Supporting the prioritisation of new intervention based on degradation levels

Next steps

- Adoption of new draft Law on Soil Protection
- Official approval of LDN indicators (by a governmental resolution)
- Initiation of an official LDN monitoring scheme considering the potential and benefits of remote sensing
- Sincere attempts to reduce land degradation and strive for LDN, focusing on national targets
- Mainstreaming of LDN into strategic development planning processes, such as spatial planning

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Integrated Biodiversity Management, South Caucasus (IBiS)

Bio *Brief*

Linking remote sensing to Land Degradation Neutrality (LDN)

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Figure 1: Pilot site in Shenako, Tusheti

The Programme “Integrated Biodiversity Management, South Caucasus (IBiS)” is financed by the German Federal Ministry for Economic Cooperation and Development (BMZ).

One of the objectives of IBiS is to contribute to erosion reduction and rehabilitation of degraded sites in Tusheti by introducing remote sensing in LDN monitoring. It is considered a key tool and source for basic information to identify needs for action of local planning processes.

Background

The ongoing global degradation of land resources threatens food security and the functioning of ecosystem services by reducing or losing their biological or economic productivity. Unsustainable land-use practices such as deforestation, overgrazing and inappropriate agricultural management systems trigger the loss and degradation of valuable land resources in Georgia. This process is amplified by the effects of climate change (e.g. droughts). Degradation effects are visible in all countries of the South Caucasus. About 35 % of the agricultural land in Georgia is severely degraded, 60% is of low to medium production quality.

Land Degradation Neutrality (LDN)

Definition: Land Degradation Neutrality
A state whereby the amount and quality of land resources necessary to support ecosystem functions and services and enhance food security remain stable or increase within specified temporal and spatial scales and ecosystems. (UNCCD Decision 3/COP

LDN is a new international concept to combat the ongoing degradation of valuable land resources. The LDN concept was developed by UNCCD (United Nations Convention to Combat Desertification) to encourage countries in the implementation of measures that may avoid, reduce or reverse land degradation with the vision of achieving a zero net loss of productive land by 2030 (SDG 15.3).

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To combat land degradation in Georgia, the national LDN Working Group set voluntary national targets to address specific aspects of LDN in 2017 and submitted them to the UNCCD Secretariat. These include:

- Integrate LDN principles into national policies, strategies and planning documentations and legislations.
- By 2030 about 1,500 ha of degraded forests will be reforested, about 7,500 ha will be afforested, and 60% of forests will be managed sustainably.
- By 2030, protected areas coverage should reach 12%.
- Degraded land will be rehabilitated.
- Irrigation and drainage system will be improved.

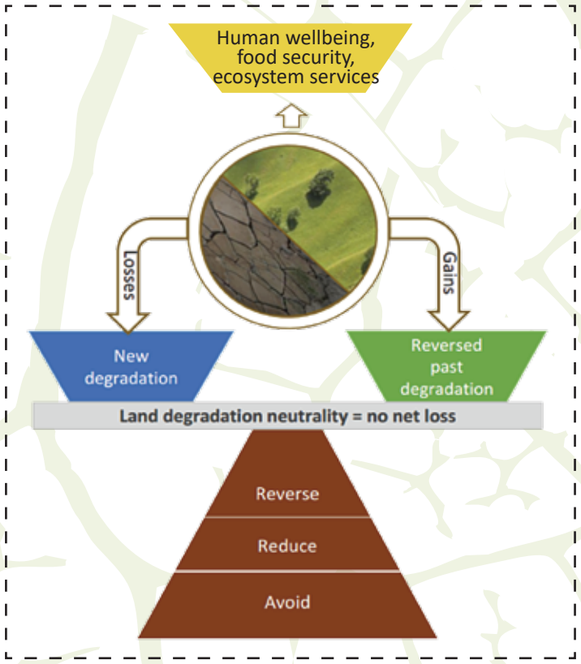


Figure 2: The LDN Approach

Monitoring LDN

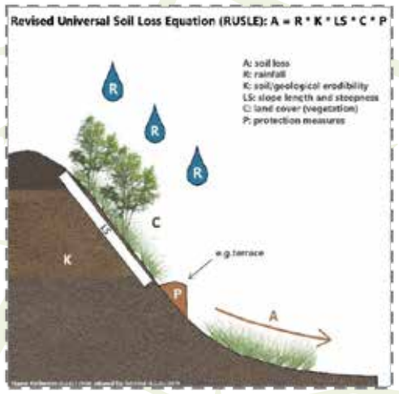
To assess the status of land degradation and to track progress towards LDN, a baseline must be established. Neutrality means that no net loss occurs compared to the baseline. The achievement of land degradation neutrality is monitored by quantifying the baseline and assessing the balance between land "gains" (positive changes) and "losses" (negative changes).

