

LDN Municipal Strategy for Kvareli Municipality, Georgia (KVARELI LDN-2030)

*Prepared within the framework of the GEF funded Project
“Generating Economic and Environmental Benefits from Sustainable Land
Management for Vulnerable Rural Communities of Georgia”
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Prepared for GEF Funded Project

**“Generating Economic and Environmental Benefits from Sustainable Land
Management for Vulnerable Rural Communities of Georgia”**

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List of Abbreviations and Acronyms

CO	Carbon Monoxide
CO ₂	Carbon Dioxide
COP	Conference of the Parties
GEF	Global Environmental Facility
GHG	Greenhouse Gas
GIS	Geographical Information Systems
GM	Global Mechanism
ha	Hectare
km	Kilometer
LD	Land Degradation
LDN	Land Degradation Neutrality
LDN-MS	LDN Municipal Strategy
LDN TSP	Land Degradation Neutrality Target Setting Programme
MDG	Millennium Development Goal
MEPA	Ministry of Environment Protection and Agriculture of Georgia
MSI	Multispectral Imaging
NEAP	National Environmental Action Plan
NGO	Non-governmental Organization
RCM	Regional Climate Models
REC Caucasus	Regional Environmental Center for Caucasus
RS	Remote Sensing
SDGs	Sustainable Development Goals
SLM	Sustainable Land Management
SOC	Soil Organic Carbon

UNCCD	United Nations Convention to Combat Desertification
UNDP	United Nations Development Program
UNEP	United Nations Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change

1. Introduction

1.1. Background Situation

Georgia's agricultural sector plays a key role in the country's economy, employing 53% of the country's workforce, and the Government of Georgia identified agriculture as a key sector for rural development. Agricultural production is dominated by smallholder agriculture and small-scale livestock management that produces low-income levels, resulting in the rural population having the highest levels of poverty in the country. In general, climatic conditions and soil diversity in Georgia are favorable and conducive to a variety of agricultural activities. The decrease in agricultural production which began in the 1990s, is the cause of reducing of the soil quality and productivity, which in turn is caused by unsustainable use of land resources. Agricultural land, including pastures, is spread over more than 3 million hectares in Georgia (43.4% of the territory)¹, while 56.6% of rest of the territory is covered by forests and other non-agricultural lands (*inland waters, settlement areas etc.*)².

Land degradation is a significant problem for Georgia³. The forms of land degradation such as deforestation, wind and water erosion, landslides, overgrazing, soil exhaustion and soil contamination are spread throughout the country and are accompanied by socio-economic consequences. As per the latest estimate, about 35% of agricultural lands are degraded in Georgia⁴. Soil erosion, which has significantly increased in recent years, represents the most concerning form of land degradation in the country. Land degradation in Georgia is mainly occasioned by climatic conditions, topographical peculiarities of the country as well as anthropogenic factors. The geo-dynamic processes make the land more vulnerable to land degradation. Anthropogenic factors that cause land degradation in the country need urgent attention to limit the expansion of these factors and ensure cost-effectiveness of management options. These anthropogenic factors include improper agricultural practices such as overstocking that leads to overgrazing, and absence of good soil fertility management practices; and lack of contour ploughing.

Following the adoption of the Millennium Development Goals (MDG) and the declaration of the United Nations Decade for Deserts and the Fight Against Desertification (2010-2020), in September 2015, the United Nations General Assembly adopted "The 2030 Agenda for Sustainable Development", including 17 Sustainable Development Goals (SDG) and 169 targets. SDG 15 urges countries to protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss. Target 15.3 aims to "combat desertification, restore degraded land and soil, including land affected by desertification, drought and floods, and strive to achieve a land degradation-neutral world" by 2030. The indicator adopted to measure the achievement of SDG target 15.3 is "Proportion of land that is degraded over total land area". The monitoring of this indicator is based on the combined use of three sub-indicators, namely land cover, land productivity and carbon stocks above and below ground, enhanced and complemented with other nationally relevant indicators and contextualized with information at the national and sub-national level.

The twelfth session of the Conference of Parties (COP) of the United Nations Convention to Combat Desertification (UNCCD), held in Ankara, Turkey in October 2015, endorsed SDG target 15.3 and the concept of land degradation neutrality (LDN) as a strong vehicle for driving the implementation of the Convention. It invited all UNCCD country Parties to formulate voluntary targets to achieve LDN and requested UNCCD bodies

¹ Agricultural and Rural Development Strategy of Georgia for 2021-2027 // Approved by the Government of Georgia - Ordinance No.2665 of December, 2019 – *English Version*. <http://enpard.ge/en/wp-content/uploads/2015/05/ARDSG-FINAL-version-ENG.pdf5>

² The land in Georgia is divided into two legal categories: land designated for agriculture (crops, meadows and pastures, including village settlements) and land designated for non-agricultural purposes (forests, water bodies and urbanized areas). The use of agricultural land for non-agricultural purposes is prohibited.

³ National Environmental Action Programme of Georgia for 2012 – 2016 / Chapter 8 - Land Degradation // Ministry of Environment Protection and Natural Resources of Georgia // Approved by the Government of Georgia - Ordinance #127 of January 24, 2012. https://www.preventionweb.net/files/28719_neap2.eng.pdf

⁴ Environmental Performance Review : Georgia 2016 / Environmental Performance Reviews Series No. 43, Georgia - Third Review // The United Nations Economic Commission for Europe (ECE) Environmental Performance Review Programme / United Nations, New York and Geneva, 2016. https://www.unecce.org/fileadmin/DAM/env/epr/epr_studies/ECE_CEP_177.pdf

to provide “guidance for formulating national LDN targets and initiatives” and to facilitate “the use of the UNCCD indicator framework as a contribution to the monitoring, evaluation and communication of progress towards the national LDN targets”.

In response to the decisions taken by the UNCCD COP.12, the Global Mechanism (GM) of the UNCCD established a LDN Target Setting Programme (TSP), which aims to support countries to define national LDN targets and associated measures. In 2015 Georgia expressed willingness to participate in the LDN Target Setting Programme (TSP) to define voluntary national targets. In 2016, the national LDN Working Group in Georgia set voluntary national targets to address specific aspects of LDN and submitted them to the UNCCD Secretariat. These targets are aligned to the SDGs:

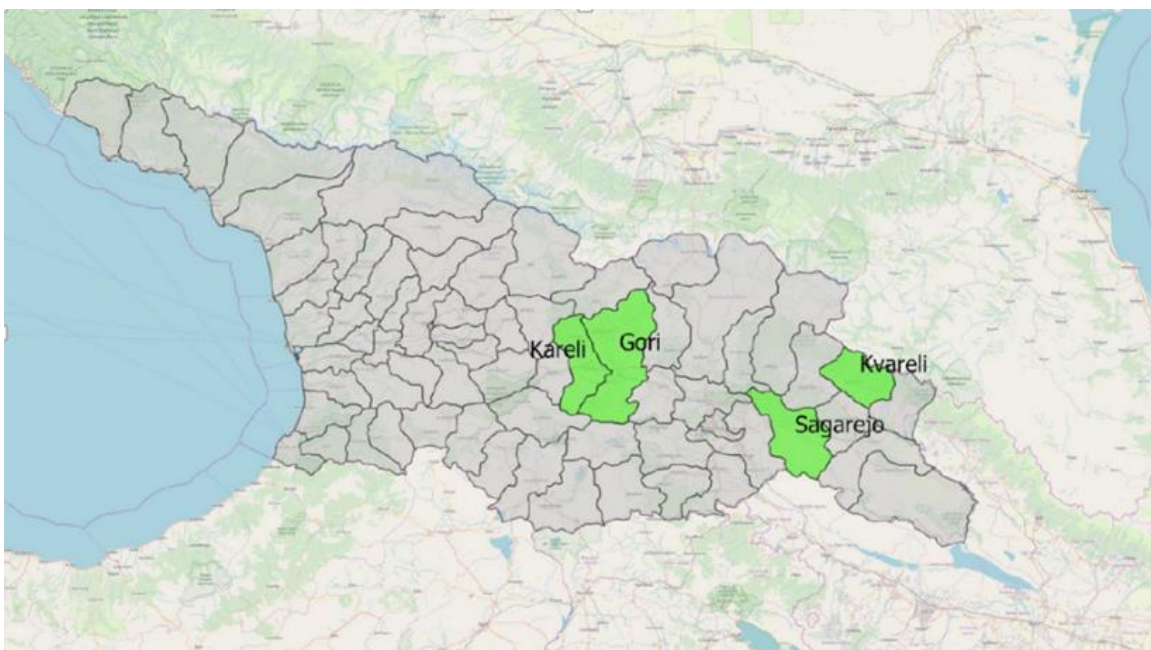
- Integrate LDN principles into national policies, strategies and planning documentations
- By 2030 about 1,500 ha of degraded forests will be reforested, about 7,500 ha will be afforested, and 60 % of forests will be managed sustainably
- By 2030, protected areas coverage should reach 12 %
- Degraded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

In response to the above mentioned problem, in 2018, the Ministry of Environmental Protection and Agriculture of Georgia (MEPA), in cooperation with UNEP and the Regional Environmental Centre for the Caucasus (REC Caucasus) initiated the Project “Generating Economic and Environmental Benefits from Sustainable Land Management (SLM) for Vulnerable Rural Communities of Georgia (GEF 6)” supported by the Global Environmental Facility (GEF).

