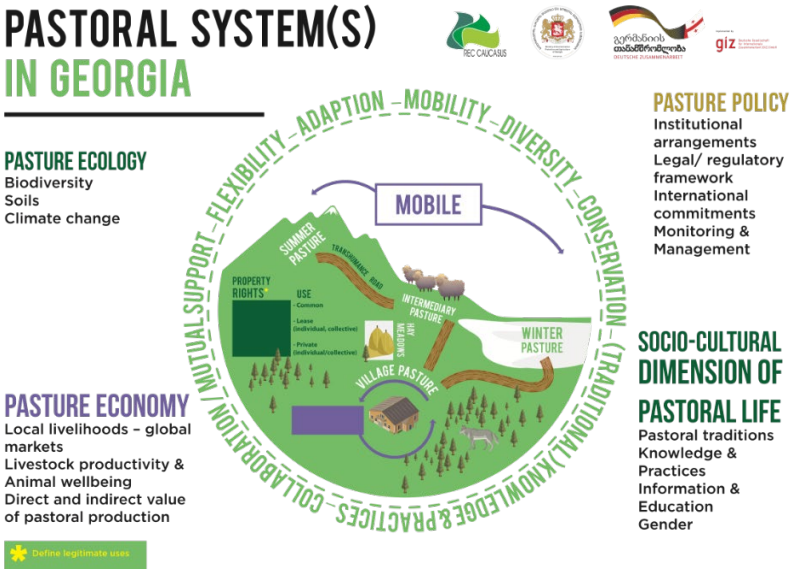
PASTURE MANAGEMENT IN GEORGIA

Background Study



October 2019 (1st Edition)

REC Caucasus

This document has been prepared with the support of the within the framework of the Project "Facilitation of Establishment of the State Programme for Sustainable Pasture Management in Georgia" as part of wider German Government supported Programme "Integrated Biodiversity Management in the South Caucasus (IBiS)" run by the German Society for International Cooperation (GIZ)

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PASTURE MANAGEMENT IN GEORGIA

Situation Analysis and Main Challenges
Recommendations for Development of Pastures Sustainable Management Programme

Background Study (1st Edition)

LANGUAGE: ENGLISH

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1. FOREWORD

This background study has been prepared by the Regional Environmental Centre for the Caucasus (REC Caucasus) within the framework of the Project "Facilitation of Establishment of the State Programme for Sustainable Pasture Management in Georgia" as part of wider German Government supported Programme "Integrated Biodiversity Management in the South Caucasus (IBiS)" run by the German Society for International Cooperation (GIZ).

Within the framework of the Caucasus Initiative of the German government, the German Government supported Programme "Integrated Biodiversity Management in the South Caucasus (IBiS)" cooperates primarily with the environment ministries of the three different countries of the South Caucasus. The programme follows a multi-level approach. At national level, it promotes the development or revision of biodiversity strategies and regulations, particularly in forest and pasture management, and in erosion control. The experience gained from the pilot measures at local level are incorporated into this process. As part of these pilot measures, relevant actors are provided with the skills needed to implement integrated approaches for sustainable management of biodiversity and ecosystem services.

The module objective of the programme is to promote better coordination of biodiversity and ecosystem services management across sectors on the basis of solid data. The programme comprises four areas of intervention with the following objectives:

A. Instruments and coordination processes for the sustainable management of biodiversity and ecosystem services at local level are tested.
B. The implementation capacity of line ministries, their subordinate bodies and of training institutions regarding the management of biodiversity and ecosystem services is improved.
C. The perception of the general public towards the importance of biodiversity and ecosystem services is more positive.
D. The regional exchange on sustainable management of biodiversity and ecosystem services is improved.

IBiS follows up on the achievements of the programmes "Sustainable Management of Biodiversity, South Caucasus" and "Integrated Erosion Control in Mountainous Areas, South Caucasus", and is due to last four years (from December 2015 to November 2019). The programme is implemented by the German Society for International Cooperation (GIZ) GmbH on behalf of the German Federal Ministry of Economic Cooperation and Development (BMZ) with co-funding in Georgia from the Austrian Governmental Development Cooperation Agency (ADC).

Currently, the Project "Facilitation of Establishment of the State Programme for Sustainable Pasture Management in Georgia" is being implemented by the REC Caucasus under IBiS umbrella.

The aim of the above Project is to create enabling conditions for establishment of state program on sustainable pasture management and provide demonstrations of best practices and and important lessons learned from the similar processes. The Project consists of the following components:

Component 1. Deevelopment of Pasture Management Background Study: Situation Analyses and Main Challenges based on desk review analyses of existing technical reports and available

data, with view of historical background of last 25-30 years and state of current affairs – including intuitional/legal analyses covering baseline information on existing institutional set-up and problems related to the division of responsibilities between the line ministries and local administrations in the area of pasture management and recommendations on main directions of the pasture management based on situation analyses and best international practices.

Component 2. Arrangement of National Validation Workshop and development of framework for creation of multistakeholder platform on pasture management policy development in Georgia.

The Sustainable Pasture Management National (State) Programme Framework will be developed based on the Background Study and findings of the Validation Workshop.

1. INTRODUCTION

„Whether the importance of pastoralism is appreciated by global communities or not, the environmental services of pastoralism need to be widely recognized and the respective governments in the pastoral regions should act effectively to protect or restore such services. Irrespective of whether the emerging economies can benefit from the past mistakes made in the pastoralism sector, it is important to maintain the environmental benefits of pastoralism while it still exists. As stated by Davis and Hatfield (2007): "The key is to disseminate improved understanding of pastoral society as broadly as possible, making both policy and the effective management of pastoral systems as widespread as possible in the future." Moreover, McAllister et al. (2006) stress that understanding past adaptation of pastoralism is important for planning and directing the future of pastoralism. Therefore, the lessons learned and experiences obtained in the past should be considered in the policy making for sustaining pastoralism in the future" (Dong 2016: 35).

Pasturelands in many respects play a prominent role in Georgia. The total area of agricultural lands, which includes that of pastures, exceeds 3 mio. ha, which amounts to 43.4% of the state's territory.

Although, the agricultural sector accounts for only 8.0% of the GDP the employment in the sector is with around 43% in Georgia in 2017 (GeoStat, World Bank) considerably high, and thus playing an important role for securing livelihoods and as basis for food security of the country.

Georgia has a long traditions of animal husbandry. the variety of natural, climatic and relief conditions of Georgia – with the coexistence of alpine, subalpine, valley and winter pastures – has facilitated the development of animal husbandry. Particularly, semi mobile forms of pastoralism (transhumance) adopted to the logic of varying climate conditions.

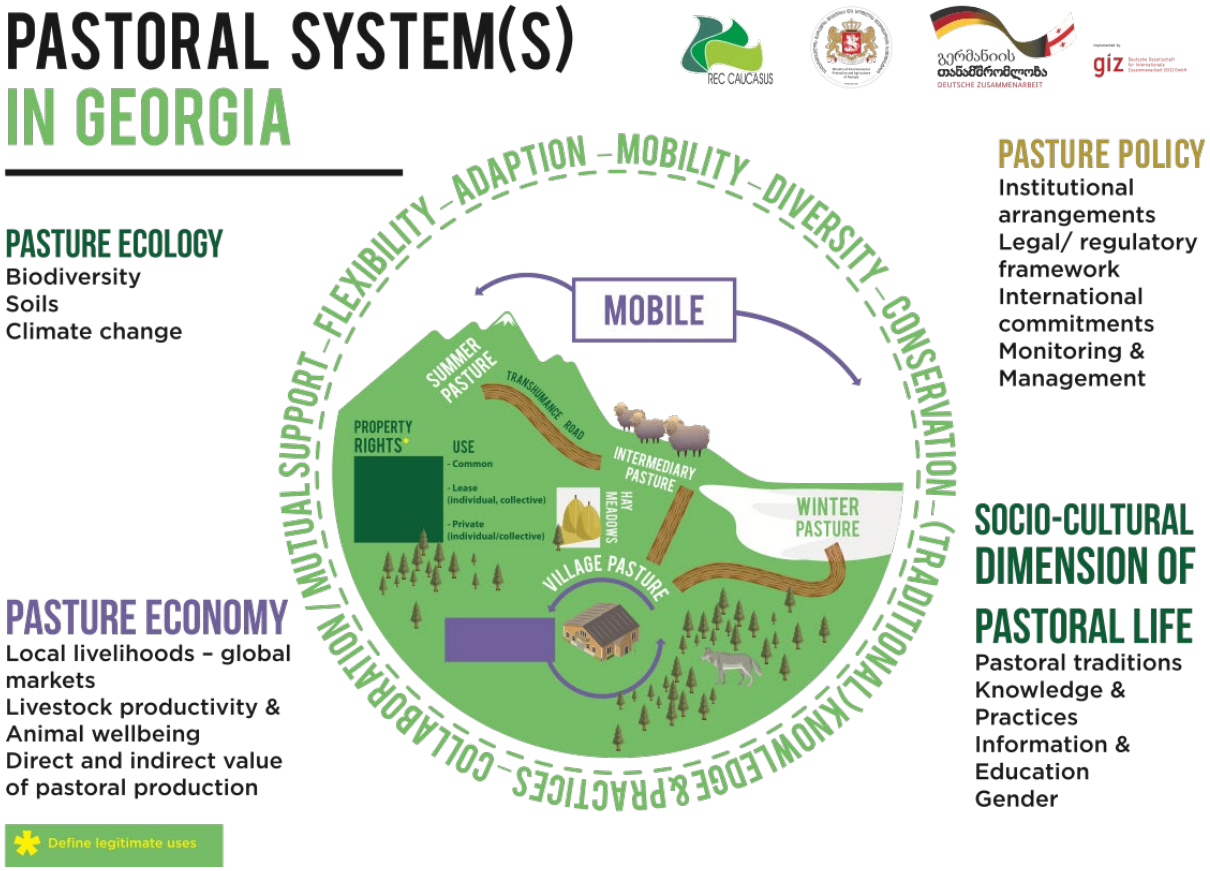
In main, subalpine and alpine meadows and semi-arid ecosystems, which are especially vulnerable to climate changes, are used as pastures. These ecosystems are an important and integral part of biodiversity of the Caucasus eco-region. Hence, a rational utilization of pastures is important both to preserve biodiversity and to develop agriculture.

The biodiversity of Georgia, including pastures and hay meadows, is under a great threat. Degradation of habitats, natural pastures and hay meadows is intensively taking place, which is caused by the incoherent utilization thereof (Neudert et al. 2015, Raaflaub and Dobry 2015, Shatberashvili et al. 2015) which is further aggravated by climate change. In the post-socialist period pasture systems have already undergone far-reaching shifts in management (Kerven et al. 2012, 2016, Notenbaert et al. 2012, Yu and Farrell 2013). A range of policy options allegedly enabling sustainable management currently under discussion. But to date strategies and implementations either at national or local level are lacking. The practice of excessive and/or uncontrollable grazing causes the degradation of vegetation and the erosion of the soil, which, in turn, creates new challenges for farmers (Behnke 2008, Li et al. 2012, Neudert et al. 2015, Raaflaub and Dobry 2015).

The basic structure of this background study includes the following two parts:

Part I of the study gives on overview the ecological features and the present condition of pastures in Georgia. It also provides for a situational analysis on practices of pasture utilization, socio-economic features of pastoralism and experiences with pasture management in protected areas of Georgia.

Part II covers baseline information on existing institutional set-up, legal gaps, as well as problems related to the division of responsibilities between the line ministries and local administrations in the area of pasture management. Furthermore, challenges regarding access rights, land registration and demarcation, management regulations and responsibilities etc. will be outlined and based on these recommendations developed.



Graph 1: Pastoral system(s) in Georgia

2. PASTURE UTILIZATION PRACTICE(S) IN GEORGIA

2.1. OWNERSHIP AND USE OF PASTURES

Approximately 43.4% of territory of Georgia (i.e. 3,03 million ha) is considered to be lands designated for agricultural purposes, which also includes hay meadows and pastures. 43% of the remaining area of the country's territory is included in the State Forest Fund. According to data from GeoStat Agricultural Census of 2014, the total area of pastures and hay meadows amounts to 1,940,400 ha (i.e. approx. 64%) of the total agricultural lands). Out of this 1,796,000 ha (i.e. 92% or 59% of the total agricultural lands) falls under pasturelands. Whereof more than 70% of the pastures is located in the Eastern and Southern parts of Georgia (especially in Kakheti and Samtskhe-Javakheti regions).

The legacy of past reforms resulted therein that Georgian pastures today include both privately and state-owned pastures and various patterns of pasture-use, which based on some expert estimations (Robinson, 2018; Mansour, 2016[1]) can be divided into the following groups:

1. Privately owned (privatized in 1992 under land reform or rented before 2005 and then privatized before May 2011) – 20%;
2. Owned by the municipalities – 3%;
3. Owned by the State and nominally governed by the National Agency of State Property[2] – 75%;
4. Owned by the State and managed by the Agency of Protected Areas – 2% (out of 7% of the total Protected Areas);

Both, the state and municipalities as well as private owners rent out pastures.

In Georgia, the transfer of a land into private property started in 1992. During the privatization of agricultural lands, the State mainly transferred arable land, perennial plants, and a relatively minor amount of pastures and hay meadows, to households. The leasing of pastures and hay meadows for a maximum of 49 years began in 1996. In 2005, privatization of pastures became prohibited, but it was possible to transfer pastures leased to before 2005 into private property, as well as, pastures which by the decisions issued by bodies of the State or Local Self-Governance (Governance) had been attached to structures/buildings owned privately by natural and/or legal persons and/or by the State. The tenants were allocated a certain time (May 2011) to privatize the leased pastures. After that date, it was no longer possible to transfer the pastures into private property in the same manner. Following the prohibition of pastures privatization, the pastures were transferred into private property in an indirect way once the category/designation of the pastures had been changed.

It should be noted that in 2005-2010 the law did not explicitly preclude local Self-Governance from registering pastures located and available in their territories. Thus, a part of pastures was registered as property of the municipality. Hence, nowadays the municipality has the possibility to lease them. However, after 2010, only few pastures were leased to by local Self-Governance bodies, except for Akhmeta Municipality, where pastures were leased in 2013. From 2011 to present day, only pastures owned by the State or the municipality can be leased. Yet, the

1 The middle of ranges given by this author have been taken and found as percentages of the total area of pasture and hay land in Georgia as defined by FAOSTAT.
2 The Agency falls under the governance of the Ministry of Economy and Sustainable Development of Georgia and exercises the rights related to privatization of state property, transfer with the right of use of state property and managing the companies established with government shareholdings.

National Agency of State Property suspended the leasing of pastures by a moratorium which is still in place.

The pastures were leased out via electronic auction. The leasing was conferred to the person, who would bid the highest price. The lessees of pastures often do not have livestock and they themselves lease pastures to local residents. There are no conditions ensuring sustainable management of pastures followed neither in leasing the pastures by the state, nor in leasing them by lessees.

It should be noted that in the 90's and the subsequent period till 2005, it was relatively easy to change the land designation (land category). That is why the category of part of pastures was changed, while in cases of other, designation was changed as well (they become non-agricultural land)[3].

As of 2004, only 84.5 thousand ha (4.7% of total pastures) of pastures and 44.0 thousand ha of hay meadows (30.6% of total hay meadows) were transferred into private property[4].

According to an agricultural survey of GeoStat from 2014, there are 574,077 agricultural holdings with agricultural land registered in Georgia, out of which 78,299 holdings utilize natural meadows and pastures. Private households utilize (own or rent) 300,000 ha of hay meadows and pastures – out of which 265,200 ha are pastures –, whereas legal persons utilize 34,800 ha of hay meadows and pastures. Hence, only up to 17% of the existing hay meadows and pastures are utilized by private households.

Table 1. Natural hay meadows and pastures operated by agricultural holdings by regions.

Region	Agricultural land, thousand ha	Natural hay meadows and pastures, thousand ha	Percentage of hay meadows and pastures from total agricultural area
Tbilisi City	2,817	385	13.7
Ajara Autonomous Republic	19,731	4,653	23.5
Guria	26,909	1,060	3.9
Imereti	65,737	5,410	8.2
Kakheti	315,499	149,230	47.3
Mtskheta-Mtianeti	20,829	7,313	35.1
Racha-Lechkhumi and Kvemo Svaneti	5,757	2,156	37.4
Samegrelo-Zemo Svaneti	66,662	3,027	4.5
Samtskhe-Javakheti	76,057	46,742	61.5
Kvemo Kartli	122,316	70,043	57.3
Shida Kartli	65,400	9,983	15.3
Total of Georgia	787,714	300,004	38.9

Source: GeoStat, Agricultural Survey of 2014.

[3] It took place because privatization of pastures was prohibited. It only became possible when category/designation of the land plot had been changed.

[4] Statistics Publication: "Natural Resources of Georgia and Protection of Environment, 2016"

Forty percent of the country's agricultural land is located in the Kakheti Region. In terms of pastures and hay meadows, Kakheti is the first in Georgia, followed by Kvemo Kartli and Samtskhe-Javakheti.

These data do not reflect the registration status of lands, meaning that it is not known how many ha of existing hay meadows and pastures utilized by households are privately owned or rented. According to these data, 1.5 mio. ha of pastures and hay meadows are not utilized.

Approximately 20-30% of country's agricultural lands are registered at the National Agency of Public Registry. The information only includes geographical information (location) and legal rights (ownership). Yet, the cadastral data of registered land indicates only the designation of land (agricultural or non-agricultural), but does not always indicate its category (pasture, hay meadow, perennial, arable).