The SDG (Sustainable Develoemetn Goals) indicator 15.3.1 and its three global indicators Land Productivity, Land Cover Change and Carbon Stocks are defined as UNCCD reporting indicators. Beyond these, each country identified additional indicators that reflect the country context at the local level. In Georgia, these are Absolute Poverty, Soil Erosion and Soil contamination offered by LDN Working Group to be approved by Resolution of the Government of Georgia (according to the Georgian Draft Law on Soil Protection 2019). The development of a corresponding LDN monitoring system for Georgia aims to provide information, data and maps as a solid base for local spatial planning and decision-making processes and to track the progress towards the LDN targets.

The potential of remote sensing for monitoring LDN

Remote sensing tools are ideal for monitoring the LDN indicators Land Cover, Land Productivity and Soil Erosion on a national scale.

In Tusheti, the Soil Erosion Risk Model was applied to assess the current state and general risk of erosion. It is based on the RUSLE – Revised Universal Soil Loss Equation calculating erosion caused by rainfall and surface run off. Based on this model, the estimated average soil loss in tons per acre per year can be calculated. RUSLE can help to monitor the LDN Indicator Soil Erosion at a larger scale. Furthermore, in the Tusheti region, Sentinel 2 satellite images were used to analyse land cover and land productivity. Field sample points were used to calibrate the data from remote sensing.



The remote sensing assessment delivers a digital map in the scale of 1:25,000 showing degraded sites with low vegetation cover.

The erosion risk map can help to identify degraded landscapes and develop strategies to change land uses to avoid further damage of vegetation or to introduce activities to rehabilitate vegetation.

Figure 4: Soil Erosion Risk Map

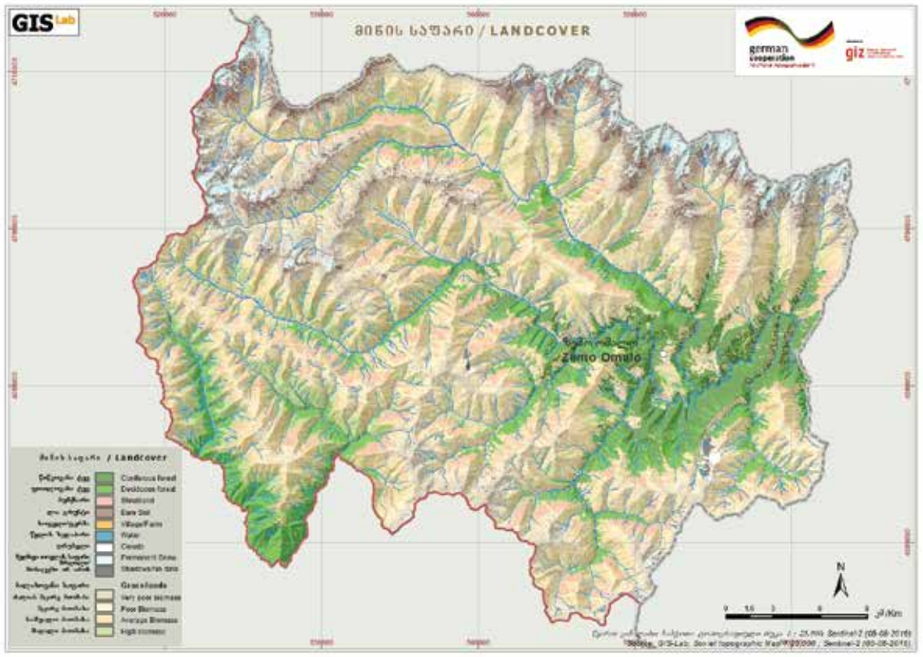


Figure 5: Land Cover Map