The project’s objective is to develop and strengthen Sustainable Land Management (SLM) practices and build capacity for their application for the protection of natural capital in Georgia. The Project consists of the following three Project Components:

1. Creating an enabling environment at municipal scale for achieving Land Degradation Neutrality (LDN) Country Voluntary target;
2. Pilot implementation of measures avoiding degradation, intensifying sustainable land management practices and land rehabilitation to improve ecosystem functions and services;
3. Knowledge Management and Capacity Building.

One of the important action of the project that current report is devoted to is to develop LDN municipal strategies integrating all LDN target setting outcomes and gender equality municipal in SLM/LDN for 4 pilot municipalities (Gori, Kareli, Sagarejo and Kvareli). The map below shows the location of each municipality. The current report refers to the municipality of Kvareli.



Map 1: The four pilot municipalities of the project (in green) (Source: Ballesteros et al., 2020)

1.2. Geographical Location and Acreage

Kvareli municipality is located on the Eastern border of Georgia and has an area of 96,500 ha, which consists of 35 % grassland and arable land and 65 % forest land. In the North, the terrain rises to the main ridge of the Great Caucasus, on which the state border with Russia runs. The highest mountain in this area is Ninikas-fortress, 3117 m high. Most of the settlements are located at the foot of the mountain. The municipality is sparsely populated with 37,658 inhabitants. Agriculture in Kvareli municipality is mainly viticulture.

1.3. Key Aspects of Land Degradation

In Kvareli Municipality, key aspects of land degradation to be addressed are listed below

- Approximately 500 ha agricultural land is degraded due to waterlogging;
- Up to 10,000 ha of pastures and meadows are degraded due to overgrazing;
- About 1,000 ha of arable land is degraded due to impoverishment/depletion of soils.
- 60 ha of windbreaks has been left, whereas 300 ha of the territory was covered by windbreaks 30 years ago.

As a follow-up to the national target setting process, a municipal LDN working group that was established in Kvareli identified following main priorities that should be addressed:

- Restoration of windbreaks;
- Prevention of further erosion of pasturelands, to determine the amount of livestock which is allowed for specific pastures, introduction of pasturelands rotation;
- Restoration of degraded pasturelands

2. Vision and Objectives of the Strategy

2.1. Vision

Kvareli municipality LDN strategic vision implies that **by the 2030, the LDN is achieved at municipal level when the quantity and quality of land-based natural capital is stable or increasing, despite the impacts of environmental change.**

LDN Municipal Targets that are described in the next section of the Strategy support this vision.

2.2. Municipal LDN Targets Setting

2.2.1. Setting the Land Degradation Neutrality Baseline

The Framework and Guiding Principles for a Land Degradation Indicator defines three sub-indicators that are identified as suitable metrics to monitor and evaluate land degradation in the context of LDN at sub-national levels. The three principal and other sub-indicators are presented in the sections below:

2.2.2. Land Productivity - Baseline

To determine land primary productivity two indicators are used that can be directly derived using only remote sensing data: the Normalized Difference Vegetation Index (NDVI) and Fraction of Photo synthetically Active Radiations (fPAR). The mean NDVI index has been estimated at municipality level. The table below shows the mean seasonality values of the NDVI of target municipalities for current situation, while the map below shows the visual representation of the values. High values indicate healthy vegetation, whereas low values indicate no or dead vegetation.

Table 1: Averaged seasonal NDVI index computed per target municipality (Ballesteros et al. 2020)

Municipality/season	Kvareli
Winter	0.059
Spring	0.770
Summer (dif Spring – Summer)	0.668 (-13.2%)



Map 2: Spatial distribution of the NDVI values of target municipality (Ballesteros et al. 2020).

2.2.3. Land Cover and Land Cover Change

Land cover is the observed cover of the Earth's surface and the classification of this cover into different categories. It also describes the use of resources for human activities. Land cover is important in assessing land degradation because it provides a good information about the distribution of ecosystems (principally vegetated areas) and their fragmentation. To estimate the Land use and land cover, it was used a supervised classification by means of a maximum likelihood algorithm, using the selected Landsat imagery.

The table below shows the surface (km²) for each land cover at target municipality.

Table 2: Land cover units (in km²) for target municipality. Current situation. (Ballesteros et al. 2020).

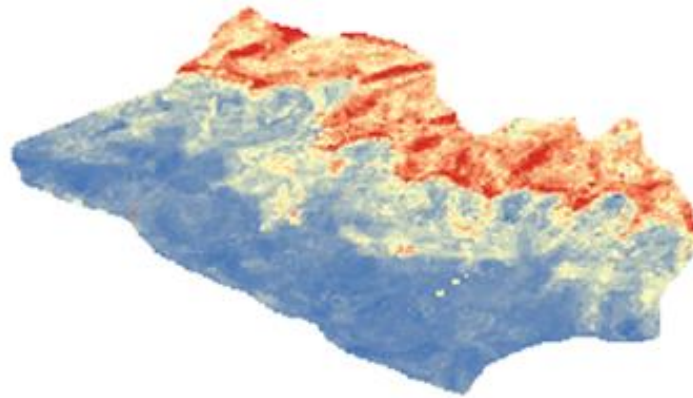
Municipalities/Landuse	Kvareli (km ²)
cropland	241.7
tree cover	616.7
shrub land	67.5
urban areas	12.6
bare soil	1.5
water	0.4

2.2.4. Carbon Stocks Above Ground

Soil organic content - The concentration of organic matter in the soils is another critical parameter of productivity and therefore an important indicator of land degradation. To estimate the soil organic content, it has been used a global product. SoilGrids uses state-of-the-art machine learning methods to map the spatial distribution of soil properties across the globe. Below it is briefly presented the main results and analysis on the soil organic carbon (SOC) content in the target municipality. The table below shows a summary of the main soil organic content [g/kg] at different soil depths. In general, organic carbon content is higher in forested parts than in more urbanized parts of the municipalities, as it is displayed in the map below.

Table 3: Summary of the main soil organic content [g/kg] at different soil depths for target municipalities. Changes in soil organic content for period 2001-2015. (Ballesteros et al. 2020).

Municipality/ Soil organic carbon content [g/kg]	Kvareli (km ²)
Mean content at 0.05 m depth	47,6057
Mean content at 0.30 m depth	Not available
Mean content at 1.00 m depth	13,1630
Mean changes in time (2001-2015) between 0 and 30 cm depth	0,0021

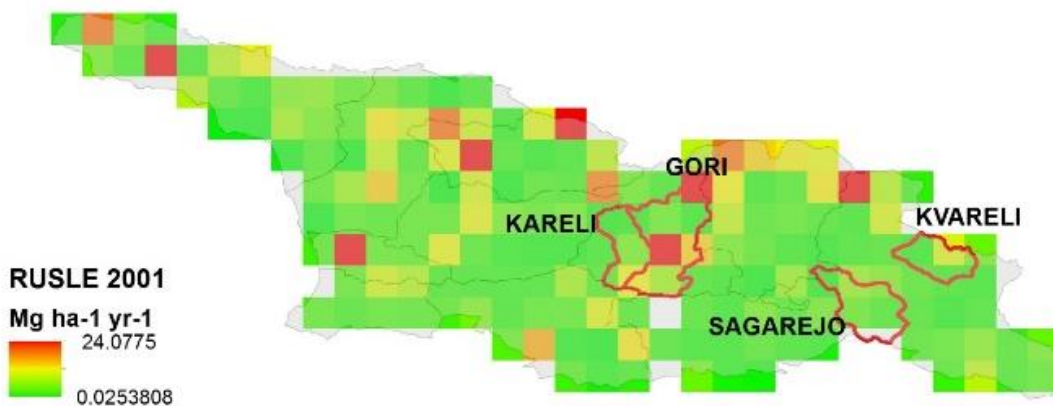


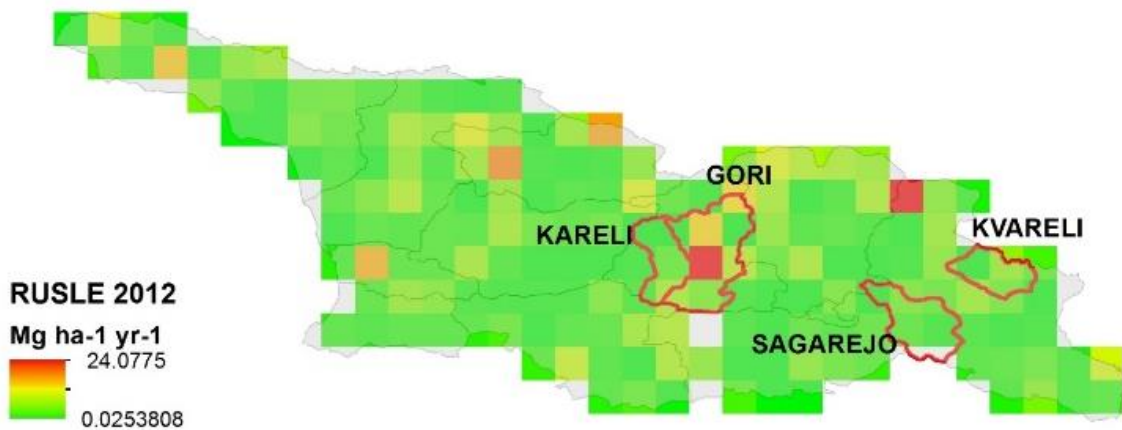
Map 3: Example of the spatial representation of the soil organic content evaluated at 0.05m for target municipality (Ballesteros et al. 2020)