2.2. AGROTECHNICAL ASPECTS OF PASTURE USE AND MANAGEMENT

Georgia has a long-standing and well-established traditions of animal husbandry. The variety of natural, climatic and relief conditions of Georgia (with the coexistence of alpine, subalpine, valley and winter pastures) has facilitated the development of pastoral farming and sheep farming since the time immemorial.

In spite of enabling natural and climatic conditions for the development of agriculture in Georgia, the development rate of this sector has been significantly lagging behind the development rate of other sectors of economy for past decades. Due to developments following the declaration of independence, sown and planted areas of annuals and perennials, as well as, heads of livestock have repeatedly decreased.

Table 2. Number of livestock heads and share of agriculture in GDP per Year.

Year	Large stock* (heads)	Goat and sheep (heads)	Share of agriculture in GDP in percent
1990	1,298,300	1,618,100	29.7
1995	944,100	724,800	41.7
2000	1,177,400	627,600	20.2
2005	1,190,600	815,300	16.8
2006	1,080,300	789,200	11.2
2007	1,048,500	797,100	10.7
2008	1,045,500	769,400	9.4
2009	1,014,700	673,800	9.4
2010	1,049,400	653,900	8.4
2011	1,087,600	630,400	8.8
2012	1,128,800	742,600	8.4
2013	1,229,700	856,800	9.4
2014	970,000	919,600	9.3
2015	992,100	891,400	9.1
2016	962,700	936,500	9.0
2017	909,700	907,00	8.0

*** Cattle and buffalos (no horses). Source: Strategy of Development of Agriculture of Georgia, 2015-2020; GeoStat.**

Although, few countries (including Georgia) have disaggregated official data on the contribution of pastoralist systems to national accounts, scientific research provides evidence that the contributions of pastoralism to the overall agricultural GDP are considerable (Dong 2016). The National Statistics Office of Georgia, GeoStat does not provide for disaggregate statistics either, but the output of agriculture clearly shows the importance of animal husbandry (see figure 1 below) supporting national economies considerably through livestock production – with cattle, sheep, pigs and goats as mayor livestock and thereby proving to be a viable lifestyle.

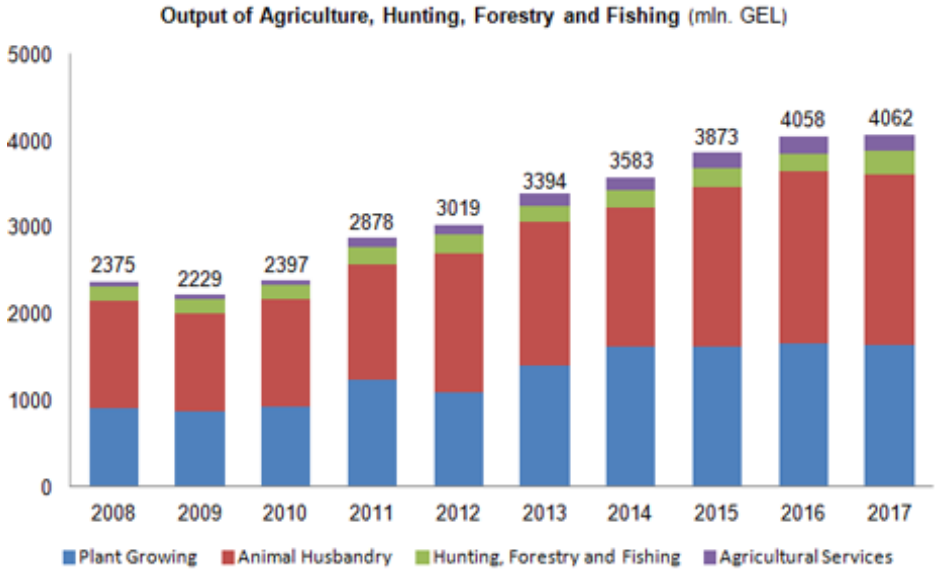


Figure 1. Output of agriculture, hunting and fishing. Source: GeoStat.

In terms of population of large stock, the leading regions are Samegrelo-Zemo Svaneti and Imereti, and Kvemo Kartli in east Georgia.

Table 3. Heads of cattle by regions in thousands.

	2014	**2015**	**2016**	**2017**
Georgia	970.0	992.1	962.7	909.7
Ajara Autonomous Republic	75.7	69.7	70.3	63.9
Guria	-	-	48.5	39.9
Imereti	163.2	168.4	171.4	166.6
Kakheti	110.0	110.6	97.2	95.9
Mtskheta-Mtianeti	-	-	34.8	35.8
Racha-Lechkhumi and Kvemo Svaneti	-	-	18.5	17.8
Samegrelo-Zemo Svaneti	183.9	199.7	190.8	175.5
Samtskhe-Javakheti	118.0	119.8	116.2	103.5
Kvemo Kartli	137.2	144.3	148.9	148.8
Shida Kartli	72.4	67.3	62.2	58.6

Source: GeoStat.

In terms of sheep farming, Kakheti is the main region followed by Kvemo Kartli, which has not had a large population of sheep in past, but the last 12 years this sector has been stably developing.

Table 4. Heads of sheep by regions in thousands (as of end of year).

	2014	2015	2016	2017
Georgia	865.9	841.6	875.9	855,9
Imereti	29.3	28.4	27.4	19.6
Kakheti	494.1	474.4	482.0	499.8
Mtskheta-Mtianeti	46.9	53.3	61.7	45.4
Samtskhe-Javakheti	80.5	69.0	71.8	70.7
Kvemo Kartli	187.8	185.2	203.7	193.4
Shida Kartli	20.7	23.6	22.0	20.7

Source: GeoStat.

Out of 642.2 thousand households surveyed in Georgia (out of them 544.1 households (84%) utilize agricultural land), 297.4 thousand households (46%) possess livestock. Out of them only 14.1 thousand households (2%) are breeding 10 and more beeves, while 3.1 thousand households breed 50 and more sheep and goats (0.48%)[5]. Hence, most of the livestock keeping households can be categorized as smallholders, keeping livestock at subsistence level. Especially for the rural population in Georgia livestock keeping is of high socio-economic importance as it provides a subsistence livelihood and income (Neudert et al., n.d.; Allahverdiyeva 2018; Didebulidze and Plachter 2002) and its performance is crucial to poverty reduction (FAO 2011) Therein, particularly common village pastures represent an important resource for the rural population. In addition, agriculture has an important role in securing food security.

Livestock Productivity

Both dairy cattle and beef cattle have low productivity. The average annual milk production of a cow is 110-1200 liters[6], while beef productivity does not exceed 40-50%. Main reasons for this are the absence of breeding grounds, restricted access to pastures, as well as unbalanced and limited diets that find their expression in low productivity and vulnerability to diseases.

Artificial fertilization is limited and unavailable to farmers in terms of both finances and territory[7]. Irrigation of pastures, as practiced during SU-times, is also absent and veterinary services are weakly developed.

The low productivity of milk and meat is mainly due to genetic obsolescence, inadequate veterinary service, limited knowledge about (new) technologies, and the quantitative and qualitative scarcity of a nutritional basis. Due to scarcity of feed basis, the farmers sell youngster/young stock at the age of 5-6-month. Altogether, these factors hinder the development of animal husbandry. However, according to the FAO, Georgia has favorable starting conditions for the development dairy farming and a continuously growing demand for milk, cheese and other dairy products (many of which are only produced in Georgia). Actual developments can be observed on the Georgian Dairy web portal: www.georgiandairy.org/ka.

According to the Development Strategy of Agriculture of Georgia, the facilitation of the development of breeding grounds (i.e. improving of varieties, breeding new varieties in the special farms to improve genetic characteristics etc.) has been identified as a strategic measure to address the challenges in the field of animal husbandry. This strategy implies the collection,

[5] GeoStat. Main Findings of Agricultural Survey, 2014

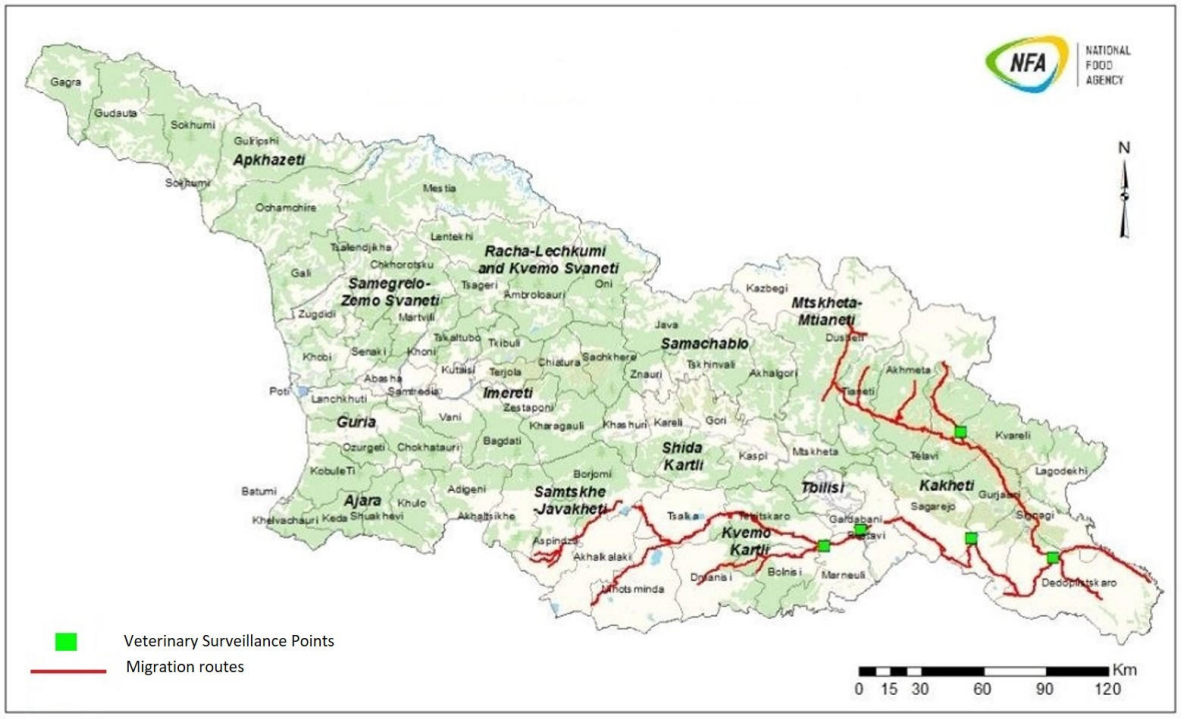
[6] In comparison, in terms of milk production, Holsteins and Brown Swiss have an average production of around 22330 l. (Holstein) and 19417 l. (Brown Swiss) per annum. C.f. https://www.differencebetween.com/difference-between-holstein-and-vs-brown-swiss/.

[7] Artificial fertilization stations in some regions of Georgia were implemented within the frames of the programme "Animal Health Management in Armenia and Georgia, phase 2" project, financed by the Austrian Development Agency.

study, restoration and improvement of local breeds, establishment of genetic and information banks, facilitation of creation of breeding grounds, and foundation of service centers for the artificial fertilization of animals.

Animal Welfare

According to the bulletin the world organization of animal health (OIE), the animal welfare sector is supported by the Georgian government through free vaccinations against serious cross-border animal diseases. In the Trans-Caucasus region, endemic diseases such as foot-and-mouth disease, lumpy skin diseases, petit plague, ruminants, sheep pox and goat pox, Crimean-Congo haemorrhagic fever, piroplasmosis, babesiosis and theileriosis, etc., can potentially enter or spread throughout the country due to seasonal livestock migration. To prevent vector-borne diseases, farmers treated their sheep in homemade plunge pools, but biosecurity practices were poor. In addition, loose compliance with acaricide regulations resulted in inadequate treatment and negative environmental impact. (Avaliani 2018: 48f.)



Map 1: Veterinarian Surveillance Points (VSP) and livestock migration routes in Georgia

The control of animal movements, including seasonal migration, is the responsibility of the National Veterinary Authorities of the National Food Administration (NFA). The Alliance Caucasus Programme (ALCP) has established a number of Veterinary Surveillance Point (VSPs) along the animal migration routes supported with government budget. In order to increase the productivity of livestock and their export potential "(…) the goals of the establishment of VSP are a) the animal welfare conditions along migration routes by providing watering places, animal rest areas, etc.); b) to monitor animal health during the migration; c) to raise awareness among animal owners in different fields (animal health, welfare, animal identification registration etc.); d) to treat animals against vectors to reduce the negative effects of external parasites. The locations of these VSPs were selected in consultation with relevant stakeholders, including the Shepherds Association of Georgia, animal husbandry experts and local municipalities. Five VSPs currently

operate along the migration routes with one additional VSP yet to be established." (Avaliani 2018: 49f.)

VSP´s are iron-fenced concreted facilities, consisting of two separate areas: "(…) one for large ruminants and one for small. Both have isolated animal-holding pens, animal treatment zones and animal-resting areas. VSPs function seasonally, during the period of animal migration. Small ruminants are treated by dipping them in a pool where they swim freely and are soaked in an acaricide, while large ruminants are herded through narrow thoroughfares where they are showered" (Avaliani 2018: 50).

According to Lasha Avaliani, Delegate of Georgia to the OIE; Head of the Veterinary Department of the National Food Agency (MOEPA) Veterinary Surveillance Points "(…) represent a potential opportunity to increase the efficiency of state Veterinary Services, enabling them to make targeted inspections and control risk conditions at specific locations in a cost-effective manner. In the future, it is planned that VSPs will have additional functions, such as vaccination, sampling, and animal identification. These VSPs would also help to ensure that animal owners take part in knowledge, attitude and practice (KAP) surveys and participatory surveillance"(Avaliani 2018: 50).

2.3. TRADITIONS AND PRACTICE OF UTILIZING PASTURES

Nomadic pastoralism/Transhumance

Semi-Nomadic pastoralism/Transhumance is a widely common practice in Georgia. The system is based on a flexible and climatically adopted utilization of natural grasslands – high mountainous ones in summer, and the ones in lower altitude (valleys and lowlands) in winter.

Sheep, as well as, cattle (especially dry livestock) is brought to alpine pastures in summer (at the end of May), while it is herded in lowland areas to get over winter (starting from mid-October).

This semi-mobile practice of pastures utilization is especially attributed to sheep farming. One of its most vivid examples is the seasonal migration of sheep from pastures located in the southeastern part of Kakheti (winter pastures of Shiraki) to high mountainous alpine pastures (in Tusheti). Both mobile and local sedentary sheep farmers/pastoral farmers use the winter pastures.

In summer, it is a widely held practice to herd livestock on subalpine and alpine pastures in the western regions of Georgia. However, the migration distance is relatively small compared to the Kakheti route. The villages in high mountainous regions use the nearest alpine and subalpine grasslands.

The grazing on high mountainous grasslands is intensive from the beginning of summer to autumn. Mainly dry livestock is herded on summer alpine pastures. Dairy cows are left on place and graze on nearby village pastures (sometimes other agricultural lands). Several villages hire herders who herd their and trusted livestock on alpine pastures during the whole summer season.

Due to decrease in population of livestock in high mountainous regions, it is observed that subalpine and alpine pastures are being naturally forested, whereas the bottleneck of pastoral use of grasslands are winter pasture areas.

Figure 2. Forestation of pastures in Racha

Alpine and subalpine meadows are used for hay making – as an additional fodder source especially in winter. On average, one household makes 12-15 tons of hay for winter. The members of the community help each other to make hay. Mainly hand tools are used for making hay. The hay mostly is transported to the villages by trailer tractors or trucks.

Clipping 1: Pastoral developments in Tusheti

In Tusheti, a high mountainous region of east Georgia, alpine and subalpine grasslands cover 70 thousand ha, which are under Tusheti´s Protected Areas (National Park and Protected Landscape).Tusheti dwellers use pastures as summer pastures, while they herd sheep and livestock in southeast Georgia – Shiraki (ca. 200 km from Tusheti) – in winter. This route emerged in the 17th century and totally depends on natural pastures as a main source for feeding sheep. Traditionally, rules of zoning agricultural areas and plot (field) rotation were strictly kept in Tusheti which ensured the preservation of topsoils and sustainable utilization of pastures. Tusheti dwellers used areas at altitudes up to 3000 meters as pastures. Every pasture was divided into several vertical zones. In addition, pastures for dairy cattle, livestock and sheep were allocated.

Figure 3. Subalpine and alpine grasslands of Tusheti

Since the 60s of the 20th century, the agricultural policy of the Soviets aimed at increasing the sheep population and the traditional ways of agriculture faded into oblivion. As a consequence of intensified and unsystematic grazing, both winter and summer pastures ended up in dire

conditions. As of today, a major part of Tusheti's agricultural areas is heavily eroded and under landslides. The situation is particularly severe on arable lands, which are used as pastures now. The elimination of traditional agricultural techniques and approaches caused a change in traditional ways of living. Tusheti dwellers turned their backs on sowing and planting and shifted completely to semi-nomadic lives.

The conservation and renovation of the natural values of Tusheti´s unique landscapes, agricultural biodiversity and traditional culture of pastures utilization are the most important priorities for a healthy existence of Tushet Protected Areas. The Management Plan of Tusheti Protected Areas recommends to restore the spatial (vertical) distribution of grazing, to move sheep stands to higher altitudes, to non-slippery slopes, to prohibit grazing near villages, to prepare a map showing risks of erosion and to prohibit grazing in high-risk zones, to rehabilitate widely eroded areas, to develop and introduce a financial incentive system, and to sustainably make hay.