2.2.5. Soil Erosion

In addition to the three principal sub-indicators of LDN, it can be important to consider also soil erosion to assess land degradation. Particularly in Georgia where more than 1 million hectares of land are facing soil erosion, due to natural (water, wind erosion) or anthropogenic (e.g. unsustainable land management) factors.

To evaluate the soil losses, it was used the global dataset that includes soil losses information for 2001 and 2012 at 25km pixel resolution. The approach uses remote sensing information to determine long-term annual soil erosion rates using an improved large-scale Geographic Information System (GIS) and the Revised Universal Soil Loss Equation (RUSLE) model. The below shows the changes in soil losses between the reference period and current situation.





Map 4: Soil loses based on global scale RUSLE model for Georgia (25 x 25 km) for 2001 (up panel) and 2012 (down panel). (Ballesteros et al. 2020).

As mentioned in the definition of land degradation, the analysis of driving factors for soil erosion should not be limited to “land-based” factors since it has to do with a combination of processes. Therefore, it have to be also considered climate trends (mean trends as well as extreme trends) and socio-economic indicators. These two additional types of indicators will provide a good general idea about all the factors that can lead to soil degradation.

2.2.6. Climate Trends

The impact of climate on soil erosion is indubitable, principally by the effect of precipitations. So, it is essential to take into account the climate factor when assessing all the factors leading to land degradation. Then, in order to characterize this factor, weather reanalysis is looked at (in particular ERA-5 reanalysis) and open-access data of Regional Climate Models (RCM). This allows to determine mean trends at a monthly to annually scale and also the extreme trends. It is important to consider both mean and extreme trends in the context of climate since the two play an important role in the occurrence of degradation. The climatic variables analyzed are essentially temperature and precipitation because they influence all the other climatic parameters and are determinant for soil erosion.

The figures below it is presented respectively significant changes in temperature and precipitation for target municipality. From the multi-temporal trend analysis, it is quite obvious that the temperature has increase significantly since 1979. It is also obvious that the annual precipitation rate has decrease, with significant values if ones consider the entire temporal length. An increase in temperature and decrease in precipitation could affect the land degradation.

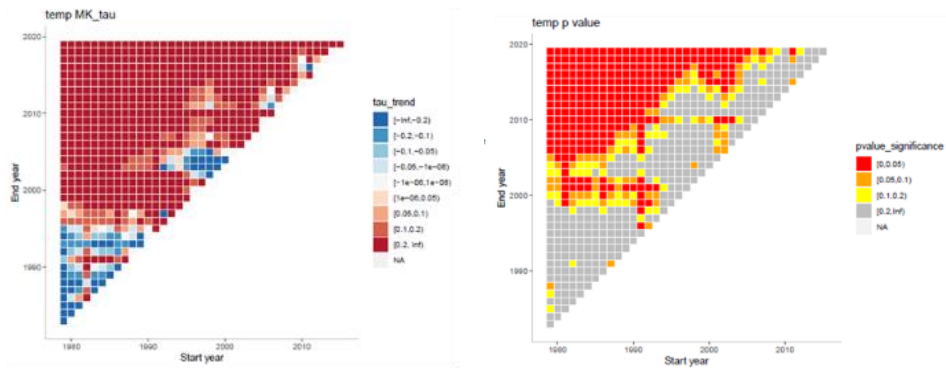


Figure 1: Multitemporal (5 year) trend analysis of the annual temperature at municipality scale. Up statistic parameter (tau-values), down p-value

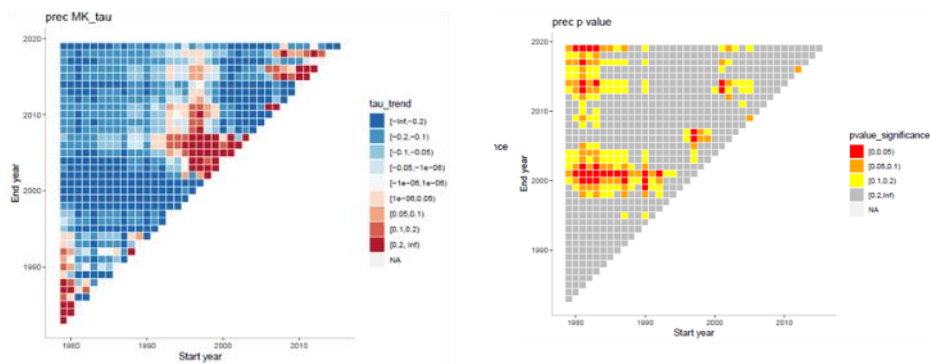


Figure 2: Multitemporal (5 year) trend analysis of the precipitation at municipality scale. Up statistic parameter (tau-values), down p-value.

Climate Scenarios

As climate play an important role in land degradation (according with the results obtained that is presented above), it was needed to see what in the future is expected. Overall, in the studied region, it is expected an increase of temperature for 2100 from 2-4.3°C, while the precipitation rates is not expected to change, or a slightly will decrease. It is clear that soil moisture will decrease, which may have strong impact on biomass production.

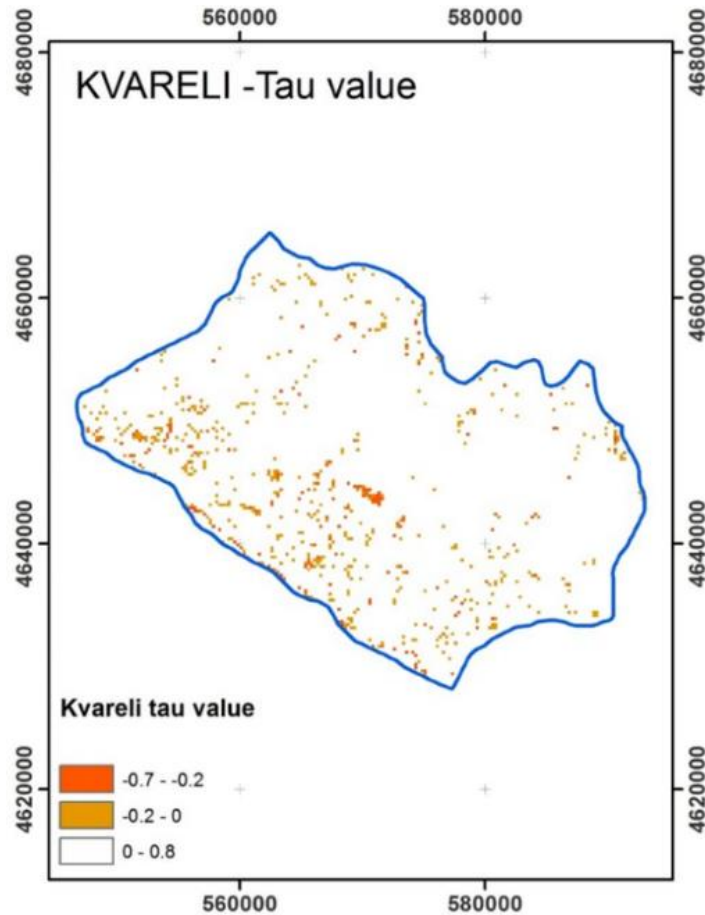
2.2.7. Socio-Economic Data

In order to reflect the impact of society on the land use and assess the link with the degradation of soils, it is important to take into account socio-economic factors. These factors can be represented by a list of indicators derived from a series of parameters. The different socio-economic indicators/data used to reflect the impact of society on land are provided at municipality level from local authorities are:

- Demography – (Evolution of the population, Rate of natural increase, Age distribution for urban and rural areas of different municipalities)
- Rural/urban population
- Size of the households
- Health limitations
- Occupation (Type of economic activity, Business sector)
- Wealth/Income (Poverty, Type of ownership of dwelling, type of housing, Salary)
- Education (Access to the internet, Illiteracy rate)
- Land use (Land use in agriculture, usage of fertilizers, usage of pesticides)

2.3. Summary of Municipal Vulnerability Profile

Based on the analysis of the data provided in the previous sections the land degradation vulnerability profile of the target municipality were produced that is presented below.



Map 5: Susceptibility to degradation of target municipality (Ballesteros et al. 2020)

2.4. Land Degradation Trends

Summarized current developments of trend and their influence on LDN indicators is presented in the table below, the next table presents LDN Baseline values for target municipality and general targets.

Table 4: Development trends and their influence on LDN indicators (Ballesteros et al. 2020)

Type	Indicator	Explanation	Trend
Land productivity	NDVI	Negative trend over the last 15 years	-2
Land use	cropland	rate of change was -0.6%	-2
	tree cover	the rate of tree cover (0.4%)	3
	shrub land	positive trends (~0.4%)	3
	urban areas	increase in urban area (0.78%)	3
	bare soil	no trends	null
Soil organic carbon	organic material	slight increase (0.002)	1
Soil erosion	soil losses	Slightly positive trend	1

Climate	temperature	significant positive increase of temperature	-3
	precipitation	significant decrease of precipitation	-3
Socioeconomic	Demographic development	Neutral	1
	Population density	Low	0
	Rural/urban types of housing (individuals)	Rural population low	3 1
	% of agricultural land	Medium share of agricultural land	2
	Evolution of fertilizers	Nitrogenous fertilizer use increasing	2
	total area (in sq. km) covered by annual crops	Higher annual crop lands (in km2)	3
	business dynamics	Neutral-increasing	1

Table 5: LDN Baseline values for target municipalities and general targets

LDN Global Vision	LDN indicator	Baseline	Kvareli	
			Value	General target
Zero Net-loss of productive land by 2030	Land cover change	Forests in non-agricultural areas [ha]	13,077	increase
		Forests in agricultural/plain area [ha]	34,946	increase
		Cropland [ha]	23,839	increase
		Grassland, shrubs [ha]	21,055	maintain
		Urban areas [ha]	1,057	maintain
		Wetlands[ha]	92	increase
		Bare land [ha]	172	decrease
	Carbon storage	Mean content at 0.05 m depth [g/kg]	47.606	increase
		Mean content at 0.30 m depth [g/kg]	no data	no data
		Mean content at 1.00 m depth [g/kg]	13.163	increase
	Land productivity	Winter [NDVI]	0.059	increase
		Spring [NDVI]	0.77	
		Summer [NDVI]	0.668	
	Soil erosion	Wind erosion (very high) [ha]	52	maintain
		Water erosion (moderate-very high) [ha]	410	decrease
Salinization (high-very high) [ha]		0	maintain	

2.5. Drivers of Land Degradation

Land degradation in the target Municipality has a wide range of different causes. The main causes for land degradation is presented below.

Direct drivers of land degradation:

- Degradation of soil productivity due to unsustainable agricultural practice and deficient irrigation systems
- Wind erosion by absence of windbreaks
- Loss of natural vegetation and soil erosion caused by overgrazing
- Degradation of forest areas by improper forest management, deforestation and illegal extraction
- Climate change

Indirect drivers of land degradation

- Inadequate baseline information, policies, plans and regulations and financing mechanisms
- Low institutional capacities and weak governance at municipal level
- Low awareness and lack of knowledge amongst land users
- Land tenure and land registration
- Low investment
- Limited experience and absence of identified best practices for sustainable land management interventions

2.6. Defining Municipal Voluntary Land Degradation Neutrality Targets

Based on the analysis of collected data, documents created within the project and based on the number of workshops and consultations with relevant stakeholders, LDN working group the following LDN Municipal targets were defined per target municipality that is presented on the table below:

Table 6: LDN Municipal targets/sub-targets

LDN Municipal target	Sub-target/Indicator
O1: Ongoing implementation of a landscape-based land-use planning approach	1.1. ILUP as basis for regional planning approved and implemented
	1.2. Adequate capacities at the municipal Spatial Planning and Infrastructure Department in place
O2: Maintain the protected area coverage	2.1. The special conservation area is recognized as protected area in Georgia
O3: Restoration of degraded agricultural land	3.1. Wind erosion mainly on reduced
	3.2. Degraded pastures restored
	3.3. Soil erosion along rivers and on pastures reduced
	3.4. Soil salinization risk reduced
O4: Increase and maintain land productivity on agricultural land by introduction of SLM practices	4.1. Area covered by perennials and/or Agro-Forestry increased
	4.2. Sustainable farming practices promoted
	4.3. Agro-ecological subsidy/incentive scheme established
	4.4. Pasture management on grassland improved
O5: Enhance capacities for agricultural development based on SLM principles and ILUP recommendations	5.1. Capacities of farmers for the implementation of SLM practices enhanced
	5.2. Capacities of agricultural extension offices/experts enhanced to inform about SLM practices

O6: Improvement of agricultural productivity through efficient irrigation infrastructure and practice

6.1. Efficient irrigation systems in place

6.2. Irrigation practice improved

2.7. LDN Transformative Projects and Programmes Results Framework

As a kind of a hierarchical LDN response chain, the Result Framework (see table below) brings the existing indicators, target systems and analysis into a logical connection with the LDN implementation indicators, targets and measures on municipal level. It has to be stated, that some indicators cannot be specified, partly because they are not available or do have a weak data basis. However, it was tried to deduce and estimate some of the indicators/targets from the various sources. Thus, it is to be seen as a first step of approximation, providing a first structure and some quantified indications for further discussion.

Table 7: LDN Transformative Projects and Programmes (TPP): Results framework

Official municipal LDN targets	Proposed municipal LDN target	Proposed sub-target/Indicator	Baseline	Potential Target 2030	Avoid	Reduce	Reverse
Not available	O1: Ongoing implementation of a landscape based land-use planning approach	1.1. ILUP as basis for regional planning approved and implemented 1.2. Adequate capacities at the municipal Spatial Planning and Infrastructure Department in place	0 0 staff trained	1 3 permanent staff trained and in place			
Not available	<i>no data and no focus, but given the large forest share, targets should be considered.</i>	<i>none</i>					
Not available	O2: Maintain the protected area coverage	2.1. The special conservation area is recognized as protected area in Georgia.	27.5% (SCA)	27.5 (SCA) %			
Not available	O3: Restoration of degraded agricultural land	3.1. Wind erosion mainly on cropland and partly grassland reduced 3.2. Degraded pastures restored 3.3. Soil erosion along rivers and on pastures reduced 3.4. Soil salinization risk reduced	52 ha at risk not specified/ not known 410 ha at risk not an urgent issue at the moment	0 ha at risk (e.g. through 2 km of windbreaks) not an urgent issue at the moment 5 km along Alazani river and 25 km along small tributaries restored 50 ha of severely degraded pastures (e.g. gullies) restored not applicable			
Not available	O4: Increase and maintain land productivity on agricultural land by introduction of SLM practices	4.1. Area covered by perennials and/or Agro-Forestry increased 4.2. Sustainable farming practices promoted 4.3. Agro-ecological subsidy/incentive scheme established 4.4. Pasture management on degraded grassland improved	6,223 ha not specified/ not known (7,000 ha annual crops; 4,500 ha of vineyards) 0 beneficiaries at the moment (assumption) Estimate: 10,000 ha degraded*	7,000 ha (roughly additional 800 ha necessary) additional 5,000 ha managed sustainably (focus on annual crops and vineyards) 500 beneficiaries 3,000 ha improved			
Not available	O5: Enhance capacities for agricultural development based on SLM principles and ILUP recommendations	5.1. Capacities of farmers for the implementation of SLM practices enhanced 5.2. Capacities of agricultural extension offices/experts enhanced to inform about SLM practices	not specified/ not known not specified/ not known	500 farmers trained 3 agricultural extension officers (ARDA) trained			
Not available	O6: Improvement of agricultural productivity through efficient irrigation infrastructure and practice	6.1. Efficient irrigation systems in place 6.2. Irrigation practice improved (with a focus on waterlogged areas)	2,957 ha functional (acc. Agrocensus 2016) not specified/ not known 500 ha degraded due to waterlogging	7,484 ha (additional 4,527 ha - irrigable land) 3,000 ha (100% of current) irrigated sustainably 0 ha degraded due to waterlogging			

2.8. LDN Municipal Strategy Objectives/Targets and Subtargets

The LDN Municipal Strategy objectives/targets and subtargets are in detail presented below:

Objective 1: Ongoing implementation of a landscape based land-use planning approach

- 1.1.: ILUP as basis for regional planning approved and implemented: Integration of the ILUP⁵ into regional planning and agricultural priority area zonation. Any reduction should be compensated by an equally sized gain.
 - Official adoption of the ILUP
 - Definition of non-development zones (Ecological priority zones, functional zoning according to suitability and vulnerability)
 - Implementation of the measures as proposed in the ILUP
- 1.2.: Adequate capacities at the municipal Spatial Planning and Infrastructure Department in place:
 - Training on spatial planning and land use planning for municipal staff
 - Ensuring a fixed budget for a minimum number of spatial planning staff
 - Provision of necessary technical infrastructure (e.g. GIS, computers)
 - Further implementation of LDN working groups