Non-nomadic pastoralism/Sedentary pastoralism

Households use unfenced meadows near their villages as common pastures for their livestock. Sometimes arable lands that have been left uncultivated for years are used as pasture as well. In addition, in some areas mowed hayfields and harvested fields are seasonally used as pastures in late autumn and winter. Villagers themselves (in rotating shifts) or by employing hired herdsmen move village livestock to the pastures every morning. In the evening, the livestock returns back its homestead where it (often) receives additional fodder.

Pastures are rarely irrigated. Measures of pastures maintenance and productivity enhancement, such as soil fertilization or the elimination of shrubs and weeds, are rarely practiced. In some regions, pastures are informally distributed among communities and villages.

2.4 SOCIO-ECONOMICS AND ECOSYSTEM SERVICES OF PASTURE/GRAZING LANDS

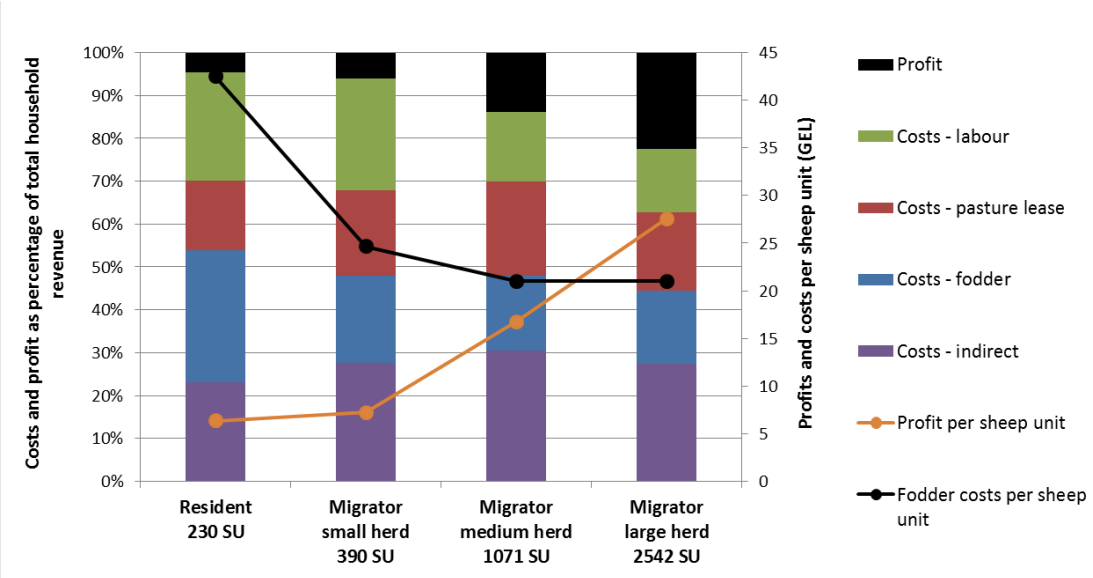


Figure 4: Profitability of livestock production for different household profiles including sedentary (resident) to mobile pastoralists (migrator) in Kakheti.

Whilst in Georgia stationary and mobile forms of livestock keep co-existing, it is the mobile pastoralist system that is believed to utilize the physical, climatic, and vegetative variations best (Dong 2016). Mobile forms of pastoralism according to Simel (2009) and Hesse (2009) are considerably more productive per hectare than commercial stationary ranching systems or sedentary livestock keeping in similar environmental conditions. The Economics of Land Degradation (ELD) policy brief on pasture management in Georgia (focusing on Kakheti region) – based on the analysis of household budgets – suggest "(…) that the livestock-related activities of migratory households, having lower fodder costs, are generally more profitable than households resident in one location. Migratory households having very large herds create the economies of scale necessary to generate profits per animal which are significantly higher than those of residents" (ELD 2018).

Clipping 2: The Economics of Land Degradation

Georgia is one of 114 countries that committed to define national LDN targets and an implementation strategy. The process of setting up national targets and an implementation strategy for LDN in Georgia started in 2016 in the frame of the´Target Setting Program´ (TSP) facilitated by the Global Mechanism. Cross-sectoral meetings yielded in a set of national LDN targets, which were submitted to the UNCCD Secretary by the Ministry of Environment and Natural Resources Protection of Georgia in September 2017

Land degradation in Georgia can be characterized by the following aspects:

- **Loss of natural vegetation and soil quality caused by overgrazing;**
- Loss of agricultural productivity and soil due to inappropriate farming techniques;
- Reduction of area and quality of forests due to illegal extraction and inappropriate forest management;
- Loss of productive land due to urbanization and conversion into non-agricultural areas (E.C.O. 2017).

Georgia National Targets by 2030[8]

1. Integrate LDN principles into national policies, strategies and planning documentations;
2. About 1500 ha of degraded forests will be afforested and about 7500 ha will be reforested and 60% of forests will be managed sustainably;
3. Protected areas coverage should reach 12 %
4. Degraded land will be rehabilitated
5. Irrigation and drainage system will be improved

Altogether the above-mentioned factors have globally changed the perspective on pastoralism during the past years, now considering mobile forms of pastoralism a viable economic system which can improve the livelihoods of pastoralists and contribute to poverty reduction and environmental management (Pastoralist Thematic Group 2001; cited in Dong 2016:27f.)

[8] Ministry of Environment and Natural Resources Protection of Georgia 2017. National Land Degradation Neutrality Target, Tbilisi, Georgia.

In addition to economic values, pastoralism has significant environmental value by providing all kinds of ecosystem services (listed by Millennium Assessment 2003), including provisioning (such as food and fiber), supporting (such as soil formation and retention), regulation (such as climate regulation), and cultural (such as spiritual and religious) services (c.f. Rodríguez-Ortega et al. 2014). In terms of ecological services, a great amount of evidence shows that effective animal grazing can contribute to maintaining healthy rangeland vegetation, which generates rich biodiversity, promotes biomass production, functions as a carbon sink, reduces erosion, maintains soils, and facilitates water-holding capacities (Voisin 1959; Savory 1999; Frank et al. 1998).

The Economics of Ecosystems and Biodiversity (TEEB) Initiative aims at promoting a new economy in which the values of natural capital, and the ecosystem services this capital supplies, are fully reflected in public and private decision-making. In 2012 the Government of Georgia became one of the pilot countries for TEEB and volunteered to assess and validate its natural capital (i.e. including non-monetary values), and the services provided by the country's ecosystems. Therefore in 2012 a TEEB scoping exercise was initiated to identify policy priorities which could inform and form the basis of a TEEB Country Study for Georgia. Therein agriculture was among the five core sectors the scoping study identified. The study highlights the substantial dependence of these driving forces of the Georgian economy on natural capital and the services it provides (UNEP & WWF 2013).

3. MAIN TYPES OF PASTURES

Hay meadows and pastures of Georgia are natural and semi-natural habitats which require sustainable management to prevent their degradation.

Grasslands and meadows are widely common ecosystems in Georgia. The types of grassland vegetation in Georgia includes ecologically different grass phytocoenosis, which significantly varies under the influence of different elevations above sea level, moisture, exposition and other biophysical parameters.

Meadows occupy especially large areas in mountainous zones (subalpine, alpine, subnival zones). Meadows are rarely present in valleys and today these territories in most cases are used for agriculture. Part of the meadows (so called secondary meadows) arose from deforestation

It is considered that primary meadows in Georgia are common only in alpine and subnival zones. At 1800 meters and below primary meadows are found in heavily moist territories and semi-deserts.

According to a phytosociological classification system, which was and still is widely used in academic circles in Georgia, and vegetation formation, the following types of meadows are found in Georgia:

— alpine meadows, which are divided into high mountain typical meadows, subalpine tall grassland and alpine meadows and patches. Formations differ in forming species and degree of development of grass vegetation (plant height, biomass, etc.).

— low mountain and plain meadows – they are found in west and east Georgia's foothills and dales. An absolute majority of such meadows is primary as they materialized at the places of former forests. There are many variations of dale meadows, but each of them is characterized by ability to create turfs.

— steppes – they are found only in east Georgia, in the driest regions of Kakheti, Shida Kartli. There are found steppe communities in Georgia where yellow bluestem (*bothriochloa ischaemum*), needle grass (*stipa capillata, stipa lessigiana*) and steppe needle grass (*festuca valesiaca*) and the Volga fescue (*festuca valesiaca*) dominate.

— semi-deserts – are found in Eldari plain and dales of Kvemo Kartli, as well as, on Shiraki and Alazani plains at between 200-800 meters above the sea level. There are fields dominated by Artemisia, dale saltwort (*salsola dendroides, salsola ericoides*) in semi-deserts.

According to the EUNIS (European Union Nature Information System)[9] habitat classification, the habitats found in Georgia's pastures belong to group E-Grasslands and land dominated by forbs, mosses or lichens. The following habitats have been identified in this category:

[9] http://eunis.eea.europa.eu.

E1. Dry grasslands.

E1.1. Inland sand and rock with open vegetation.

E1.2. Perennial calcareous grassland and basic steppes.

E1.2E. Irano-Anatolian steppes.

E1.4. Mediterranean tall-grass and Artemisia steppes

E2. Mesic grasslands.

E2.1. Permanent mesotrophic pastures and aftermath-grazed meadows.

E2.2. Low and medium altitude hay meadows.

E2.3. Mountain hay meadows.

E2.32. Ponto-Caucasian hay meadows.

E2.5. Meadows of the steppe zone.

E2.8. Trampled mesophilous grasslands with annuals.

E3. Seasonally wet and wet grasslands.

E3.4. Moist or wet eutrophic and mesotrophic grassland.

E3.5. Moist or wet oligotrophic grassland.

E.4. Alpine and subalpine grasslands.

E4.1. Vegetated snow-patch.

E4.13. Ponto-Caucasian snow-patch grassland.

E4.2. Moss and lichen dominated mountain summits, ridges and exposed slopes.

E4.3. Acid alpine and subalpine grassland.

E4.4. Calcareous alpine and subalpine grassland.

E4.44. Ponto-Caucasian alpine grassland.

E5. Woodland fringes, clearings, and tall forb stands.

E5.1. Anthropogenic herb stands.

E5.2. Thermophile woodland fringes.

E5.3. Bracken fields.

E5.4. Moist or wet tall-herb and fern fringes and meadows.

E5.5. Subalpine moist or wet tall-herb and fern stands.

E5.5A. Ponto-Caucasian tall-herb communities.

E6. Inland salt steppes.

E6.2. Continental inland salt steppes.

E7. Sparsely wooded grasslands.

E7.2. Sub-continental parkland.

The detailed description of the abovementioned phytocoenosis and habitats is given in the Annex 1.

4. PRESENT STATE OF PASTURES

The Soviet-period economic policy and the shift towards industrial agriculture caused a serious degradation of agricultural ecosystems and a reduction in genetic resources of local plants and animals important for agriculture. Natural meadows, which have been used as pastures and hay meadows for centuries, were especially affected.

Unfortunately, the pace of degradation of pasture vegetation significantly exceeds that of restoration that in most cases excludes the possibility of natural self-regeneration of vegetation. An extremely dire situation can be observed on winter pastures, where together with overgrazing a process of desertification has started.

These processes have become especially intensive since the 90s of the past century, when pastures utilization practice took an unsystematic and irregular turn.

The advent of market economy witnessed a transfer of communal and Soviet livestock to private farmers, while a considerable part of pastures was leased to. In parallel, a system of pastures management and monitoring was completely eliminated.

Today, significant parts of both winter and summer pastures are covered by modified meadows thereof a considerable area can be characterized as disrupted natural ecosystems. Due to the large volume of livestock grazing, intensive processes of desertification and soil erosion have started in pastures, which are especially vivid in east Georgia.

The semi-arid zone of Georgia (Kakheti) has been historically used as a winter pasture (from September to April) for livestock (mainly sheep). Livestock herded here, grazes on summer pastures in the northeast and central parts of Georgia. However, the existing area of winter-pastures is not sufficient for the livestock, which has increased in number for the past years.

Figure 5. Section of degraded pastures

Considering the semi-arid features of the zone/area the seasonally high number of sheep and uncontrollable grazing causes overstocking and signs of disturbance. For example, the Shiraki

pastures, whose total area amounts to 57 000 ha, endure more than 400 000 sheep (more than half of sheep of the country) for more than seven months. Such a high concentration of the sheep and an intensive utilization of pastures cause overgrazing, which becomes a reason of territory degradation.

Figure 6. Winter pastures in Shiraki, Kakheti

Significant erosive processes on winter pastures in Kakheti have been observed. High and low parts of the pastures, except for modern terraces of Iori and Alazani, are composed of deposit rocks with the content of sea salt, which are easily subjected to weathering, collapsing and washing processes. The rocks having collapsed from the slopes gather on relatively plain pastures and cause an increase in salt content of the soil.

Sheep farming is a traditional sector in the Mtskheta-Mtianeti region. During the Soviet Union, there were approximately 120 000 heads of sheep in Kazbegi Municipality, while their number exceeded 200 000 in Tianeti and Dusheti Municipalities. A drastic reduce in sheep is preconditioned by a shortage of winter pastures.

The degradation of pastures is an important problem for Samtskhe-Javakheti region as well. Their productivity has perceptibly decreased. An additional problem is brought about by inadequate veterinary services. Irregular herding routes and disordered summer camps lead to risks of spreading such diseases as foot-and-mouth disease and anthrax.

Due to sheep overgrazing, pastures on both slopes of Kvernati Ridge in Shida Kartli are moderately eroded; at some places, soil erosion is being observed.

However, there are miscellaneous opinions about the condition of pastures. These opinions are held due to the fact that it has been long times since in-depth investigations of pastures have taken place. Since the collapse of the Soviet Union, the pastures assessment and monitoring system has been dysfunctional in Georgia. The methodologies that have been used in Soviet times are either outdated or require an engagement of huge amount of material and high-qualified human resources. Unfortunately, together with the collapse of uniform state financing system the relevant research institutes have become unable to pursue their researches which resulted in cessation of pastures assessment and monitoring. Hence, Georgia today is lacking both an up-to-date assessment of pastures and a monitoring.

4.1. STATE OF PASTURES IN PROTECTED AREAS

In recent years, investigations to assess pastures conditions, especially in Protected Areas, have taken place via the Technical Assistance of international organizations. The sustainable utilization of natural pastures is a problem for many Protected Areas of Georgia. The responsibility for managing pasture was assigned to the Agency of Protected Areas some years ago. However, there are some institutional gaps in this regard in the Agency of Protected Areas. The Agency does not possess the respective knowledge and experience and there are no overall policy or strategic plans for pastures management in Protected Areas.

However, with the support of international organizations and local partners the pastures in Chachuna, Javakheti, Vashlovani, Lagodekhi, Borjom-Kharagauli and Tusheti Protected Areas have already been assessed and respective management plans are developed or measures for pastures sustainable management are included in the management plans for protected areas. The findings of the assessment of pastures in Protected Areas are briefly described below.

Table 5. Pasturelands within Protected Areas

Protected Areas	**Area of Pasturelands, ha**
Borjomi-Khargauli National Park	10 700
Vashlovani Protected area	17 410
Lagodekhi Protecteda area	2 350
Tusheti National Park	17 400
Javakheti National Park	8 400
Cachuna managed Reserve	2 200
Korugi Managed Reserve	255
Ktsia-Tabatskuri managed Resreve	19 000

The steppes and semi-desert ecosystems in the territory of the Vashlovani National Park have been used as winter pastures for large and small livestock. The Vashlovani and Shiraki valleys play an important role in the development of the sheep farming sector of Georgia. Here, sheep herds from northeastern and central parts of Georgia are gathered during the winter.

According to the Law on Establishing and Managing Tusheti, Batsara-Babaneuri, Lagodekhi and Vashlovani Protected Areas (2003), it is allowed to graze in traditional use-zones of the Vashlovani National Park territory. This zone was created to meet the indispensable economic interests of local population by the sustainable use of natural resources.

The whole territory of the winter pastures is divided into plots, i.e. separate pastures. The area of plots varies from several dozens to 500 ha. There are total of 45 farms on pastures of Vashlovani National Park territory, while there are 17 farms on the adjacent territory of the Park (Eldari lowland, Patara Shiraki, Iori steppe).