Objective 2: Increase the protected area coverage

- 2.1.: Protected Areas as compensation for urbanization/soil sealing established
 - Initiation of a feasibility study on the options and potentials of a protected area around the Special Conservation Area (e.g., nature reserves) including model regions for sustainable development (Biosphere Reserve, Regional Parks)
 - Definition of non-development zones (Ecological priority zones)
 - Determination of the appropriate (soft) conservation regime (e.g. municipal protected area/multiple use areas; nature park)
 - Establishment of special conservation programs for rare species, keystone species, domesticated species, and Crop Wild Relatives (CWR)

Objective 3: Restoration of degraded agricultural land

- 3.1.: Wind erosion on cropland reduced
 - Definition of priority areas and elaboration of a detailed restoration plan at the focus area around Gremi. As wind erosion is a less prominent topic in Kvareli, the multifunctional benefits (e.g. soil fertility, humidity, biodiversity) should be emphasized (and for instance be combined with bee hives)
 - Establishment of 2 km (1ha) of multifunctional windbreaks
 - Create awareness amongst land users
 - Elaborate a (legally valid) solution for ownership of windbreaks and burning of windbreaks
 - Elaborate the concept of multifunctional windbreaks with multiple benefits (e.g. Agroforestry systems)
 - In addition, 150 ha of landscape elements could be establish fulfilling similar functions as wind breaks (e.g. on large fields South-west of Gremi)

⁵ Integrated Land Used Plan (ILUP) developed within the project

- Provide financial incentives for the establishment of elements as defined in the ILUP Kvareli
- 3.2.: Degraded pastures restored
 - Probably not an urgent issue for the municipality at the moment
- 3.3.: Soil erosion along rivers and streams and on pastures reduced
 - Definition of priority areas and elaboration of a detailed restoration plan (e.g. which river stretches of Alazani river; prioritized small streams at the foot of the Caucasus, rivers at the south-western edge of the municipality)
 - Protection and restoration of eroding stream banks and pastures affected by soil erosion with bioengineering techniques using local resources (vegetation, willow fascines, rocks)
 - Exchange visit with Tusheti, where bioengineering measures on slopes were implemented during the IBIS/IEC project.
 - Establishment of buffer zones with a gradient of decreasing agricultural intensity as you approach streams or wetlands (riparian area – transition from an aquatic to a terrestrial ecosystem)
 - Maintaining sufficient distance of cultivation to allow rivers to flow freely and retain flood retention areas (natural flood control); keeping corridors clear for runoff water (green and blue infrastructures), fallow fields can be flooded
 - Provision of special incentives for organic farming or at least integrative pest management in buffer zones to reduce eutrophication of water bodies
 - Preference to extensive, resilient grassland in combination with a mosaic of water-related landscape elements (riparian forests, ruderal sites, oxbow lakes) over intensive cropping or perennial cultivation along rivers for natural erosion control
- 3.4.: Soil salinization risk reduced:
 - Probably not an urgent measure for the municipality

Objective 4: Increase and maintain land productivity on agricultural land by introduction of SLM practices

- 4.1.: Area covered by perennials and/or Agro-Forestry increased
 - Definition of priority areas and elaboration of detailed implementation plans
 - Promotion of value chains for perennial products
 - Information campaign for (economic) potentials and benefits of perennials
 - Introduction agro-silvicultural systems on cropland with focus on HPV farmland with low degree of landscape elements and affected by potential wind erosion (e.g. HNv 1; WE 1)
 - Establish agrosilvipastoral systems on grassland on about 800 ha at the lower slopes of the Caucasus beyond the tree line
- 4.2.: Sustainable farming practices promoted
 - Definition of priority areas and elaboration of detailed implementation plan
 - Establishment of at least 6 demonstration plots with committed farmers/farmer groups (Early adopters) for 1. Mixed-farming systems (especially in combination with grassland and cropland to improve C, N and P cycle closure and farm resilience); 2. Organic farming on vineyards and cropland; 3. Multi-functional windbreaks; 4. Agroforestry; 5. Crop-rotation and intercropping; 6. Smart irrigation (rainfed crop varieties, drip irrigation etc.)
 - Organization of farmer exchange visits with farmers of the pilot plots

- Organize an annual small idea competition for SLM and selection one farmer of the year (portrait of successful adopters) chaired by the local LDN group
- 4.3.: Agro-ecological subsidy/incentive scheme established
 - Development of concept and funding mechanism to establish a agro-ecological subsidy scheme based on the experiences of the demonstration plots and in line with the ILUP Kvareli available for all farmers in Kvareli (could be also targeted at Kakheti regional level).
- 4.4.: Pasture management on degraded grassland improved
 - Elaboration and implementation of pasture management plans based on existing carrying capacities and rotational grazing.
 - Promotion of hay-making to provide additional fodder and to reduce pressure on pastures on selected pilot sites particularly around villages which focus in intensive grazing in forests during winter.
 - Improvement of pasture quality around villages (e.g. by removal of pasture weeds, rotational grazing) and improvement of mechanical weed control, cutting (too much) shrubs for improved productivity
 - Exchange visit with pastoralists in Tusheti with a focus on rotational grazing and electric fencing.
 - Pilot testing of mixed farming systems
 - Mixed grazing with different species of animals for efficient use of biomass
 - Appropriate mowing techniques, equipment, and timing
 - Reduction of bare ground or close steppe vegetation, by reseeding, protecting trampled areas, natural renovation of swards

Objective 5: Enhance capacities for agricultural development based on SLM principles

- 5.1.: Capacities of farmers for the implementation of SLM practices enhanced
 - Carry out a series of field trainings for farmers regarding the implementation of SLM practices
- 5.2.: Capacities of agricultural extension offices (ARDA) enhanced to inform about SLM practices
 - Carry out trainings for agricultural advisors (ARDA) on benefits and technological aspects of different SLM practices
 - Carry out trainings for agricultural advisors on existing subsidies, incentives and service providers or suppliers
 - Elaboration of a manual for agricultural advisors on SLM practices

Objective 6: Improvement of agricultural productivity through efficient irrigation infrastructure and practice

- 6.1.: Efficient irrigation systems in place: Adaptation and restoration of the irrigation systems in cooperation with the National Amelioration Company based on an adapted irrigation concept.
 - Development of an irrigation concept based on irrigation needs, water availability, required investments for restoration considering new irrigation technology and a potential shift towards more rainfed varieties
 - Restoration of the irrigation system according to the concept
- 6.2.: Irrigation practice improved

- Mapping of agricultural land affected by waterlogging and development of a set of measures to improve irrigation practice
- Establishment of a network of sites for new irrigation technology, new rainfed varieties including training and information campaign

3. Gender Equality Considerations at Municipal Level in light of LDN

3.1. Gender Roles, Gaps and Opportunities

Gender analysis at municipal level (as well as the recommendations obtained from the field visits, awareness-raising workshops, and the consultation process with various stakeholders) was resulted in elaboration of the Municipal Gender Action Plan (GAP) that was based on identified gender roles, gaps and opportunities. The transformative potential of addressing these gender gaps and more effectively engaging women stems not only from the opportunity to engage more people in environmental efforts in terms of absolute numbers, but also from (i) the inclusion of unique skills, knowledge, and experiences of women, including their roles as primary users and stewards of many natural resources; and (ii) supporting women's roles to change the causal chain of environmental degradation from their involvement in governance and the public and private sectors, to their choices as consumers in the global market, to investment choices.

The GAP includes components in order to monitor the entire change process that will lead to the achievement of the proposed goals. In addition, the goals are accompanied with indicators that have both a quantitative and qualitative nature. The indicators function as vital particulars for the monitoring process. A column based on gaps addressed by the actions can function a baseline for the monitoring process as well. Finally, the Plan includes the institutions that are expected to lead the implementation of the actions, together with strategic partners. The actions are harmonized with the policies, programs, and operational plans of each institution. The goals, expected outcomes, and actions included in the GAP are proposed to reduce specific gender gaps identified during the gender analysis.

The project activities will contribute directly and indirectly towards improving the condition of women by enhancing their capacity to participate in decision-making processes, and to engage in project activities that have the potential to improve their economic situation. Women will benefit particularly from skill development (education/training) and improved access to knowledge on agrobiodiversity, which will contribute increasing both the incomes and social capital of women.

A gender mainstreaming approach will be best undertaken towards integrated land degradation considerations into overall biodiversity, agriculture, and agro-tourism policies. Planning goals and their concrete application and implementation will be evaluated in terms of specific criteria. Expected gender study under the project will include gender-mainstreaming recommendations to ensure that gender considerations are properly considered with view of national gender equality legislation⁶ and existing nationwide gender equality barriers and obstacles⁷.