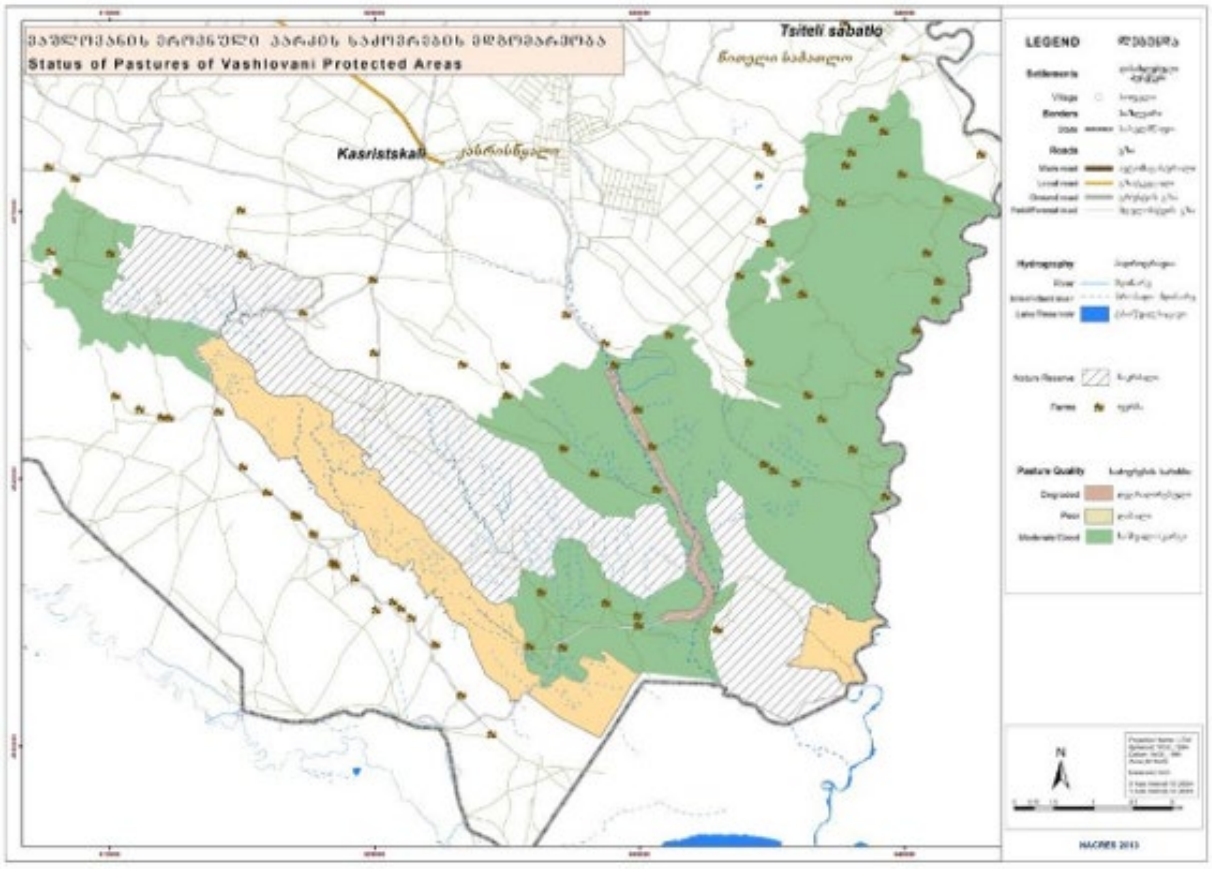
There were miscellaneous opinions about the condition of Vashlovani winter pastures. The assessments of the experts were extremely different, since there was no information about de-facto users, borders and conditions of pastures. Therefore, the Agency of Protected Areas

limited the leasing-out of pastures, which stirred a conflict between the Agency and the local sheep farmers.

Based on primary findings[10] of the assessment of pastures in Vashlovani Protected Area, due to critical condition of these pastures it was recommended to remove the farmers using these pastures from the territory of the National Park. However, a further assessment[11] held in 2012 revealed that the major part of the pastures was in good or very good condition. A large dry biomass was observed on pastures, which indicated a low intensity grazing. The findings of the previous assessment were interpreted as a peculiarity of the ecosystem in which during dry years vegetation tends to be reduced; which can be understood as strong degradation.

A more detailed study[12] of pastures in Vashlovani Protected Areas in the following years revealed that their major part (54%) was in a good condition. The eroded areas (20%) were observed in the central part of the Vashlovani National Park, alongside the Likistskali River and in the adjacent territory of Bughamoedani. The degraded territory is a sheep migration route. The main cause of erosion is an intensive sheep grazing and unorganized migration.

Map 2. Status of pastures of the Vashlovani National Park



[10] Protected Areas Development Program, GEF/World bank, Acta Consulting Georgia, LLC, 2007

[11] Center for Biodiversity Conservation & Research – NACRES– and Flora and Fauna International, 2012. Rangelands Condition and Assessment Vashlovani National Park and Associated Project Areas. The investigation employed Gans Ginsburger's methodology (CEFE (Centre d'Ecologie Fonctionnelle et Evolutive, Centre National de la Recherche Scientifique, France) techniques (Daget and Poissonet 1971; Gintzburger 1986) in collaboration with Nikolos Lachashvili and Teimuraz Popiashvili.

[12] The study was conducted under the following project: Sustainable Management of Pastures in Georgia for the purposes of demonstrating climate change mitigations, adaptation benefits and dividends to local communities, UNDP/EU.

On the basis of the mentioned study, a Pastures Management Plan of the Vashlovani National Park has been developed (UNDP, NACRES. 2014). The plan lays out different measures of improving the pastures' conditions.

The condition of pastures in the territory surrounding Taribana Valley, Chatma and Chachuna Managed Reserve is assessed13 as averagely or moderately degraded. Chachuna Managed Reserve is one of the driest places in the Caucasus. The territory is used as winter pastures. 30-40 thousand heads of sheep are grazing in its surrounding territory (ca. 5 thousand ha) of the Managed Reserve. Unsystematic grazing and inobservance of stocking rates are coupled with inadequate supply of potable water for sheep herds nearby the Managed Reserve's territory.

The assessment of the pastures nearby the Chachuna Managed Reserve showed that the zones of heavy erosion have quite a high percentage. The zones of farmer's camps and the places nearby the routes to water sources were especially degraded and required rehabilitation. It was suggested to introduce a system of rotational grazing, limitation of the grazing period, reduction of loading rates, establishment of partial stall-feeding, adoption of amelioration measures (arrangement of watering places), usage of fertilizers, improvement of pastures by seeding such species as forage kochia (*kochia prostrata*), crested wheatgrass, desert crested wheatgrass, Siberian wheatgrass (*agropyron pectiniforme, agropyron desertorum* and *agropyron sibiricum*) and Artemisia.

The alpine and subalpine zones of the **Lagodekhi Managed Reserve** are intensively used as summer pastures. As per data of the Lagodekhi Municipality, 50 000 heads of sheep were annually grazing there in Soviet times. The sheep farming is of semi-nomadic type. At the end of May the sheep farmers move/migrate the sheep to summer pastures of Sabatkne, Kabala and Kudigori. There is no dwelling infrastructure on pastures. There are only stone or wood huts, i.e. quarters, which are completely unfurnished.

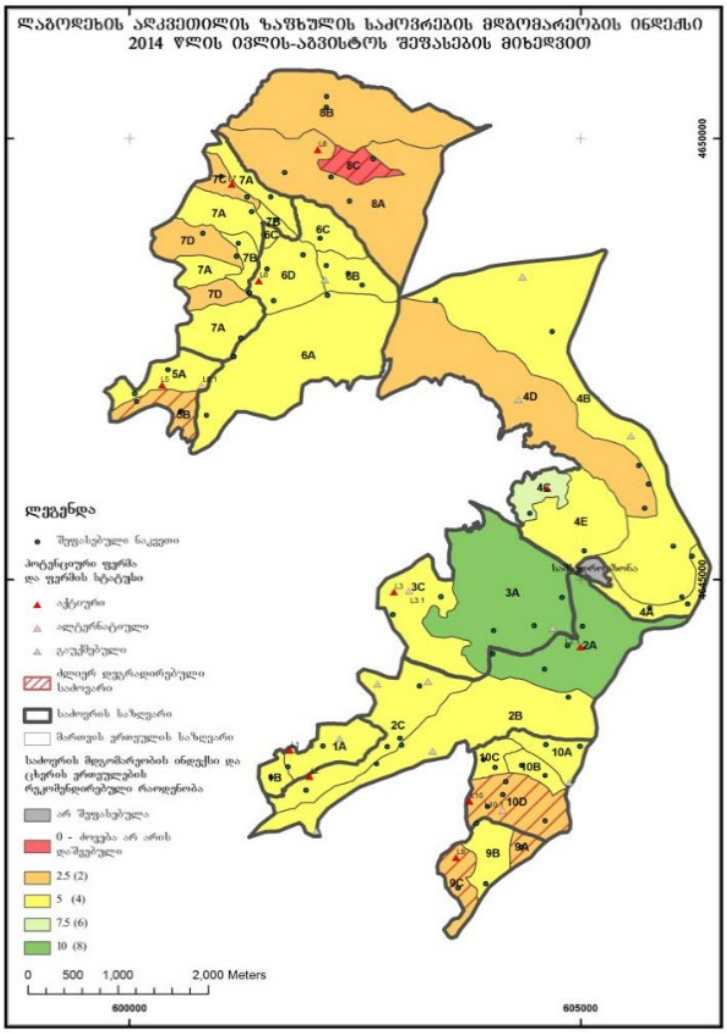
Since the 90s, the number of sheep has decreased. However, sheep farming still plays an important role in the economics and agriculture of the region. On the other hand, following the collapse of the Soviet Union, the grazing has taken an uncontrollable turn. Having transferred the management right of pastures to the Agency of Protected Areas in 2003, the issue of sustainable management and legal governance of pastures has appeared on the agenda of Administration of Lagodekhi Protected Areas.

A study[14] on the status of pastures in Lagodekhi Managed Reserve uncovered considerable difference in terms of stocking units. The head of sheep per hectare significantly varies among individual pastures; if there is 2.2 head per ha at some places, at others it reaches 37.9 head/ha. It was suggested to establish an average stocking rate. Following that, the livestock from the overloaded zones were moved to new pastures which were not grazed.

The grazing was ceased on particularly degraded zones for at least two year. In addition, pastures improvement measures (removal of stones, elimination of weeds, fertilization, introduction of regulated grazing and pastures rotation) were implemented. A lease agreement envisaging the observance of ecological norms was signed with the majority of farmers by the Agency of Protected Areas.

[13] The condition of pastures was assessed under the framework of the project: Improvement of biodiversity in prioritized transboundary protected areas of Ior-Mingechauri region (financed by Federal Ministry of Economic Cooperation and Development (BMZ) and World Wide Fund for Nature (WWF) – National German Committee. The project is being implemented by WWF Caucasus Program Office.

[14] The study was undertaken, and the Pastures Management Plan was prepared under the EU Twinning Program by Center for Biodiversity Conservation & Research, NACRES.



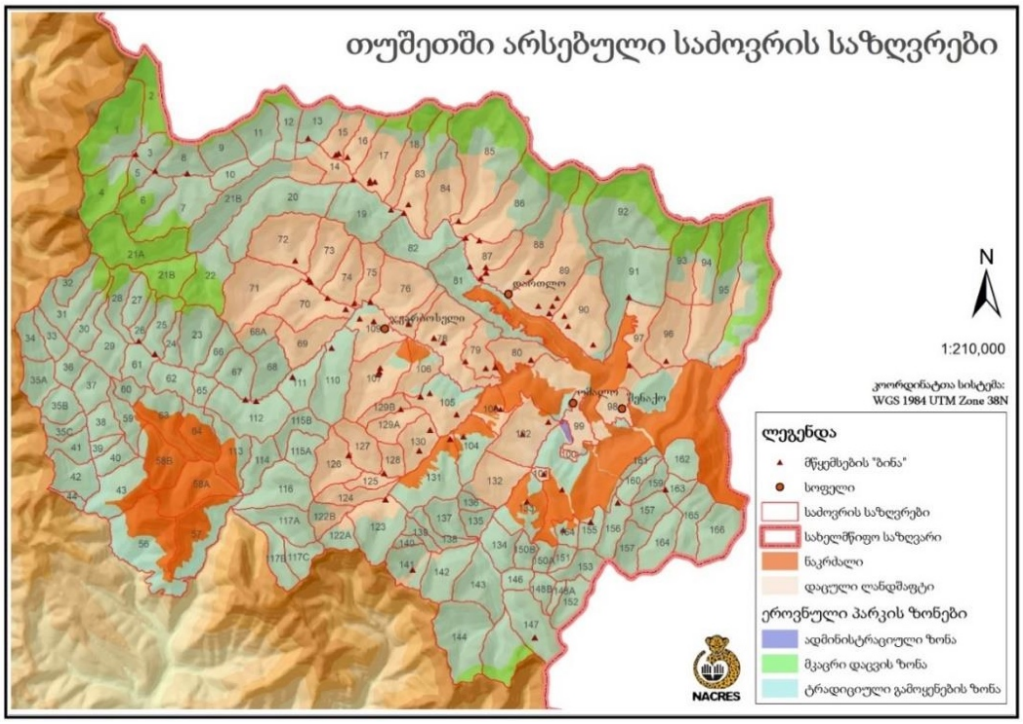
Map 3.
Status of pastures of Lagodekhi Managed Reserve by SPI Index.

The alpine and subalpine meadows of the **Tusheti Protected Areas** have been used as pastures for small and large stock for centuries. The sheep farming is a traditional activity of the Tusheti dwellers and is characterized by seasonal nomadic migration. At the end of May the sheep farmers move the sheep to summer pastures in Tusheti, while in autumn the sheep farmers return to winter pastures in the Vashlovani National Park and its surrounding.

As a consequence of the Soviet agricultural policy which focused on increasing the population of sheep, the Tusheti's traditional way of agriculture was forgotten. It was replaced by an intensive agriculture, which envisaged a maximum increase in population. Due to intensive grazing, Tusheti's summer pastures ended up in a dire condition. Today, a major part of the Tusheti agricultural area is heavily eroded and fallen to landslides. The situation is particularly severe on arable lands, which have been used as pastures since the Soviet times.

After the collapse of the Soviet Union, the number of livestock in Tusheti has drastically decreased (supposedly from 200 000 to 50 000). Nevertheless, grazing still remains one of the most important factors, which affects the ecological condition of the pastures – in Tusheti in particular and the region in general. A particular problem is brought about unregulated grazing and chaotic herding practice, which has emerged during the past 20 years.

Map 4. Pastures of the Tusheti Protected Areas



In 2003, the responsibility of managing these pastures of Tusheti was entrusted to Tusheti National Park and Tusheti Protected Landscapes Administration. Starting 2014, by the support of the German Gesellschaft für Internationale Zusammenarbeit (GIZ), a study of existing ecological conditions and utilization of pastures was undertaken. Therein, considerably eroded zones were identified, a monitoring of vegetation on pilot pastures launched, and baseline information about pastures were collected to facilitate the development of a pasture management plan. In addition, a digital map and database were created, which includes information about the area, users and livestock populations per pasture.

Now the Tusheti Protected Areas' Pastures Management Plan is being prepared which is based on a model of susceptibility of the Tusheti's pastures towards erosion[15].

Approximately a quarter (11 000 ha) of **Borjom-Kharagauli National Park** is occupied by subalpine and alpine meadows, which have been used as summer pastures for centuries. The pastures are used by the population of villages (of Borjomi, Akhaltsikhe, Adigeni, Baghdati, and Kharagauli Municipalitites) surrounding the National Park. Among them, the Kharaguli Municipality uses the largest share. The grazing period in Borjom-Kharagauli National Park lasts only 3 months of summer. Locals move their livestock to the mountainous areas of the National Park mainly at the end of May and stay there until September. At the end of the grazing season, they use pastures outside the Park.

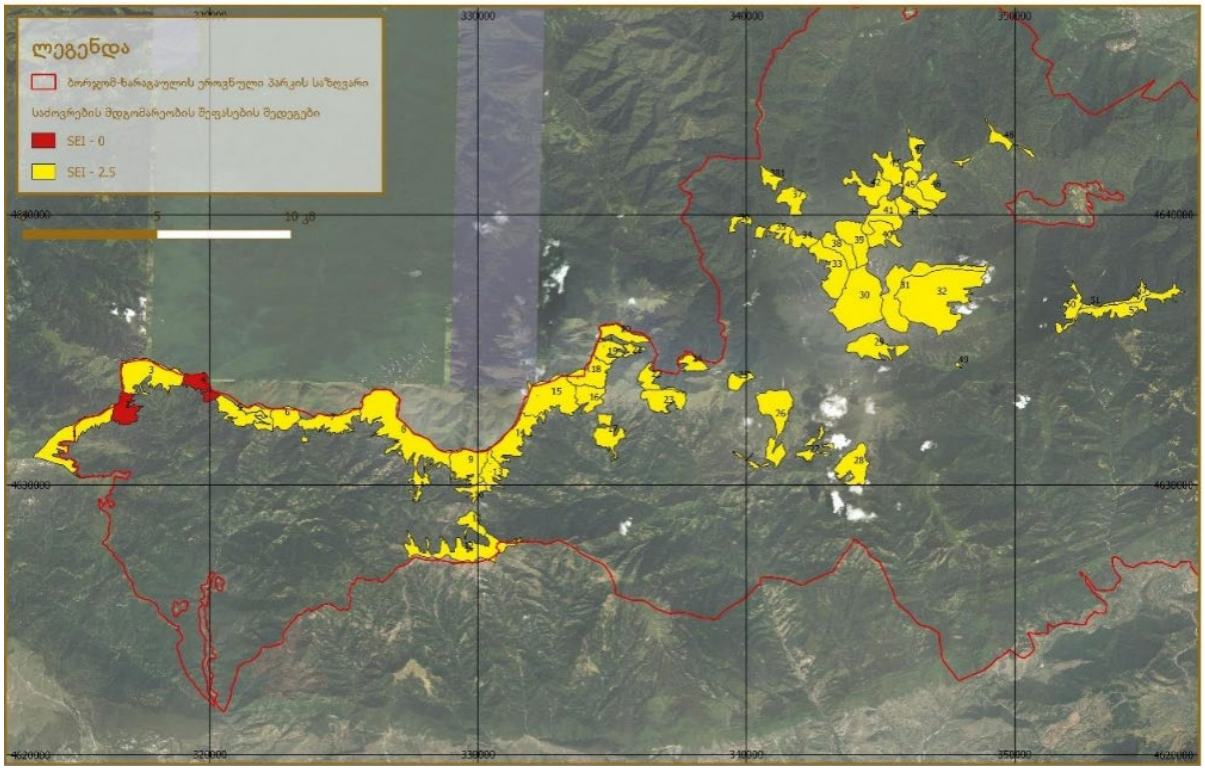
The grazing practice is quite different from other protected areas. In most cases, the shepherds let the livestock graze in the morning without any control and gather them in the evening, at dusk. There are cases when the livestock is not shepherded at all, and it is free to do anything.

According to studies undertaken, approximately 20% of pastures of the Borjom-Kharagauli National Park are in moderate condition, and 29.5% are in good condition. However, the studies

[15] GIS Lab together with the Austrian Company ECO created the model. The Center for Biodiversity Conservation & Research (NACRES) with participation of international consultants was conducting field studies to investigate pastures and has prepared pastures management plan.

also revealed that the pastures in the National Park have a potential of natural erodibility. Approximately 1.4% of the pastures is susceptible to or under the risk of erosion.

Map 5. Erodibility of pastures in Borjom-Kharagauli National Park.



Currently, a pasture management plan of the National Park is being prepared, which should ensure the introduction of practices of sustainable utilization of natural pastures.

An important fact with regard to pasture management is that a major portion of this significant resource falls within the so-called „Emerald Network", the pan-European ecological network aimed at the preservation of biodiversity in Europe. The establishment of this network is one of the requirements of Bern Convention on the Conservation of European Wildlife and Natural Habitats (Bern, 1979). This network is one of the chief mechanisms for the implementation of the requirements of Bern Convention.[16]

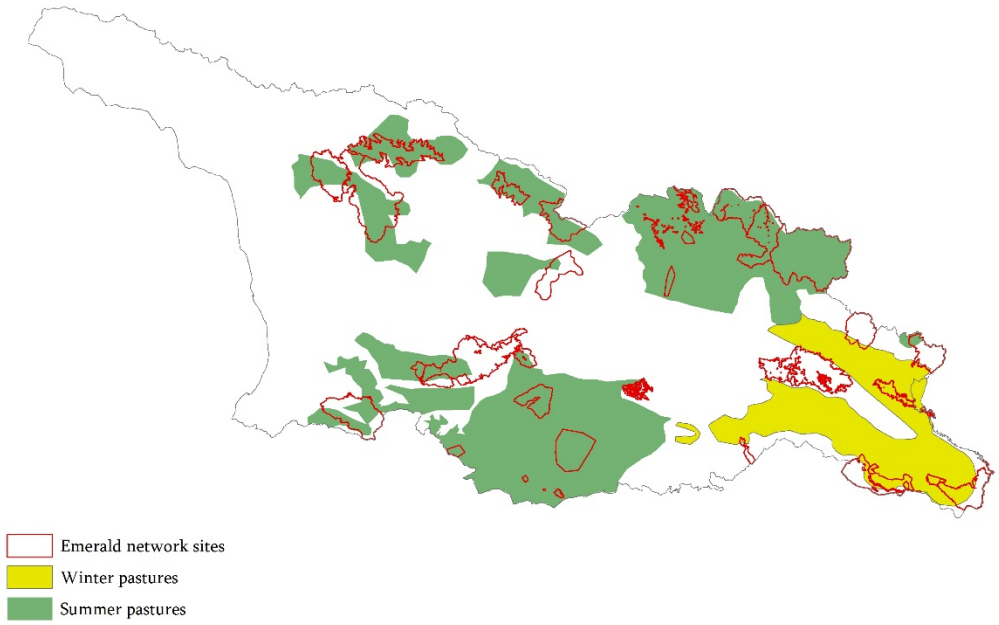
„Emerald Network Sites" are subject to specific, flexible management which ensures long-term conservation of species and habitats under Bern Convention.

The management principle implies the implementation of activities that will ensure "favorable conservation status"[17] of species and habitats widespread on the site. This increases the sustainability of the ecosystem (Council of Europe 2013).

[16] Phase I of the development of the Emerald Network in Georgia began in 2009 and lasted until the end of 2011. NGO NACRES was responsible for the technical implementation, in close cooperation initially with the APA/MoENRP, subsequently with BPS/ MoENRP. As of to date, the following datasets can be traced at the Georgian section of the Emerald Network repository at the address http://cdr.eionet.europa.eu/ge/coltlvahq/coltlvamg.

[17] A favorable conservation status is a situation in which a habitat has sufficient area and qualitative characteristics, whereas a species has a sufficient number which ensures its long-term sustainability even under the conditions of current and potential pressures and threats.

Map 6. Emerald Network and pastures distribution.



Key activities are aimed at:

- Diminishing the existing pressure;
- Preservation of the heterogeneity of the ecosystem;
- Preservation/restoration of the natural hydrological regime;
- Management of fires, floods and other natural calamities;
- Expansion of protected areas, Emerald sites and important bird sites; creation of buffer zones and zones linking the sites;
- Control of foreign and invasive species;
- Integration of climate change adaptation activities in the sectoral policy documents.

4.2. EFFECTS OF CLIMATE CHANGE ON PASTURES

Climate change has an extremely negative impact on hay meadows and pastures. Alpine and semi-arid hay meadows and pastures are especially sensitive to changes in climate. It is obvious that the rise in global temperature will have a strong effect on high montane plant species which are adopted to low temperatures.

With raising temperatures, they are expected to be replaced by thermophilous species, the spreading of which was so far limited by low temperatures. As a result of these processes, serious shifts first in the alpine meadow vegetation and then the subnival communities are expected.

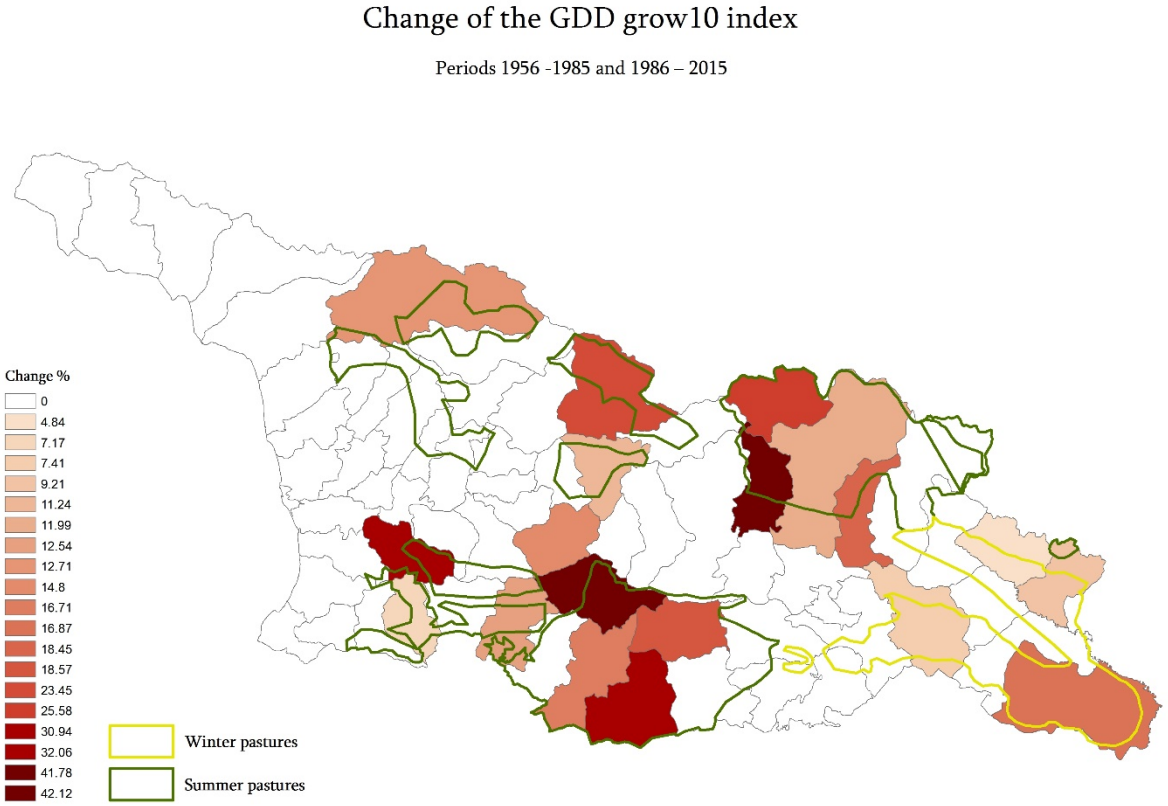
The change in the climate has a significant influence over the factors causing the erosion of natural pastures and grasslands. It is well known that in Georgia the pastures and grasslands of the Major Caucasus are located on complex, fragmented and extremely steep slopes of 10-30

degrees. In some places, the average altitude of these slopes may reach 3500 meters above sea level.

Precipitation, its intensity and periods, play an important role in the development of water-related erosions. Summer pastures are affected by processes of erosion, denudation, landslides and mudflows. The process is aggravated by a highly continental climate, the lack of snow cover and, what is most important, unregulated grazing.

Certain climatic parameters identified in the previous years also prove the possibility of potential changes. For instance, the study of the change in the index of the sum of active temperatures (GDD grow10 growing degree days considering a base temperature of 10 °C (GDD grow10 index)) in some municipalities of Georgia (where both winter and summer pastures are mostly located) has proved that the changes in climate may lead to a change in the quantity of thermal energy obtained from the plants of the pastures (Artsivadze 2019). This parameter conditions the balance of thermophilic plants within the species comprising plant coenosis as well as the speed of their vegetation. All this affects the types of pastures and their capacity to produce the plant biomass necessary for livestock.

Map 7. Change of the GDD grow10 index in some municipalities of Georgia



The effects of climate change on pastures located in different regions of Georgia was assessed under the Second and the Third National Communication of Georgia to the United Nations Framework Convention on Climate Change (UNFCCC) and in preparing a National Plan for Adapting to Climate Change[18] for the Agricultural Sector.

[18] National Plan for Adapting to Climate Change for Agricultural Sector was prepared under Agriculture Modernization, Market Access and Resilience Project (AMMAR) through IFAD/GEF support by Environmental Information and Education Center in 2017.

The following effects of climate change on pastures have been identified by these findings:

In **Dedoplistskaro Municipality**, the ongoing changes[19] in climatic parameters, namely, heavy rains, reduction in provision of moist for plants in April and July, a significant rise of strong winds and reduction (by 15%) of average seasonal values of hydrothermal coefficient, induce the enhancement of erosion process on pastures. It is expected that the average annual temperature of air will have risen by 3^0C and the precipitation will have reduced by 14% in Dedoplistskaro by 2100. The annual sum of precipitation in Dedoplistskaro will have reduced by 4% already by 2050. During the vegetation period, the temperature will have grown by 5 degrees, while precipitation will have reduced by 90 mm, i.e. a stronger aridization of the climate will have taken place. Due to projected climate changes, instead of Artemisia, meadow-grass, brome, and wheatgrass the winter pastures will be dominated by grasswort, salsola and saltwort. This trend has already been observed in the current period. Pastures and hay meadows in denudative-erosive and accumulative landscapes will be close to the desertification threshold. The commonly found bluestem pastures of east Georgia will be under threat, as the vegetation period of the bluestem starts comparatively late (at the end of April, in May) and withers at 35-40^{0}C degrees. Also, the transitional pastures (at 500-1000 meters above the sea level) will be endangered as they will develop under relatively more moist conditions.

The premature blossoming of grass plants and withering while still a bud has been observed on **winter pastures and hay meadows of Kazbegi**. The productivity of the phytomass has been perceptibly decreased (almost twice). A replacement of plants of high nutritional value (purple barley, reed grass, fescues, timothy, clover, alfalfa) by inedible plants (spearwort, lousewort, rattle) in forbs-grain and forbs-legume meadows – which have been used as hay meadows – has begun. The expected changes in climatic parameters of this region is almost the same as in Dedoplistskaro. In particular, it is expected that temperature in 2100 will have risen by 3.2 degrees and precipitation will have been reduced by 14%, which will have led to xerophilization of plants of upper montane and subalpine zones. The vegetation of high mountainous areas, if not heavily disrupted and eroded, will remain its high nutritional value and its area will even grow. Today's eroded slopes will have become more exposed. In order to avoid grave consequence, the eroded slopes in alpine zones should be converted into hay meadows. Owning to effects of expected climate changes, mesophilic vegetation will have moved upwards by 100-150 m and their place will have been taken by steppe plants capable of thriving in drier conditions. From the perspective of pastures such an expansion, will not be too bad.

It is expected that the temperature will have risen by 3 degrees on the **Colchis plain** by 2100. The precipitation will be rising until 2050, but it will have decreased by 12% by 2100. These changes in climatic parameters will have caused a heavy erosion of pastures and extinction of mesophilic pastures. It is expected that swamping of pastures will have risen.

In light of expected climatic changes (the temperature has grown by 0.3 degrees; it will have grown by 1.2 degrees by 2050, and by 3.7^{0}C by 2100) in **Zemo Svaneti**, a significant transformation is being transpired in forb (cranesbills, windflower) pastures, which occupy quite a large area. Their place will have been taken by forest grass plants.

The intensified and frequently large precipitation in **Ajara** cause washing off soils on mountain slopes, which, in light of an intensive exploitation of vegetation, is followed by reduction in productivity of pastures and hay meadows. It is expected that the temperature in Ajaras high mountain zones will have risen by 1.4-1.5 degrees by 2050. Such an increase in the warm period of the year will have a had a positive impact on pastures productivity. A slight reduction in precipitation is expected, which will not have had a big effect on pastures.

[19] Changes in climatic parameters in 1966-1990 and in 1991-2015.

Considering the abovementioned, the National Plan for Adapting to Climate Change for Agriculture Sector recommends the introduction of the following measures for pastures:

Winter pastures of Kakheti

- The load on pastures should be reduced as much as possible. The permissible number of head of sheep per 1 ha of absolute winter pastures should be reduced from 2.5 to 2-1.5, while the autumn pastures should allow for no more than 4 heads of sheep per ha. At least partial shift towards stall-feeding should be facilitated.
- The pastures which allow irrigation by soil conditions (where irrigation will not cause removal of salt from the soil; or the growth of bluestems-artemisia and bluestems) should be irrigated. Transfer of hay meadows and pastures to users.
- Restoration of pastures rotation schemes i.e. not to allow the grazing on the same plots during the same calendar season. There should be one plot designated from the winter pastures which could be used as a food stock for lamb and sheep in extreme cases and under very bad weather conditions (such as extended rain or drought).
- Eroded areas (in Dedoplistskaro: Pantishara, Kotsakura Ridge, Parasi) should be naturalized and improved. To this end, drought-tolerant bark plants, such as junipers, Persian turpentine, buckthorns, and xerophyte grasses should be used.
- Creation of artificial hay meadows by plowing. It is desirable to sew in October in case there is precipitation. To create artificial hay meadows sainfoin, wheatgrass, ryegrass, etc. should be used.
- Restoration of windbreaks.

Pastures of Kazbegi

- At places of plains or slightly steep (<10 degrees) slopes sown hay meadows and pastures with several types of grass should be developed. A 3-4 type grass seed mixture for hay meadows is allowed. The following grain crops from wild plants can be useful: purple barley, fescue, timothy, cat grass; from legume varieties the following can be useful: Caucasian alfalfa, yellow alfalfa, sainfoin, clovers; out of forbs: bistrot, caraway, yarrow. All these plants are local. For pastures to be used for long-term, the following grain crops can be used: brome, alpine timothy, quaking grass, Junegrass; out of legumes: clovers, vetches, lotus; out of forbs: Caucasian caraway, fleaworts.
- Cessation of grazing on erosive slopes and commencement of vegetation restoration works.
- Rotation schemes of 10-plot pastures should be established to have plots grazed after a long pause. For less trampled plots 4-5-plot rotation schemes can be introduced. In both cases, the plots should rest at least for 1 year.
- Heavily degraded pastures should be temporarily removed from utilization; otherwise, a desertification of the pastures will occur, the grass content of a pasture or a hay meadow will completely change and more unpalatable (rough) grass will dominate. Stall-feeding should be employed at least temporarily. Pastures should not be utilized during spring.
- The hay should be made during the optimal period when seeds of grain crops are matured, and legumes and forbs blossom and fruit. Mowing should begin in the second half of July (instead of second half of August).
- It is necessary to seed wild, sometimes grass crops in trampled pastures.
- One of the effective ways to improve hay meadows and pastures is fertilization.

Pastures of Samegrelo-Zemo Svaneti

- It is necessary to shift towards stall-feeding. In consequence, this requires an increase in hay yield and the maximum utilization of hay meadows. During droughts (end of July, August), in the past irrigation on hay meadows and pastures used to be employed. Irrigation channels are still in existence today and should be revitalized. The areas of hay meadows should be expanded; irrigation works should be undertaken in relatively dry valleys.
- Low-productivity hay meadows, which are hard to take care of and make hay out of it, should be used as pastures.
- It is necessary that artificial hay meadows are established.

Pastures of Ajara

- Primary attentional should be paid to optimal loading (stocking) of pastures, observance of grazing periods, letting degraded plots rest for some time, seeding of soil protective and water-absorbing plants.
- To protect and improve mountain and meadow soil, planting of wildly growing medical herbs, especially those whose natural stock has been reduced.

Clipping 2: Vulnerability and resilience[20] of pastoralists thought flexibility and mobility in times of climate change

It is scientifically established that pastoralist lifestyles are not only most sustainable in present times but also most resilient to climatic variability. However, global climate change represents a considerable threat to grassland ecosystems and associated natural resources and affect pastoralists and their livestock though erratic weathers and changing availability of palatable biomass (Arjjumend 2018:2). As shown above in Georgia, particularly winter pastures are affected by climate change.