⁶ Gender Equality Act (2010) / Law of Georgia on Gender Equality of 26 March, 2010 (*Official Gazette of Georgia – Legislative Herald of Georgia (LHG)*, web-page: matsne.gov.ge, Ref.: 2844-Is, Registration Code No. 010.100.000.05.001.003.962/ Consolidated Version as of 19.02.2019 as modified by 8 amending Laws) - [Unofficial Translation in English]
<https://matsne.gov.ge/en/document/view/91624>

⁷ Gender Equality in Georgia: Barriers and Recommendations (2018). Parliament of Georgia.
http://www.ge.undp.org/content/georgia/en/home/library/democratic_governance/gender-equality-in-georgia.html

3.2. The Gender Action Plan

Component 1	Creating an enabling environment at municipal scale for achieving Land Degradation Neutrality (LDN) Country Voluntary target			
Expected Outcome	Actions	Indicator	GAP addressed	Responsibility
1.1. Projects that create sustainable economic opportunities for women and men and strengthen the conservation and sustainable management of forests within environmental institutions	1.1 Analyze existing relevant national and local policies and identify gaps in protection and sustainable use of land resources provided by local agrobiodiversity, gender equality etc.	At least two policy documents addressing sustainable use of agricultural biodiversity will include gender-specific needs and ways to address them	Unequal access to and control of natural resources	RECC Project team and experts Municipalities of Kvareli region
	1.2. Develop policy proposals on integrating appropriate land resource usage in existing national and local policies on agriculture and other relevant sectors ensuring their gender responsiveness.	Percentage of women involved in committees and organized groups related to the protection and conservation of Land resources Number of projects and training processes in which the network provided technical support to include a gender perspective	Uneven participation and decision making in environmental planning and governance at all levels	
1.2 Process for strengthening restoration programs to incorporate a gender perspective	1.3 Organize round tables with participation of regional/local government agencies and non-governmental organizations working in agriculture, environment protection, rural development sectors with participation of female representatives to discuss findings of regulatory framework study and gender analysis	Number of special rooms created for women for structural decision making		

Component 2	Pilot implementation of measures avoiding degradation, intensifying sustainable land management practices and land rehabilitation to improve ecosystem functions and services			
Expected Outcome	Actions	Indicator	GAP addressed	Responsibility
2.1 Process for strengthening restoration programs to incorporate a gender perspective	2.1 Develop methodology of study on avoiding degradation, intensifying sustainable land management practices and land rehabilitation and ensure that it includes gender lens to analyze specific gender-related needs and roles in sustainable application of these practices.	At least 50% of farmers and local community representatives to participate in the capacity-development trainings are women;	Unequal access to and control of natural resources	RECC Project team and experts Municipalities of Kvareli
	2.2 Develop gender-responsive guidelines on sustainable management and harvesting of priority plant species and products and make them available to local communities and extension workers, with special attention on younger generation learning about farming.	At least 50% of farmers and local stakeholders benefitting from increased resources and improved marketing opportunities are women		
	2.3 Establish a mechanism to improve relations between women and men, and break gender stereotypes through conflict resolution workshops.	A number of women to participate in knowledge-based activities related to technical knowledge about farming		
GOAL 3	Knowledge Management and Capacity Building			
Expected Outcome	Actions	Indicator	GAP addressed	Responsibility
3.1 Increased availability of gender responsive technical knowledge about	3.1 Ensure equal participation of men and women in the “on the job trainings” on agricultural land resource farming and	Content of awareness raising campaigns are oriented on breaking stereotypes on		RECC

land resource and capacity building in the municipality of Kvareli	practices	conventional gender roles and reinforcing women's image as change-makers	Imbalanced access to socio-economic services.	Project team and experts Municipalities of Kvareli
	3.2 Ensure that content of the awareness-raising materials reflects women's and men's gender roles, gender stereotypes and their impact on the society specifically relating to the Kvareli region	Number of gender equality programs and projects that address environmental issues		
	3.3 Implement the processes of induction and capacity building of internal and external bodies in a gender-responsive manner, in order to increase women's accreditation in farming	Percentage of women producers benefited by environmental financing mechanisms Percentage of women who receive information on funding.		
	3.4 Mobilize and encourage local women to participate in the project activities, specifically in the capacity building trainings			

3.3. Implementation, Monitoring and Evaluation

A variety of policy measures, instruments, and incentives will be required to guarantee the effective implementation of GAP which is part of the project: “Generating Economic and Environmental Benefits from Sustainable Land Management for Vulnerable Rural Communities of Georgia” Several relevant tools and mechanisms identified through consultations with stakeholders are briefly described below for gender-responsive activities:

3.4. Capacity Building

Capacity building a necessary step toward implementation of the aforesaid actions as it functions as a conceptual approach to social or personal development. Capacity building focuses on understanding the obstacles that inhibit people, Governments, international organizations, and non- governmental organizations from realizing their development goals while enhancing the abilities that will allow them to achieve measurable and sustainable results. For the current GAP, capacity building involves three enabling conditions necessary to implement gender-responsive environmental initiatives: (a) institutional capacities, political will, and support platforms; (b) organized women’s groups working in agro-ecosystems and local community involvement; and (c) gender experts with technical capacities to support the design, implementation, and monitoring of gender-responsive activities.

3.5. Legislation and Regulation

Applicable legislation and associated regulatory requirements set by MEPA and the Municipalities will be essential for guiding the execution of Gender Action Plan. It is vital to note that many well-designed legislation and regulations remain ineffective because of lack of a bridge existing between biodiversity and gender equality, thus implementation and enforcement of these rules will be crucial. Moreover, the basis for all successful function of legislation operations lies in the willingness of citizens to follow good practices and maintain the discipline to do so consistently.

3.6. Finance and Human Resources

The use of financial instruments is central for refining the effectiveness of gender-responsive results. Appropriate budgeting is necessary for all areas of the action plan, may that be administrative, legal, technology-based, and project based. Financing that is dedicated to gender equality and women’s empowerment as a main objective is rare. For this project, dedicated financing should target areas with greatest need and where other financing is not as effective. This includes support for women’s voice and agency, and reaching those women and men, girls and boys that are the most at risk of being left behind. Standards need to be more consistently applied and developed for new forms of financing.

3.7. Awareness-raising

The public must be educated and encouraged to practice more actions that are for gender responsive results. The gender equality gaps in Georgia highlighted in global and regional indexes reflect a situation where women’s roles, opportunities, and rights are often constrained by conservative sociocultural norms and gender stereotypes. Therefore, awareness should be raised concerning gender-stereotypes that effect women’s’ rights with the involvement of the local community.

3.8. Monitoring and Performance Assessment

Lastly, the implementation of Kvareli’s Gender Action Plan should be monitored continuously, with progress and performance assessed against its specified targets and actions. By monitoring the targets and actions it is possible to classify a known starting point, stipulating the opportunity of establishing whether projected milestones have been achieved. However, obtaining reliable gender-related data is difficult, hence stands as one of the most challenging aspects. Consequently, proper data collection and information sharing is, therefore, a key element of gender mainstreaming.

4. Implementation Plan/Leverage Plan (Outline of Targets, Related Costs and Funding Sources) of LDN Municipal Strategy

Proposed municipal LDN target	Proposed sub-target/Indicator	Baseline	Potential Target 2030	Activities	Costs (range)	Potential funding sources
O1: Ongoing implementation of a landscape based land-use planning approach	1.1. ILUP as basis for regional planning approved and implemented	0	1	General activity: Adoption of the ILUP		
	1.2. Adequate capacities at the municipal Spatial Planning and Infrastructure Department in place	0 staff trained	3 permanent staff trained and in place	Training: Training for municipal staff; Public spending: Fixed budget for spatial planning staff; Investment: Technical infrastructure (e.g. GIS, computers); General activity: LDN working groups	Remuneration according to public salary scheme; 5,000-10,000 for equipment; 2,000-7,000 for trainings	Public funding
O2: Maintain the protected area coverage	2.1. The special conservation area is recognized as protected area in Georgia.	27.5% (SCA)	27.5 (SCA) %	Study: Feasibility study on the options to officially recognize SCAs as conservation area and related management scenarios	20,000 USD	International funding (part of a larger programme)

O3: Restoration of degraded agricultural land	3.1. Wind erosion mainly on cropland and partly grassland reduced	52 ha at risk	0 ha at risk (e.g. through 2 km of windbreaks)	Pilot measure: Establishment of 2km (1 ha) of windbreaks; General activity: Awareness raising campaign; Grant giving activity: Provide financial incentives for establishing 150 ha of landscape elements	5,000-75,000 USD	International funding (part of a larger programme); Tree nursery as public- private partnership (investment)
	3.2. Degraded pastures restored	not specified/ not known	not an urgent issue at the moment			
	3.3. Soil erosion along rivers and on pastures reduced	410 ha at risk	5 km along Alazani river and 25 km along small tributaries restored	Study: Elaboration of a detailed restoration plan along Alazani river and tributaries; Pilot measure: 25 Bioengineering measures on river bank; Investment: Tree nursery for producing windbreak materials or national company specialized in bioengineering; General activity: Establishment of buffer zones along rivers and wetlands; Implementation of ILUP recommendations; Grant-giving activity: Special incentives for organic farming or at least integrative pest management in buffer zones	50,000 - 250,000 USD	
			50 ha of severely degraded pastures (e.g. gullies) restored	Study: Elaboration of a detailed restoration plan for most degraded pastures; Pilot measure: 5 Bioengineering measures on river banks	10,000 - 50,000 USD	