Yet, research from all over the globe shows that pastoralists hold much of the knowledge about how to adapt to hostile and varying climates and critical ecosystems – for example, by the adoption of strategies such as rotational grazing, division of livestock, diversification of livestock, the prediction of rainfall and seasonal changes etc. Altogether, the basic principle of "risk aversion" makes pastoralist livelihoods practices highly sustainable and adoptive to their environments. However, the key to pastoralism is mobility, which permits for the temporary and flexible use of resources that are not sufficient to sustain a human and herbivore population for an entire year (Arjjumend 2018:2) Hence, mobility[21] and flexibility as important factors of resilience and adaption to climate change needs to be reflected upon in policy making and law.

[20] Resilience and vulnerability are paired terms whose definitions vary greatly in different fields. In general, it is accepted that resilience is broadly the capacity of a system, community, or organization to withstand loss or damage and to recover from the impact of an emergency or disaster (Dong 2016).

[21] According to the report "Georgia- Pastures Policy: Gap Analysis, International Practice and Proposed Roadmap" mobility distributes grazing pressure and helps tracking variability of nutrients at larger scales. Mobility also promotes feeding selectivity in livestock. Livestock capable of feeding selectively target only the most nutritious bites on the range and are thus more productive. Therefore, the most economically successful strategy is also the most ecologically sustainable. This understanding of mobility-based strategies in pastoral production has nullified the economic argument that used to be associated with policies of sedentarisation. Although previously seen as the first step of pastoral development, sedentarisation of pastoralism is now clearly understood to be counter-productive and as a factor contributing in reducing pastoral productivity and ecological sustainability, as well as being problematic for food security, land degradation and even gender. (MoEP/EU/UNDP 2016:7)

For Georgia the concept of Land Degradation Neutrality (LDN) is such a concept that aims at resilience at local, national and regional levels. It focuses on combating the ongoing degradation of valuable land and soil resources as an essential global good – the basis of food security and many rural livelihoods. Soil degradation is contributing to climate change and biodiversity loss. To reduce and reverse this trend is a main objective of the United Nations Convention to Combat Desertification (UNCCD) and part of the Sustainable Development Goals (SDG 15.3).

As for the mobility aspect the UNDP-report "Georgia- Pastures Policy: Gap Analysis, International Practice & Proposed Roadmap" suggests reflecting pastoral mobility in law. Therefore an orientation on "Pasture Law of the Kyrgyz Republic" of 2009 including the following key elements covering mobility: a) delegation of pasture management responsibility to community-based inclusive and representative committees; b) a shift in the system of pasture rights allocation, from area-based to a system using 'pasture tickets' to determine the number of animal grazing days and the grazing routes; and c) integrated management of low, middle and upper altitude pastures to allow better seasonal movement of livestock is proposed. (MoEP/EU/UNDP 2016:7)

5. LEGAL AND INSTITUTIONAL ANALYSIS

5.1 LEGAL FRAMEWORK OF PASTURES MANAGEMENT

After Georgia declared independence in 1991 in the early 1990s a first period of land reforms was implemented. Since then many changes in laws and regulations have occurred. As of now there is no standalone law or regulation that exclusively governs pasture resources and their use in Georgia. However, various laws indirectly deal and regulate pasture resources in Georgia which of course could not be comprehensive and all inclusive. This legacy of past reforms on pastures in Georgian led to privately and government owned pastures.

Under current laws, pastures are not subject to privatization and should be accessed through leasehold contracts (either from the ASP or municipalities). However, large areas of state-owned lands are used informally in particular many village pastures are de facto commonly managed and have no specific legal status.

For the creation of enabling conditions for "Sustainable Pasture Management" an understanding of current laws in place and based on that the consideration of an appropriate property rights framework i.e. "designing new land tenure legislation specific to pastures which recognize the specific ways in which pastures are actually used and managed, rather than simply applying procedures designed for arable land reform" (Robinson 2018: 4) is similarly important as the clarification of institutional roles, responsibilities, arrangements and cooperation, the organizational forms of pasture management, technical instruments but also mechanisms of contract enforcement and pasture monitoring and the fathoming of potentials and constraints of sustainable pasture management.

Pastoral property rights are important as they define which mechanisms and tools are available for management of grazing lands, who is able to access pastures and under what conditions. Since independence, during different stages of the reform process different property types have emerged that can be classed as: privately owned, leased (or subleased) and unleased state-owned pastures. But, not all of them are available to new users today and some arrangements remain only as a legacy of past reforms. The current land tenure situation can therefore best be understood by examining reforms over the past 20 years, which can be divided into three phases (Robinson 2018: 6): the first phase of land reforms comprised a process of active distribution of agricultural land to the population by the state.

The second phase was initiated in 2005 when the law on the Privatization of State-Owned Agricultural Lands defined the rules and conditions for the privatization of additional agricultural land plots by application. Since 2010, the Law on State Property replaced previous legislation and regulates the rules and conditions of the privatization of agricultural land today. In addition to these laws, which principally regulate privatization, additional legislation governing leaseholds and the respective roles of municipalities and the state in the disposal of pastoral property rights have also been crucial in determining the picture we see today (Robinson 2018: 6).

Below, those different phases of land-tenure and ownership, registration, taxation processes and implementations for the use and monitoring of pastures are outlined, anchoring them in a broader framework of environmental regulations and monitoring systems and commitments of the Georgian state in the framework of international agreements and regulations such as the United Nations Convention on Biological Diversity (UNCBD) and resulting National

Biodiversity Strategy and Action Plan of Georgia, or the country´s commitment to the United Nations Convention to Combat Desertification (UNCCD) in which the country has committed to monitor progress towards land degradation neutrality (LDN).

Environmental regulations, pasture use and monitoring systems

General requirements of pastures utilization are defined by the **laws on Soil Protection (1994)** and the law **on Conservation of Soil and Restoring and Improving Fertilization (2003)**.[22]

The law on **Soil Protection** defines the following as soil protection measures: implementation of crop engineering measures for protection, reclamation and improvement of fertility of pastureland soils; improvement of the vegetation cover to prevent erosion; observation of the vertical grazing rules for herds and flocks; prohibition of livestock grazing in quantities exceeding the norm set for high mountain pastures; and introduction of pasture rotation" (as amended on 19.11.2002).

In order to ensure soil protection, the law Article 4 of the law prohibits the deterioration of pasture conditions by improper i.e. uncontrolled and excessive grazing, grazing of livestock quantities exceeding the norm[23] set for high mountain pastures, which cause erosion (19.11.2002 N. 1751). Article 9 defines the responsibility for soil deterioration caused by violating the rules for vertical grazing of cattle herd and flock of sheep on mountainous pastures and by exceeding the maximum allowed headcount number according to legislation of Georgia (19.11.2002 N 1751). In order to meet the requirements, set by the law and to prevent erosion, the following rules were defined: a) rules for vertical grazing of livestock in high mountain pastures b) a maximum admissible quantity of livestock to graze on high mountain pastures. However, these rules have not been further defined, adopted and approved so far; which makes, it is practically impossible to meet the requirements set by the law and to enforce it. Besides, the Law requires setting a maximum quantity (stocking rate) for livestock grazing in high mountain pastures only, without even mentioning winter pastures.

The law of Georgia on Soil Protection, in general, indicates that the responsible bodies for introducing the soil protective measures defined by the law are "state bodies specially authorized for this purpose", but it does not allocate responsibilities and rights among the relevant state bodies. Then, the law grants the authorization to "relevant local state bodies" in municipalities to demand that landowners and land users implement the soil protective measures defined by the law and to control that they observe the law.

According to law on **Conservation of Soil and Restoring and Improving Fertilization**, the following the measures aim at soil conservation and reclamation and improvement of soil fertility include: a) the enhancement of the fertilization of hay meadows and pastures, the improvement of soil fertility of pastures, the improvement of the vegetation cover and implementation of crop engineering measures; and b) conservation and restoration of natural topsoil in high mountains, mountains and foothills and c). the observance of vertical grazing rules for livestock regions to avoid erosion processes. In addition, one of the measures to conserve the soil, improve, and restore fertilization is to establish pastures rotation in high mountain and mountain regions.

The law refers the pastures located in high mountains, mountains and foothills to the areas that require measures for soil conservation, recreation and improvement of soil fertility. Therein,

[22] According to Mansour (2016) this is the only active law regulating environmental aspects of land management (c.f. Robinson 2018: 18).
[23] Norms, however, are not defined legally. According to Didebulidze and Plachter (2002) during SU-times a load of 1 livestock unit per ha was defined for mountain pastures.

pasture rotation in high mountains and mountainous regions is mentioned as one of the tools to addressing the requirements.

The Law states that soil conservation, fertilization restoration and improvement measures, which are related to agricultural machinery and agricultural manufacturing processes, should be implemented on every type of soil (including pastures) by the landowner or land user by their own means. The landowners are obliged to follow the measures of soil conservation, fertilization restoration and improvement. The chemical improvement measures and measures against erosion and desertification on state-owned soils should be financed by the central budget through appropriate programs.

It is the responsibility of the Ministry of Environmental Protection and Agriculture to manage, control, supervise and observe (i.e. monitor) changes in the condition, conservation, fertilization and restoration and improvement measures of soils of agricultural lands (including pastures).

The law on Conservation of Soil and Restoring and Improving Fertilization does not lay out any requirements for lowland (winter) pastures. In addition, it does not require adoption of norms or regulations to ensure a sustainable utilization of pastures.

The enforcement of requirements and prohibitions set forth by the laws on Soil Protection and Conservation of Soil and Restoring and Improving Fertilization is not possible, on the one hand, due to absence of respective norms and rules, and on the other due to absence of fines (they are not defined by the laws) for omission or breach of prohibition. The Administrative Offense Code of Georgia defines the amount of fines violation of rules of grazing in the protected areas and alongside the railway and traffic road. The Code, also, determines the number of fines for not enforcing the measures mandatory for land user for protecting the soil against the soil deteriorating processes (Article 51).

Clipping 4: Pasture monitoring systems – responsibilities and methods

Changes to the Law on Soil Protection passed in **2017** define indicators for the monitoring of soil erosion using the revised universal soil loss equation, and of soil contamination with heavy metals and radionuclides (as defined and measured by the Agricultural Research Centre and National Environmental Agency of the MoEPA). However, this law appears to refer only to arable land. For the moment a methodology to measure erosion is being tested in Shida Khartli by the NEA but has not been expanded to the rest of the country.

Under commitments to the **UNCCD on Land Degradation Neutrality (LDN),** Georgia will be measuring progress through the three indicators of soil organic carbon (SoC), land cover change and productivity (Huber et al., 2017). SoC is to be monitored at the MoEPA, with a soil carbon map currently under preparation. Land cover change and vegetation productivity are to be monitored by the **Land Resources Protection and Mineral Resources Service** at MoEPA but they are currently using generic global databases for these indicators and have not yet implemented national systems based on higher resolution data such as Sentinel (see recommendations of Huber et al. (2017)).

On behalf of GIZ in 2010 a **Monitoring Manual for highland pastures in the South Caucasus** was developed by Etzold and Neudert (2013), which was later extended to lowland winter pasture ecosystems. Since then the approach was applied in numerous trainings and first assessments were implemented in the South Caucasus and Central Asia (e.g. on behalf of GIZ, UNDP, CNF). In Georgia the monitoring manual was adapted by NACRES for Vashlovani Winter Pastures as part of the protected area pasture management plan. Furthermore, the method of the maual has also been used in an adapted version for pasture management planning in Borjomi-Kharagauli protected areas and combined with remote sensing data for Tusheti.

Within the framework of the RECC Project "Assessment of Pasture Condition in Sagarejo Municipality, Georgia" will be tested in Sagarejo municipality in spring/summer 2019 the scaling up the monitoring methodology of estimation of grassland quality under pasturing using multispectral remote sensing data and ground assessment based on the monitoring manual will be teted with the objective to assess the condition of the entire pasture land in Sagarejo Municipality. The assessment furthermore will provide the baseline to identify specific entry points for the LDN indicators at municipal level. Robinson (2018) suggests that the manual with other aspects of protected area planning could be adapted to municipal level processes. Robinson furthermore proposes a potential combination with degradation mapping methodologies by the WOCAT initiative (Liniger et al., 2008) suggested by Huber et al. (2017).

Transhumance routes/ livestock mobility

The Veterinary and Sanitary Rule for herding the animals to seasonal pastures (approved by Ordinance #422 dated December 31, 2013, by the Government of Georgia). The herding of animals on seasonal pastures takes place within the timeline defined by the National Food Agency (LEPL under subordination to Ministry of Environmental Protection and Agriculture). The Agency is responsible to provide veterinary control points on herding routes, to examine the herded animals and the territories nearby the herding route, to vaccinate contagious diseases in animals nearby the territory of the herding route. The owner of the animals should herd the animals and have animal health certificate and in case of disease, immediately notify the Agency or the nearest veterinary check point. As per the rules, there should be resting places for animals for herding period on herding routes and watering places. However, it is not defined who will be the responsible body for implementing these measures.

Neudert et al. (2017) claim that the migration infrastructure for mobile herds in Georgia generally lacks regulation. On one hand, because veterinary controls are not implemented properly on the other hand because official migration roads are sometimes blocked by private land.

Pasture use in Protected Areas

In frequent cases, the hay meadows and pastures in Georgia are lightly modified natural territories. Therefore, a certain part thereof is under protected areas established as per law of Georgia on **System of Protected Areas** (1997). According to this law, the grazing is allowed in conventional zone of the National Park, Managed Reserve, as well as, in Protected Landscapes and territories of various designations.

In accordance with the law, it is permitted to lease agricultural land (hay meadow and pasture) in conventional zones of the National Park and in individual zones of the Managed Reserve to local population on the basis of application of the local Self-Governing Body and in compliance with management plan or temporary regulatory rule, and the Civil Code of Georgia for no more than 10 years. Hence, the Agency of Protected Areas (legal entity of public law under Ministry of Environmental Protection and Agriculture) has a right to lease pastures in agreement with the municipality.

In conformity with the individual management plans of protected areas, which have been approved as a technical regulatory rule, it is required to develop and introduce management procedures or management plans for pastures found in protected areas.

Clipping 5: Examples of leasehold agreements with livestock owners in protected areas including management obligations

- Vashlovani protected area: Leasehold agreements include set stocking rates based on detailed vegetation assessments, use of manure for fertiliser and obligations to use planned grazing strategies in partnership with the park authorities (Nacres 2015).
- Javakheti, Borjomi-Kharagauli and Lagodegkhi protected areas pasture management plans. But these are not publicly available.

It has been suggested that experience gained by the APA in pasture management planning could be applied to other parts of the country (Robinson 2018: 18).

Pasture use on the territory of the State Forest Fund

Pasturelands are also represented on the territory of the State Forest Fund. According to the Georgian Statistical yearbook of Forestry, 2006, there are 41 884 ha (1,6% of the forest fund) of pastures within the State Forest fund. There is no more updated data about pasture areas within the State Forest Fund. According to the Forest Code of Georgia (1999), pasturelands are regarded as agriculture lands and their use is regulated by the Forest Use Rules adopted by the Government of Georgia in 2010 (Decree #242). According to the Forest Use Rules, agricultural lands, including pastures within the State Forest Fund can be leased for no more than 20 years by the state agencies responsible for Forest Governance. According to the Forest Use Rules (Article 57) the use of pastures within the State Forest Fund should be carried out in a manner that does not harm the plants, does not damage timber plants and does not cause erosive events. In addition, the Code of Food / Veterinary Safety, Veterinary and Plant Protection and the requirements of Government Decree No. 198 on Organic Farming shall be adhered.

Despite existing regulations, in practice the National Forest Agency, as state agency responsible for Forest Governance, did not leased any pastures during the last 15 years.

The Georgian Parliament is currently considering a new draft of the Forest Code, which takes into account the vital interest of the local population and, on the other hand, the adverse effects of excessive grazing (deforestation) and sets out the possibility of using areas suitable for grazing in the state forest, except where the functional purpose and condition of the forest does not allow grazing. The designation of grazing areas and limits will be based on forest management plans and appropriate information signs should be placed in the area allocated for cattle grazing.

Sustainable Use of State-Owned Grasslands and Pastures in High-Mountain Regions

The Ordinance #265 of the Government of Georgia approved **State Program for Rational Utilization of the State-owned Pastures and Hay Meadows in High Mountain Regions** in May 2017 which is being financed via a fund[24] for development of high mountain settlements. LEPL Agricultural Cooperatives Development Agency (CDA) is implementing the program. Under the program, the state-owned hay meadow and pastures are leased to participant for 25 years (for 10 years in conventional zones of the National Park and in Managed Reserve).

The program aims to strengthen the capacity of the farmers involved in dairy production through agricultural co-operation, increase their incomes and produce high quality and safe dairy products. The objective of the program is rational use of pasture, livestock feed, support for the

[24] The Fund for Development of High Mountain Settlements was founded under the law of Georgia on Development of High Mountain Regions.

creation of a production cycle for the production and sale of milk and dairy products within the cooperative, and thus generate added value.

Clipping 6: An experiment on cooperative pasture management

The CDA selected 29 municipalities in mountain areas having relatively high populations for the implementation of the State Programme on Rationale Use of Pastures. Cooperatives across the selected communities were invited to bid for a total of 39 projects, which include both land allocations (by leasehold) and grants for livestock production. Thus, each cooperative will have two contracts – one with ASP for the land, the other with the CDA for a grant. The programme is aimed at cattle production, most specifically at dairy farms, and works *only* with cooperatives.

The main criteria for eligibility are as follows:

- There is a minimum of 11 members per cooperative.
- The cooperative should have at least 200 cows between members.
- They should request a specific area of pasture which is large enough so to allow at least 1.5 ha of grazing per head of cattle and not more than 4 ha.

Conditions of the agreements include:

- There is no auction for this pasture, the selected cooperative will automatically receive a leasehold for pasture if they are selected for the programme.
- Cooperatives are not allowed to sublease to others, a condition monitored by the CDA.
- The lease period is for 25 years.
- Pasture rents are 15 GEL/ha and land tax is16 GEL/ha, but under this programme, for the first two years the rent is 1 GEL per ha only.
- In five years, the cooperative commits to double the number animals owned.
- The grant includes equipment for hay production, such as balers. The recipients must finance 10% for the cost of the equipment, the rest is a grant from state.

39 cooperatives are participating in the program, which have been granted 12337 hectares of pastureland on the basis of contracts with the National Agency of Property. The total number of the cooperative 's members involved in the programme is 11553 people, owning 9096 cattle.

The cooperatives participating in the program were given 25-year leases of state-owned pastures on preferential terms: the annual lease value is 1 GEL per 1 ha in the first and second years, and 15 GEL per 1 ha in the third and subsequent years.

Roads to the pastures should be rehabilitated by the Ministry of Regional Development and Infrastructure of Georgia.

Participating cooperatives were given agricultural equipment needed for the production of cattle feed. 90% of their value is a grant awarded by the state, while 10% of co-financing is provided by the respective cooperative.

Within the framework of the mentioned program, in 2019-2020, milk processing plants will start operation in 4 municipalities (Dusheti, Tsalka, Dmanisi, Akhalkalaki).

Land tenure legislation and property rights

During Soviet times, the land in Georgia was owned only by the State. Land reform in Georgia began in 1992. Based on the Ordinance #48 of the Government of Georgia. citizens of Georgia received agricultural land parcels up to 1.25 ha free of charge for inheritable lifetime use. The land parcels were distributed among citizens based on simple handover agreements (Acceptance Acts). This first phase of land reforms comprised a process of active distribution of agricultural land to the mostly rural population[25] by the state and lasted through 1992-1998.

The privatization of agricultural lands continued after 1998. But now land parcels were transferred to leaseholders, who leased them from the State for a one-time token payment.

True private ownership of land, the buying and selling, parcels legally became possible only after the passage of the **law on Ownership of Agricultural Lands** which was adopted in 1996. The law defineდ an agricultural land parcel as a land which has been registered as an agricultural land at Public Registry and which is being used for making crops and animal products, as well as, a share of a household in the pastures, hay meadows, forests of a village, community and legal person. The same year a **law on Land Registration** (now annulled) and the **Civil Code of Georgia** were adopted. According to these laws, a land is considered as private property if it is registered at Public Registry. Therefore, selling, leasing, mortgaging a land is possible provided that a land plot with ownership rights has been registered at the Public Registry.

The Law on Agricultural Land Ownership, adopted in 1996, was replaced in June 2019 by a new law with the same name, according to which the pasture land still belongs to the category of agricultural land, which may be owned by the state, an autonomous republic, a municipality, citizens as well as by a legal entity of private ownership registered in Georgia. The law also regulates land ownership by non-citizens of Georgia. According to the law, state-owned agricultural lands (including pastures) that are not subject to privatization are defined by the Law on State Property discussed below.

The new Law on Agricultural Land Ownership also establishes the so called Georgian State Fund for the Financing of Land Market Regulation, Land Use and Protection, and Land Improvement Measures. The state budget is the source of funding. The State will be entitled to redeem agricultural land through the State Trust Fund.

In 1996, a law on **Leasing Agricultural Land** was adopted which was subsequently annulled by the This law stated that the hay meadows and pastures with crops were subjects to lease. Therewith nomadic pastures and hay meadows could be leased to on the basis of a permit of the ministry of Food and Agriculture.

The second phase of privatization was initiated in 2005 with the Law on Privatization of State-Owned Agricultural Land which defined the rules and conditions for the privatization of additional agricultural land plots by application. Therein, applicants could apply for the privatization of agricultural land either thought direct sales or auctions, administered by two governmental levels: 1. (todays) Ministry of Economy and Sustainable Development; and 2. The *Sakrebulo* administration (Robinson 2018).

After the adoption of this law, the leasing of agricultural land was prohibited. It explicitly stated that those lands subject to privatization were not to be leased. In the same time several types of land – including pastures – were excluded from most forms of privatization under Article 2 (3) of the law and thus continued to be leased out by local municipalities on behalf of the state. (Robinson 2018) Though, an exception was privatization by the direct sale of already leased land, which was applied to pastures (leased before July 2005) from 2007 to 2011 (Gvaramia 2013).

[25] The land was mostly distributed to persons permanently living in rural areas and employed in agriculture. However, other rural and urban residents were also eligible for smaller amounts of land (Gvaramia 2013, cited in Robinson 2018).

Today, the legal aspects of leasing (renting) of agricultural lands, including pastures, is regulated by the **Civil Code of Georgia.**

The 2005 law on **Privatization of the State-owned Agricultural Lands** prohibited the privatization of pastures in Georgia. This law was abrogated by the 2010 law on **State Property**. However, the latter maintained the prohibition of privatization of transhumance routes and pastures in force. According to the law adopted in 2010, it is possible to transfer pastures leased to before July 30, 2005 into private ownership, as well as pastures, with private or state facilities (buildings) on it.

A deadline for leaseholders was attached to this privatization process according to which they had to apply before May 2011. Since then there was no legal process for pasture privatization, unless the land could be re-designated as another type of agricultural land, that allowed for privatization (Raaflaub and Dobry 2015).

Under the law, all state lands are administered by the Agency of State Property (ASP)[26] under the Ministry of Economy and Sustainable Development. But even before, in autumn **2006** when the **Organic Law of Georgia on Local Self-Government** entered into force, district *Gamgeobas* as local self- governance bodies were annulled, so they could no longer act as intermediaries between leaseholders and the state nor dispense new leasehold contracts on state lands. Instead the Ministry of Economy and Sustainable Development became the sole dispenser of leaseholds contracts (Robinson 2018). However, municipalities could still lease out land (including pastures), registered to them as "municipal lands" (between 2006 and 2010).

The registration of municipal property, was brought to a halt following an amendment to the Organic Law in 2010 and was confirmed recently in Paragraph 2 of Article 107 of the **Local Self-Government of Georgia** adopted in 2014 by in indicating that agricultural land (including pastures), which is private property or registered as state property shall not be considered as the property of a municipality. Paragraph 3 of the same Article, however, allows municipalities to apply to the Public Registry for agricultural land (including pastures), lying within their territory, that is yet unregistered.

In accordance with the organic law of Georgia on the **Local Self-Government Code** adopted in 2014, privately owned land, and land registered as state property, pastures, transhumance routes, and agricultural land located in 500 meters from state border are not considered as municipal property. addition, according to the law, both the municipality and the state can register agricultural land located at the municipality territory. However, it is not clear whether this norm applies to pastures.

According to the legislation, from 2005 to 2010, driving routes for livestock, agricultural lands and found within 500meter-long borderline and agricultural lands which were subject to privatization (while pastures have been excluded) were not a local self-government property.

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[26] ASP, inter alia, exercise the following two main functions:
Management and Disposal of State Property: Inventorying and registering the state-owned property. Transferring the property into temporary possession, writing it off, selling, mortgaging, pledging and encumbering with other forms as provided for under the Civil Code of Georgia, registering real property with the Public Registry, taking relevant measures related to the transfer of the state property into gratuitous possession, transfer of the self-government unit's property (fixed (unalienated) and support) into ownership and possession, develop proposals on issuance of an approval when writing off the amortized or unused fixed assets entered on the balance sheet of the legislative, executive and judiciary authorities, legal entities of public law, other budgetary organizations, as well as Georgia's diplomatic representations and consulates and when disposing the property obtained after writing it off.
Disposal of State Property (Privatization, Transfer with the Right of Use): Privatization of immovable and movable property, intangibles through electronic and/or public auction, direct selling, competitive direct selling and gratuitous transfer by an agent, third party, as well as purchase of ownership right by natural or legal entities or their unions on state property of shares or stocks or certificated shares directly or through agent, public or private offering, or other forms of offering in accordance with the practice applicable for that specific time on foreign country's recognized stock market or international markets, transfer of state-owned shares and stocks with the right to manage to natural or legal or other entities.

Hence, when pastures were added to this list before 2010, the law did not explicitly prohibit the registration of pastures located on the territory of the local self-governments. This is the reason why only approximately 2-5 % of pasture lands are owned by municipalities.

In 2019 another new law "On determination of Land categories and Sustainable Management of Agricultural Land" was adopted, which also applies to pastures. This law repealed the law adopted in 1997 "On the Use of Agriculture Land for non-agricultural Purpose and Compensation of Damage Cause". The new law defines Pasturelands and Mowing areas as a term. According to the law: Pastureland is Agriculture land with or without buildings on them; covered by grass and/or shrub vegetation; natural or cultivated, which is used for grazing; with or without building; or land which can be used as pasture due to the their soil, climate, nature features.

A mowing Area is Agriculture land; natural or cultivated; covered by grass or/and shrub vegetation, which is used to produce feed for livestock; or land which can be used as mowing area due to their soil, climate, and natural features.

Based on the law a new unit as legal entity of public law will be established within the MEPA – National Agency of Sustainable Management of Lands and Monitoring of Land Use. The responsibilities of the new national agency will be agriculture land accounting, the development of databases, the planning of measures to combat desertification, the restoration of topsoil, the management of windbreaks, and to produce land use maps.

According to the law changes of the land categories from agricultural land to non-agricultural land and vice versa are allowed. Pasturelands also can be used as arable land or for orchards. However, all changes in the land category (land use) shall be registered in the Public Register and relevant compensations shall be paid if agriculture land will be used for non-agriculture purposes. Rules for changing land categories will be defined by the Government of Georgia.

Clipping 7: Summary of current property rights options on pasture

- **Pasture may not be privatised**[27]**,** but there is a known practice of converting pasture to arable land which may then be privatized by auction;[28]
- Despite seemingly contradictory clauses in the 2014 Organic Law, the interpretation of government bodies is that **municipalities cannot register pasture at the present time**;
- **Pasture may be leased only from the Agency for State Property or from certain municipalities** which successfully registered pasture as municipal property between 2005 and 2010;
- There is **currently a *de facto* moratorium on leasing from the ASP.** [29] (Robinson 2018:12)

[27] Some leaseholds made on state pastures through municipalities when these administrated state lands may also remain. There is disagreement as to how much pasture has actually been formally transferred to users since the ASP took over administration of state lands, but all stakeholders agree that there is a moratorium on provision of leaseholds on pasture at the current time (Robinson 2018:12).

[28] It is unclear how much pasture has been privatized in this way.

[29] All interviewees with whom Sarah Robinson (2018) spoke for her legal and institutional analysis, confirmed that no new leasehold contracts are currently being issued by the state and it seems highly likely that few leaseholds are being issued by municipalities either. Interviewees and published sources differed widely in their assessment of how long this has been the case. Some say no leasehold contracts have been issued since 2006, others state that it has been 2 years since any were issued (Robinson 2018:12).

Clear conditions and appropriate compensation for changing land categories, including pastures are particularly important now, when they are increasingly threatened by development projects including the energy sector and mining. It is also important to ensure transparency in the decision-making process and to involve the public, especially local communities and to take their interests into account.

Land Registration

In Georgia, according to the law on **Public Registry** (2008) pastures belong to the category of agricultural land.

The law determines the organisational and legal basis for maintaining the public registry and the rights and duties of the Legal Entity under Public Law (LEPL) of the National Agency of Public Registry (NAPR), which is a legal entity of public law subordinate to the Ministry of Justice. created in 2004 and responsible for maintaining the public registry.

In line with the law on Public Registry, a land plot can be registered as either as agricultural or non-agricultural land parcel. An agricultural land plot in turn can be assigned a specific category – pasture, hay meadow, arable land under perennials, orchard, and vegetable garden) in accordance with the evidence supporting the ownership right.

If the supporting document does not specify the designation of the land and/or the category of the agricultural land and its content is not sufficient to establish the designated purpose of the land from the document, then such land is registered based additional information about the designation of the land and/or the category of the agricultural land or on the basis of the application of the concerned party.

Changes in the category of land from agricultural to non-agricultural, should be registered in the Public Registry. Though, instructions on the Public Registry (adopted by the Order #4 dated January 15, 2010, of the Minister of Justice of Georgia), only sets out the grounds and procedures for changing the land category from agricultural to non-agricultural. The basis and procedure of changing the category of agricultural land itself (for e.g. changing the category of a pasture into the category of arable land) is not defined.[30] As stated by these Instructions, an agricultural land (including pasture) or parts thereof can be turned into a non-agricultural land in the following cases:

a) Public necessity;

b) There is an evidence-based necessity to change a state-owned or municipality-owned agricultural land into a non-agricultural land;

The registration process of agricultural lands began in 1999, when the Government of Georgia began to issue registration documents supporting ownership rights to landowners. The document was a handover document issued to citizens by the local self-governing units (village *Sakrebulo*). In some cases, the document would bear the seal of the State Department of Land Management in other cases not, and in yet other cases citizens did not receive handover documents at all, although such agreements can be proven by application to the Archive Unit of the relevant municipality (Gvaramia 2013). Nonetheless, several millions of ownership registration documents were issued, but land plots were surveyed with simple tools, which resulted in significant deviations in land borders. In 2004-2006, the survey of land plots with precise tools became mandatory. Today, land plots can be registered or sold only after having been precisely surveyed (in UTM coordinate system).

[30] However, according to the "Environmental Impact Code" (2017), a screening is required for projects for the use of uncultivated land (more than 10 ha) for intensive agricultural purposes to decide conduction of EIA for such projects.

From 2012 The National Agency of the Public Registry began the systematic primary registration of agricultural lands and their borders, with the aim that all previous land documents should be converted to nationally registered titles. However, according to the Ministry of Agriculture of Georgia (2015), by 2015 only 20-30% of the private and leaseholds contracts on agricultural lands had been officially registered. At the same time the ASP is conducting a full inventory and survey of state lands. So far, the inventory of parcels and their boundaries is complete, but their categorization into the three official types of agricultural land – arable, pasture and hay land – is ongoing (see Law of 2008 on the Public Registry for legal definitions above).[31]

Clipping 8: Summary of the current land registration status

- At present, **registration and sale of land parcels is possible only after their measurement with precision instruments** (using the UTM system).
- State land inventory (of parcels and their boundaries) is complete, but categorization is ongoing.
- **Owners of agricultural lands (including pastures) can be divided into three groups** by land registration status:
  1. Landowners, whose land parcels were precisely measured and registered in the Public Registry;
  2. Landowners, whose land parcels were registered in the Public Registry, but measurements were conducted with crude instruments and need correction;
  3. Landowners, whose land parcels have not been registered in the Public Registry, but who have documents certifying their ownership rights.

Land Taxation

The obligation of paying tax on agricultural land was established in 1995 by the Order #398 of the Head of the State dated December 18, 1994. In 1997, the obligation to pay land tax was defined by the Tax Code of Georgia.

Today, land tax in Georgia is called "property tax on land", which is a local tax paid to the local budget, established by the Tax Code and approved by a regulatory act (within the rates set out by the Tax Code) of a representative body of the local self-government.

Property tax is paid by the person, who owns land within the territory of Georgia, but also by a person, who legally uses land or de facto owns state-owned land (without respective document and/or unpermitted utilization). The legal utilization (rent) of the state-owned land does not exempt the user/leas of obligation to pay land property tax. So, a person who rents an agricultural land pays land property tax together with rent fee.

A person has to pay a land property tax when a land utilization or land ownership right arises; in case of de facto ownership of the state-owned land – in the month following the one when a person became a de facto owner.

A basis for charging land property tax is an ownership document, lease (renting) agreement or other document proving a right to utilize land or a de facto ownership of the state-owned land.

The amount of the land property tax on agricultural land does not depend on the results of economic activities of the payers. A basic annual rate of tax is differentiated by administrative-territorial units and degree of land quality. It is determined by calculated price for one hectare in GEL.

[31] Thus, it is not possible to know how much unregistered state pastureland exists at the present time. (Robinson 2018:12).

The Tax Code sets minimum and maximum threshold rates for arable lands, lands with perennials, as well as, for natural pastures and hay meadows by administrative-territorial units. The land property tax rates for a specific land plot is defined by taking into account the land degree and land location based on the representative bodies of local self-governments. Moreover, this rate cannot be 50% less and 150% more than basic rates.

The natural pastures and hay meadows are divided into two categories: hay meadows and pastures and cropped hay meadows and pastures. The Tax Code sets maximum rate of 16 GEL and minimum rate of 5 GEL per hectare of pastures (Akhmeta Municipality). In case of hay meadows, the maximum rate is 20 GEL, and minimum – 16 GEL.

It should be noted that land property tax per hectare of arable land, including land with perennials, orchard, garden, as well as, croft, ranges from 56 GEL (in high mountain municipalities of Shuakhevi, Kharagauli, Chiatura, Lentekhi, Oni, Chokhatauri, Mestia, Stepantsminda, Java) to 100 GEL (Tbilisi).