	3.4. Soil salinization risk reduced	not an urgent issue at the moment	not applicable			
O4: Increase and maintain land productivity on agricultural land by introduction of SLM practices	4.1. Area covered by perennials and/or Agro-Forestry increased	6,223 ha	7,000 ha (roughly additional 800 ha necessary)	<p>General activity: Definition of priority areas and elaboration of detailed implementation plans;</p> <p>General activity: Information campaign for (economic) potentials, value chains and benefits of perennials;</p> <p>Pilot measure/grant-giving activity: Introduction agro-silvicultural systems on cropland (400 ha);</p> <p>Pilot measure/grant-giving activity: Establish agrosilvipastoral systems on grassland (400 ha)</p>	75,000-150,000 USD	International funding (part of a larger programme); potential for private sector investment (specific value chains)
	4.2. Sustainable farming practices promoted	not specified/ not known (7,000 ha annual crops; 4,500 ha of vineyards)	additional 5,000 ha managed sustainably (focus on annual crops and vineyards)	<p>Study: Definition of priority areas, type of supported practices (e.g. no tillage, crop-rotation) and selection criteria;</p> <p>Pilot measures: Establishment of 6 demonstration plots (1-2 pilot plots for each SLM practice);</p> <p>Investment: Materials for demonstration plots;</p> <p>Training: Organization of farmer exchange visits with farmers of the pilot plots;</p> <p>Grant-giving activity: Annual small idea competition for SLM (10 farmers supported/year)</p>	100,000-250,000 USD	International funding (part of a larger programme); potential for private sector investment (specific value chains)

	4.3. Agro-ecological subsidy/incentive scheme established	0 beneficiaries at the moment (assumption)	500 beneficiaries	<p>Study: Development of concept and funding mechanism to establish a agro-ecological subsidy scheme</p> <p>Grant-giving activity: Support of farmers as part via the criteria of the subsidy scheme</p>	80,000-300,000 USD	International funding (part of a larger programme) or part of a public subsidy scheme
	4.4. Pasture management on degraded grassland improved	Estimate: 10,000 ha degraded*	3,000 ha improved	<p>Study/Pilot activity: Elaboration and implementation of pasture management plans for 3,000 ha</p> <p>General activity: Information campaign on hay-making to provide additional fodder and to reduce pressure on pastures</p> <p>Training: Exchange visit with pastoralists in Tusheti with a focus on rotational grazing and electric fencing.</p> <p>Pilot activity: Pilot testing of mixed farming systems on 5 demonstration plots (in addition, restoration of mountain access roads)</p> <p>Grant-giving activity: Support 5-10 adopters per technology/practice technically and financially</p>	100,000 - 350,000 USD	International funding (part of a larger programme)
O5: Enhance capacities for agricultural development based on SLM principles	5.1. Capacities of farmers for the implementation of SLM practices enhanced	not specified/ not known	500 farmers trained	<p>Training: 20 two-day field trainings for farmers (group size 25)</p>	10,000-50,000 USD	International funding (part of a larger programme)

and ILUP recommendations	5.2. Capacities of agricultural extension offices/experts enhanced to inform about SLM practices	not specified/ not known	3 agricultural extension officers (ARDA) trained	Training: 2 trainings for agricultural advisors (ARDA); Study: Elaboration of a manual for agricultural advisors on SLM practices	5,000 - 20,000 USD	International funding (part of a larger programme)
O6: Improvement of agricultural productivity through efficient irrigation infrastructure and practice	6.1. Efficient irrigation systems in place	2.957 ha functional (acc. Agrocensus 2016)	7,484 ha (additional 4,527 ha - irrigable land)	Study: Development of an irrigation concept for 4,527ha; Pilot measure: Restoration of the irrigation system according to the concept	300,000 - 600,000 USD	International funding (part of a larger programme) or part of public irrigation investments (e.g. National Amelioration Company)
	6.2. Irrigation practice improved (with a focus on waterlogged areas)	not specified/ not known	3,000 ha (100% of current) irrigated sustainably	Study: Mapping of land affected by waterlogging and inappropriate irrigation and elaboration of pilot measures; Pilot measure: Establishment of a network of 10 pilot sites (2-20 ha); Investment: Materials for pilot sites (irrigation technology, rainfed varieties); Training: Accompanying training and information campaign	75,000 - 300,000 USD	International funding (part of a larger programme)
		500 ha degraded due to waterlogging	0 ha degraded due to waterlogging			

5. Monitoring of Implementation

The strategic targets that Kvareli Municipality shall seek to achieve are provided in the LDN Municipal Strategy (LDN-MS) Implementation Plan. The 2024-2030 LDN-MS Implementation Plan will be implemented during the 2024-2025, 2026-2027, 2028-2029 biennial and 2030 annual work periods.

5.1. Monitoring and Reporting Framework for the LDN-MS Implementation Plan and the Biennial/Annual Work Periods

Results based monitoring and reporting requires a structured system or framework for the collection and analysis of performance information at municipal level. Performance measurement framework is a process to systematically collect relevant data over the time frame of the planned work periods, to track and demonstrate progress made towards achieving expected results. It documents the major elements of the monitoring system, and ensures that performance information is collected on a regular basis. It also contains information on baseline, targets, and the responsibility for data collection.

At municipal level, the framework for measuring performance in the LDN-MS Implementation Plan and biennial/annual work periods comprises the results framework and the performance measurement actions, as well as the strategic framework. These frameworks therefore provide the basis for results-based monitoring and reporting and overall work period performance management for the Municipality Administration. These main frameworks may be accompanied by various tools that support the collection and analysis of the work period performance data as explained in subsequent sections under monitoring and reporting on the LDN-MS Implementation Plan and relevant biennial/annual work periods.

5.2. Monitoring and Reporting on the Implementation of the 7-Year LDN-MS Implementation Plan

5.2.1. Monitoring the Implementation of the LDN-MS Implementation Plan

In order to assess progress made in implementation of its 7-year LDN-MS Implementation Plan, Municipal Administration will undertake results-based monitoring of its work period performance. The results framework for the LDN-MS Implementation Plan defines “**what to monitor**”, and the performance measurement actions describe “**how to monitor**” the implementation and performance of the LDN-MS Implementation Plan. The two documents together with other accompanying tools will constitute the main monitoring framework and system for tracking progress on the implementation of the LDN-MS Implementation Plan. Monitoring the implementation of the LDN-MS Implementation Plan entails tracking these different levels:

(a) Overall strategic targets: Monitoring at this level entails assessment of higher level indicators, through studies and relevant evaluations. Performance information should be collected by the end of the 7-year period of the LDN-MS Implementation Plan. As the performance information required for this level of results is largely dependent on studies carried out at municipal level with supposed technical support of the MEPA and other related national and international institutions, the responsibility for ensuring identification and access to the required sources should be within cooperation level between central and local authorities. This may include the independent ad-hoc evaluation group and its coordinator/s.

(b) Subtargets: Subtargets are monitored based on performance data on indicators collected at least once per biennially. It also includes the documentation of results statements tracked through the collection of work period related performance information. This information is then used as the basis for external reviews and evaluations to assess performance at the strategic targets (results) level. Coordinator appointed by the Municipal Administration will be responsible for monitoring the focus area strategic subtargets (results) noting the contribution of the MEPA and other partners.

(c) Expected accomplishments: Monitoring entails annual collection of data on indicators of achievement at expected accomplishment level. Most indicators are quantitative, with specified variables to be measured and data collected as per the defined frequency in the relevant work period. Coordinator will have the overall responsibility for monitoring progress towards expected accomplishments, with the support of the MEPA, by collecting indicator data using data sheets once a year. This information is also have to be recorded and documented. Analysis of the data collected will be done for the preparation of the annual reports and also every two years at the end of every biennium. Findings from evaluations carried out during the reporting period, on the performance of the respective focus areas, also will provide valuable information to verify monitoring information that is largely self-assessment.

(d) Outputs: Monitoring implementation of outputs that contribute to the achievement of the LDN-MS Implementation Plan targets (results) is also part of the monitoring of the implementation during the work periods, because they are aligned. This is a continuous process undertaken by the Coordinator at all levels in the Municipal Administration.

5.2.2. Final Reporting on the Implementation of the LDN-MS Implementation Plan

Final reporting on the implementation of the 7-year LDN-MS Implementation Plan is a strong requirement, as the LDN-MS Implementation Plan is implemented through three successive biennial and one annual work periods, while also capturing the cumulated progress in the implementation of the LDN-MS Implementation Plan through the work periods performance indicators.

Since each of the subwork periods/focus areas is implemented jointly by different central and local organizations in a matrix fashion, the performance information for the report will be provided by them following instructions provided by the Coordinator from Municipal Administration.

Reporting on the implementation of the LDN-MS Implementation Plan will follow results-based principles and should cover the major achievements in relation to the strategic targets (results): progress on indicators of achievement measured against targets; results achieved at expected accomplishment level; resource utilization rates compared with budgets/allocations, and explanation for any variance. Reporting should be guided by the principles of good results-based reporting.

5.3. Process of Preparing the Beannual/Annual Reports - Roles and Responsibilities

Preparation of the annual progress reports on the implementation of the 7-year LDN-MS Implementation Plan starts in November and ends when it is presented to the Head of Municipal Administration (*Mayor of the Municipality*) in the first quarter of the next year. A summary of the document is presented to the Municipal Legislative Council (*'Sakrebulo'*) for the alternate year. The process which takes about three months may involve several steps and responsibilities.

The reports are consolidated by the Coordinator using performance data and information from municipal level activities – if necessary, comparing them with available regional and national focus area activities, which are tracked by work periods. If available, achievements at regional and national levels will be reported in separate paragraphs.

All the information provided should be validated using the evaluation and self-assessments. The LDN-MS Implementation Plan coordinator should ensure that all the information provided by municipal and, also central governmental organizations which are operating at municipal level, is cleared by the relevant heads of that organizations before submission to the coordinator.

Financial and Budgetary Division of the Municipal Administration will provide information on budget utilization for each focus area. To demonstrate efficiency in the use of resources towards achievement of the

planned targets (results), the financial information should include statements on variances between estimate, allotment and actual expenditure. Financial and Budgetary Division will be responsible for providing the interpretation on resource utilization, and explanations for any variances as appropriate.

The data and information will be consolidated by the Coordinator into a draft report, which will be circulated to the Municipal Administration relevant senior management team for validation and comments. Once the comments are incorporated, the revised report will be discussed in a senior management performance review meeting to assess the performance at municipal level, address emerging issues and provide management response and next steps.

The final draft with the management response is then presented by the Coordinator to the Head of Municipal Administration (Mayor of the Municipality) for work periods and also to the MEPA, for review and feedback. The final report is then prepared by the Coordinator incorporating feedback.

5.4. Data Collection

Monitoring will take place along the results chain. The process will involve tracking progress on implementation and recording achievement of targets (results) by collecting performance information on:

1. Delivery of targets according to categories
2. Expected accomplishments (subtargets) through
 - Indicators of achievement
 - Accomplishment accounts (highlights of results achieved)

If necessary, the Coordinator updates on the targets/subtargets and indicators of achievement, expected accomplishment and results attained through the implementation of respective work period during a given biennium.

5.5. Status of Implementation

The status of implementation of outputs shall be represented as a percentage of the total number of outputs planned for the biennium. That is why it is important to reformulate outputs that are already in process instead of adding new outputs which may not count towards the percentage value.

Not started – These are outputs whose implementation has not started.

In progress – These are outputs whose work is ongoing.

Implemented – These are outputs that have been completed and evidence for their implementation is available. These are outputs whose implementation has not started.

Reformulated – These are outputs that may have been changed to align with the outputs planned in the work period.

Postponed – These are outputs that are not going to be implemented in the current biennium due to factors such as change of financial constraints, etc. These outputs will automatically be included in the next biennium as recurrent outputs.

Terminated – These are outputs that will not be implemented in the current biennium and are not planned to be implemented in the future.

6. Opportunities at Local Level - The Way Forward

As it was already mentioned in Section 1 of the Strategy, the 2030 Agenda for Sustainable Development offers opportunities to curb the growing threats of land degradation and to reap multiple socioeconomic benefits of LDN.

Sustainable Development Goal 15 'Life on Land' and its target 15.3 on Land Degradation Neutrality (LDN) particularly encourage to 'combat desertification, restore degraded land and soil, including land affected by desertification, drought and floods, and strive to achieve a land degradation-neutral world by 2030 on both national and municipal levels.

SDG target 15.3 is strong vehicle for driving the implementation of the Convention.

To achieve SDG target 15.3, the following five elements have been identified:

- LDN targets: setting targets and establishing the level of ambition
- Leverage and impact: catalyzing the multiple benefits that LDN provides from climate change mitigation and adaptation to poverty reduction
- Partnerships and resource mobilization: rationalizing engagement with partners, overcoming fragmentation and systematically tapping into increasing finance opportunities, including climate finance
- Transformative action: designing and implementing bold LON transformative projects that deliver multiple benefits, and
- Monitoring and reporting: tracking progress towards achieving the LON targets

The target municipality has made the commitment to translate the national goals of achieving LDN by 2030 into local action by setting municipal voluntary targets with the support of the LDN Municipal Target Setting - in collaboration with the national authorities (MEPA) and supported by various partners.

The target municipality is among the Georgia's municipalities which have committed to set municipal voluntary LON targets, establish LDN municipal baseline, and formulate associated measures.

The LDN vision and strategy, LDN municipal targets provide the municipality with a strong vehicle for fostering coherence of policies and actions by aligning local (municipal) LDN targets with that of national LDN targets and also with measures from the Nationally Determined Contributions (NDCs) and other national commitments.

Finally, investing in LDN Municipal Strategy also will accelerate advancement of other SDGs due to the close linkages between land and other goals and targets, such as: Goal 1 (No poverty), Goal 2 (Zero hunger), Goal 5 (Promote gender equality), Goal 6 (Clean water and sanitation), Goal 8 (Decent work and economic growth), and Goal 13 (Climate action).

7. Glossary

This section provides brief description of the terms and indicators presented above.

LDN Target Setting

LDN, which stands for "Land Degradation Neutrality," is a concept and goal under the United Nations Convention to Combat Desertification (UNCCD). LDN is a framework that aims to achieve a balance between the amount of land being degraded and the amount of land being restored or rehabilitated. The goal is to ensure that, on a national or regional level, the amount of land being degraded is offset by an equivalent amount of land being rehabilitated or restored, thus maintaining a neutral or zero-net degradation status.

Target Setting: Defining specific and measurable LDN targets for the country, which indicate how much land should be restored or rehabilitated to counteract the degradation. These targets are often set based on scientific assessments and data.

Assessment: Conducting a comprehensive assessment of the state of land degradation in the country, including its causes and impacts.

Actions and Interventions: Identifying and planning the actions and interventions that will be taken to achieve LDN, such as afforestation, reforestation, sustainable land management practices, and more.

Monitoring and Reporting: Establishing a system for monitoring progress toward LDN, including the collection of data and regular reporting to track the success of the plan.

Resource Allocation: Determining the financial and human resources required to implement the plan and securing funding from various sources, which may include domestic budgets and international assistance.

Stakeholder Engagement: Involving various stakeholders, including government agencies, local communities, NGOs, and the private sector, to ensure a collaborative approach to achieving LDN.

Annual Cost of Land Degradation

The UNCCD defines land degradation as 'any reduction or loss in the biological or economic productive capacity of the land resource base. It is generally caused by human activities, exacerbated by natural processes and often magnified by and closely intertwined with climate change and biodiversity loss.' In the study featured here on the cost of land degradation, Nkonya and colleagues' approach the study of land degradation by investigating declines in land productivity in the past due to: i) land cover changes from a high value-biome to a lower-value biome, such as the conversion from forest land into cropland; and ii) declines in the ecosystem services provision within a land cover type due to the use of degrading practices.

Cost of Action

The costs of action are estimated by taking into account the following two cost categories: i) initial fixed investments and maintenance expenses that are related to the restoration of the high-value biome until it reaches biological maturity; ii) the inclusion of the opportunity cost given by the forgone benefits from the lower-value biome under replacement. The analysis of the costs is carried out over a **planning period of 7 years**.

Rural Poverty

The rural poverty headcount ratio is used to indicate level of poverty, i.e. the percentage of rural population living below the national poverty line. National poverty line is the benchmark for estimating poverty indicators

that are consistent with the country's specific economic and social circumstances and reflect local perceptions of the level and composition of consumption or income needed.

Sustainable Land Management (SLM)

SLM is the use and management of land resources: soil, water, animals and plants - for the production of goods to meet changing human needs, while ensuring the long-term productive potential of these resources and the maintenance of environmental functions. Degradation of water, soil and vegetation as well as emissions contributing to climate change can be limited through SLM practices that simultaneously conserve natural resources and increase yields.

Implementation Plan/Leverage Plan

Implementation Plan (Leverage Plan) is an essential component of the LDN Municipal Strategy and, at the same time, of the municipal and country's national commitments to combat land degradation and achieve land degradation neutrality, as outlined in the UNCCD. It will help municipality to address the environmental and socioeconomic challenges associated with land degradation while promoting sustainable land management practices through defining LDN targets related costs and funding sources.