The state-owned, unused hay meadows and pastures are exempted from land property tax.

Leasing of agricultural land

Article 36 1 under the Law on State Property 2010 Article 36 1 states: State property shall be transferred by auction to a natural person or a legal entity under private law for consideration, for any form of use determined by the Civil Code of Georgia and with the consent of the property administrator, by the state body, by the body of the Autonomous Republics of Abkhazia and Adjara, by the local self-government body or the legal entity under public law to which the property has been transferred for use or which has the given property on its books. Unless the state property has been transferred for use, it shall be transferred for use to a natural person or a legal entity under private law by the property administrator according to the established procedure. Article 36 11 states: A state-owned agricultural land plot may be transferred for use to natural persons and legal entities under private law for a maximum term of 49 years, except for the cases determined by law.

In terms of costs and management, resolution No. 15 of the Government of Georgia of 13 January 2011 identified the base amount for lease of pastures. It was first determined to be GEL 25 per hectare and reduced in June 2012 to an initial asking price set at GEL 15 per hectare.

However, according to Robinson (2018), as was the case from 2005 to 2010, it appears that very few lease contracts have been issued since 2010. The authors interviews with the NAPR, ASP and Dedoplitskaro municipalities suggest few leases following 2010 and none at all since 2012. Possible factors behind the lack or low number of leases may include:

1. From the side of potential lessees: bureaucratic barriers such as the inability or unwillingness to participate in open electronic auctions, and the price of pastureland. The minimum price of GEL 15 per hectare must be added to local land taxes which are of a similar order, leading to per hectare prices at a minimum of 30 GEL or €10 equivalent. Given that livestock raisers must typically lease several hundred hectares of pasture, this is considered to be very high relative to typical profits from extensive livestock raising and is a particular burden for those subleasing, who must therefore pay much more than this amount (ELKANA, 2014). Despite these issues, both interviewees and published sources report that demand for formal leaseholds is very high in some regions

2. From the side of the lessor: Gvaramia, writing in 2013, noted that the state was unable to dispense pasture for lease as "there were no regulations to transfer state-owned pasture into use and, more specifically, there is no option of electronic auction". The ASP told us that leaseholds were issued following 2010, but that they are not issuing any for the

moment as they are still conducing land categorization and are also reconsidering the leasing system as a whole (Robinson 2018: 10).

3. On summer pastures, where there is a surplus of grazing resources relative to demand, a further reason for not leasing is that most users may be satisfied with their current informal situation. On winter pastures, the high pressure in terms of animals per hectare and limited area of these pastures, which are a bottleneck for extensive livestock production in Georgia, may increase pressure to lease, but this cannot be confirmed with the statistical data available.

Spatial Planning

In July 2018, the law on **Spatial Planning, Architectural and Construction Activities Code of Georgia** was adopted, which will have entered into force in June 2019. The Code legally regulates spatial planning in the territory of Georgia. As specified by the Code, the spatial planning is undertaken at national (Spatial Planning Plan of Georgia), autonomous republics (Spatial Planning Plan of Autonomous Republic) and municipal (Spatial Planning Plan of Municipality) level. The Code defines the following spatial categories: settled area, agricultural territory, natural landscapes, and other territories. As it has been mentioned above, pastures belong to agricultural territories as stated by the law on Public Registry. Agricultural lands are identified at national and municipal levels. Ministry of Regional Development and Infrastructure is responsible for developing the Spatial Planning Plan, and it is approved by the Government. The municipalities are responsible for developing Spatial Planning Plan for space within the administrative borders of the municipalities. It is possible to develop a municipal spatial planning plan with agreement of several municipalities. The Master Plan will regulate land utilization in municipality territory and will identify agricultural territories together with other territories. Even so, it is not required to identify natural pastures and hay meadows within the agricultural territories and to plan the further development of these territories.

5.2 PASTURES MANAGEMENT POLICY AND STRATEGIES

The Strategy for Agricultural Development in Georgia 2015-2020 (approved by Ordinance #167 dated February 11, 2015, of the Government of Georgia) identifies the following challenges concerning pastures management:

- There is no responsible entity for rational utilization of pastures commonly owned;
- Inadequate management of pastures leads to low milk productivity and small weight gain;
- There is an acute problem of controlling invasive diseases on pastures commonly owned;
- There is no land balance. It is not clear what is the area and distribution of agricultural lands and state-owned and privately-owned agricultural land, which, in turn, complicates the planning of measures to be implemented to develop agriculture.

To solve these problems Agricultural Development Strategy envisages the following measures:

- Introduction of a system analogous to land utilization geo-information system (LPIS – Land Parcel Identification System – used in the EU Member States);
- Study of natural pastures and hay meadows and conservation of species biodiversity, diversification of new feed crops and production of ecologically safe food;

- Introduction of measures to hone agrarian ecosystems and natural pastures and hay meadows to perfection.

The Rural Development Strategy of Georgia 2017-2020 (approved by the Ordinance #631 dated December 30, 2016, of the Government of Georgia) states that pastures utilization practice in Georgia took an unsystematic and irregular way in the 90s. In consequence, their degradation became intensive. "Today, conditions of pastures in many regions are on critical path and they require adoption of urgent measures to avoid irreversible processes", states the Strategy.

Among the main challenges before the country are found the following:

- The legislation does not define institutional framework of sustainable utilization of common pastures;
- There is no control on utilization of common pastures of villages and there is no observance of principles of sustainable management of pastures.

The Village Development Strategy considers an excess grazing a significant threat to forestation, semi-arid and alpine ecosystems, and to natural populations of relative wild species of crops.

Village Development Action Plan 2017 envisaged only one measure for pastures, viz. an assessment of condition of and development of sustainable management plans of pastures in the territories of the Vashlovani, Lagodekhi and Tusheti Protected Areas.

On December 27, 2017, the Government of Georgia adopted Village Development Strategy Action Plan 2018-2020. The document includes 69 specific actions, and its total budget exceeds 1.7 billion GEL. Concerning the pastures, the document foresees only one action, i.e. rational utilization of the state-owned pastures and hay meadows found in high mountain regions, which implies construction and equipment of dairy factory for cooperatives in Ukanapshavi Administrative Unit.

Natural pastures and hay meadows while comprising 23% of the whole territory of the country are the most important and integral part of Georgia's biodiversity. That is why these ecosystems attracted a special attention in **Biodiversity Protection Strategy and Action Plan 2014-2020** (approved by the Ordinance #343 dated May 8, 2014, of the Government of Georgia). The document identifies the following problems related to management of natural pastures and hay meadows:

- The legislation and the state programs do no define institutional frameworks of sustainable utilization of common pastures which find their expression in unorganized and unsystematic grazing.
- The degradation of natural pastures was expedited by irregular, improper privatization and leasing coupled with lack of farmers' knowledge and absence of control mechanisms of commonly owned pastures.
- The State does not possess relevant regulations and mechanisms to ensure control of utilization of commonly- and privately-owned pastures, to promote compliance with sustainable management principles of pastures and planning and implementation of holistic measures of fertilization enhancement.

This document defines 21 National Goals – share of Georgia in achieving goals of IT biodiversity. NBSAP sets forth 2 national goals concerning the pastures:

National Target B.1. By 2020, the negative factors affecting natural habitats under threats will have been significantly reduces by having ensured sustainable management of at least 60% of

these habitats (including, at least 60% of forest fund, 80% of water-abundant territories, 70% of pastures and hay meadows).

National Target B.4. By 2020, management and conservation of agrarian ecosystems and natural pastures and hay meadows will have been improved.

To achieve these abovementioned targets, the NBSAP envisages the implementation of 14 actions:

B.1-o1.5 – preparation and approval of national manual of pastures management.

B.1-o2.5 – assessment of pastures loading on forest habitats at regional and national levels;

B.1-o2.6 – introduction of sustainable and modern systems of pastures management in pilot territories and nearby forests; demonstration of ways of reduction of grazing loads; facilitation of introduction of successful systems at national level;

B.3-o2.3 – implementation of 3 pilot projects for restoring especially contaminated/degraded pastures and implementation of 6 pilot projects for restoring especially contaminated/degraded agricultural/household soils in selected municipalities;

B.4-o1.1 – introduction of relevant changes into legislation of Georgia to determine bases of sustainable management of pastures and responsible bodies;

B.4.-o1.2 – development of conditions of privation or leasing of the state-owned pastures;

B.4.-o1.4 – development of model to integrate issues of management of agrarian ecosystems and natural hay meadows and pastures into strategic documents of regions and into annual action plans of municipalities;

B.4.-o1.5 – introduction of issues of sustainable management of agricultural ecosystems and natural pastures to at least 3 regional strategies and annual action plans of 6 municipalities;

B.4-o1.6 – development of sustainable management plans of pastures in protected areas;

B.4-o2.1 – implementation of pilot projects of sustainable management of natural pastures in at least 6 selected municipalities by using specially developed certification/marking schemes;

B.4.-o3.1 – assessment of ecologic condition of agricultural soils and natural hay meadows and pastures of Georgia and identification of "especially degraded and contaminated zones" and "high risk zones";

B.4-o3.3 – inventory of the state-owned hay meadows and pastures.

The problem of degradation of pastures is meticulously discussed in **Third National Program of Environmental Actions of Georgia** (approved by the Ordinance #1124 dated May 22, 2018, of the Government of Georgia). The document considers an excess grazing one of the important threats to species and habitats, and particularly to forest ecosystems. Therefore, to reduce loads on forests the document sets regulation of livestock grazing in the forest, allocation of grazing places and determination of relevant limits and regimes as one of the measures. The document views excess grazing as an important factor contributing to soil erosion, especially in semi-arid zone of east Georgia. However, the document does not define specific measures to normalize pastures utilization.

The Second National Program to Combat Desertification for 2014-2022 (approved by the Ordinance #742 dated December 29, 2014, of the Government of Georgia) meticulously discusses pastures degradation problems and causes thereto, such as excess and uncontrolled grazing. The Strategy calls for development of norms of utilization of agricultural lands, including definition of maximum amount of livestock per hectare of pastures, development of methodology for pastures management plans based on internationally recognized approaches of

integrated management, and sharing of sustainable management practices among farmers/sheep farmers.

Achieving **Land Degradation Neutrality (LDN)** by 2030 is one of the priorities of the Georgian government in order to achieve SDG´s (11-15) and an objective of the United Nations Convention to Combat Desertification (UNCCD). Number four of the National Land Degradation Neutrality Targets, indirectly refers to pastures, by the following setting the voluntary target that "degraded land will be rehabilitated."

The Rural Development Strategy 2014-2021 discusses degradation of pastures as a result of unsystematic grazing as an important problem in all the regions of Georgia. Therefore, this Strategy calls for achieving the following objectives in terms of pastures: inventory and assessment of conditions of pastures, development of pastures management plan, rehabilitation of access roads to pastures. **The Rural Development Strategy of Georgia 2018-2021,** which has been recently approved**,** considers a great area of hay meadows and pastures in Kakheti, Racha-Lechkhumi, Shida Kartli and Mtskheta-Mtianeti a specific potential, which requires development. However, it fails to define specific objectives and measures for pastures.

Notwithstanding that sectorial and regional development strategies approved by the Government of Georgia define normalization and sustainable management of pastures as one of the priority issues, **the Document on Basic Data and Approaches of the country 2019-2022** (which is a mid-term developing document and a basis of the state budgeting) has only planned facilitation of rational utilization of pastures in the protected areas.

Clipping 9: Existing and possible pathways for pasture management (ELD 2018)

The ELD policy paper provides an overview and outlook in existing and possible pathways for pasture management in Georgia.

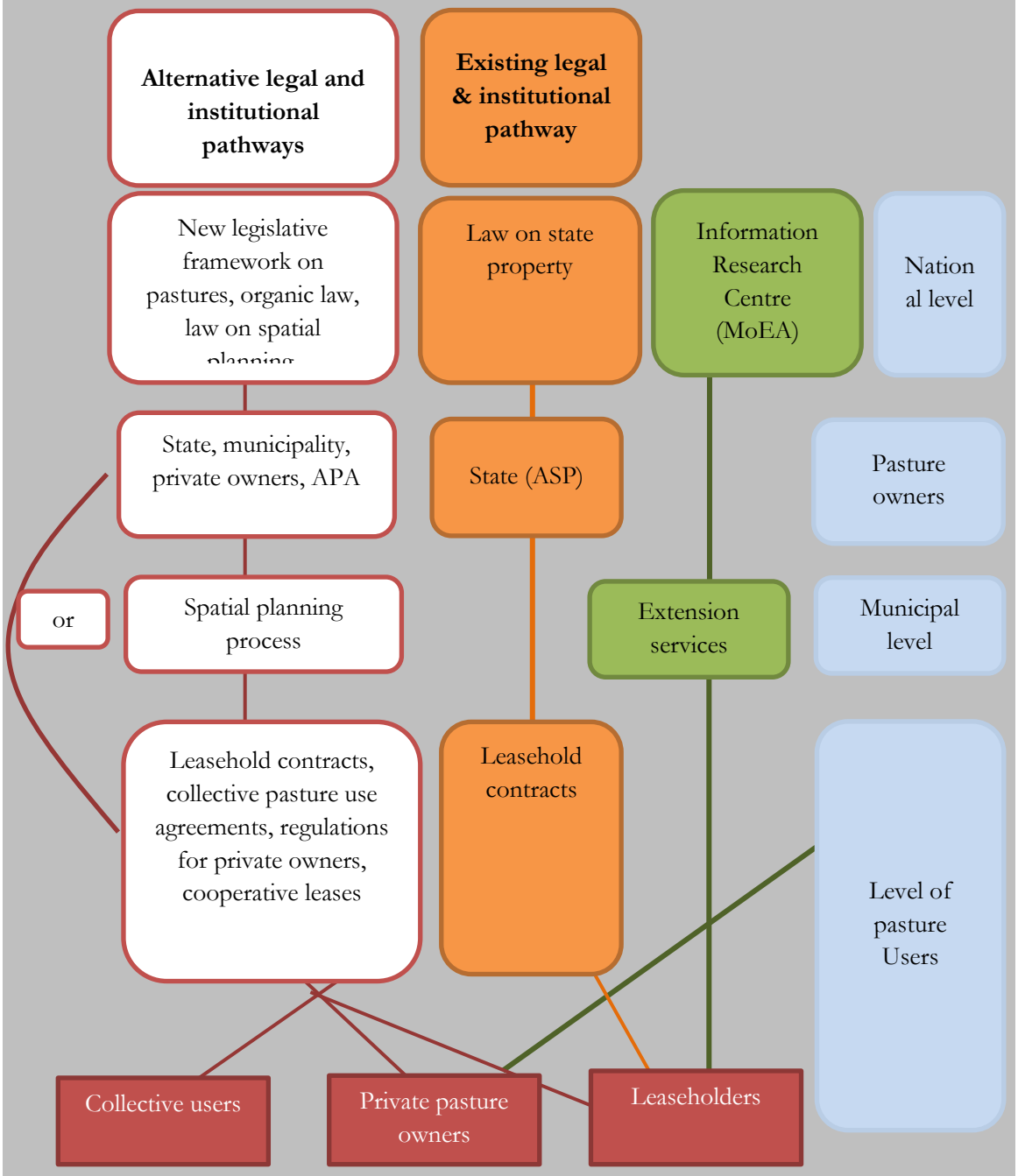


Figure 7: Existing and possible pathways for pasture management (ELD 2018). Dotted lines represent absent relationships.

Overall, the study summarizes and proposes that "Georgia should design an institutional and legal framework which considers pastures as part of wider grazing systems, often spanning multiple ecosystems and territories" (ELD 2018), and hence a system flexible enough to accommodate different claims on resources i.e. different needs of livestock and pastoralists with different social and economic status, having different priorities and reasons to engage in livestock production. "Many users have strong traditional claims on

pasture which they are unable to realize legally. These issues could perhaps be partially addressed through greater decentralization of allocation or management. Technical solutions such as rotation, destocking and holistic planned grazing have potential but would benefit from field demonstration before they can be recommended." (ELD 2018)

5.3 ADDRESSING GENDER IN PASTURE MANAGEMENT

"At a time when gender equality and women's empowerment are gaining momentum worldwide, there is great hope and potential for gender transformative change. Such change can help to ensure sustainable environments, increased well-being of mountain communities, and equal sharing of development and decision-making benefits among women and men, as well as girls and boys. The efforts and strategies that we put into place today can have important impacts in the future, based on critical lessons learned from past efforts. One important lesson from several decades of gender research is that although gender relations play a critical role in the management of natural resources, women tend to be systematically disadvantaged in terms of access to resources, decision-making, and, ultimately, power relations. Women are not passive victims, however. Women have critically valuable knowledge and agency—as researchers, farmers, natural resource managers, water users, pastoralists, entrepreneurs, scientists, engineers, artisans, preservers of culture, and important players in many other roles that are key to ensuring sustainable environments and the well-being of mountain communities. Gender analysis is a valuable tool for understanding these roles and processes, but action, resources, and policies that specifically support and improve women's lives are also necessary—just as it is necessary to recognize the important role that men play in championing gender empowerment." (Molden et al. 2014)

According to FAO (2018) agriculture including the livestock sector are underperforming in many countries, in part because men and women do not have equal access to the resources and opportunities, they need to be productive. The challenges women in pastoralism face are enormous and mainly linked to the complex gender relationships (Flintan 2008). Inequalities affect their roles and responsibilities, and play a major part in traditional customs, property rights, decision-making, and the access to resources, as well as the use and control of income, assets, resources and services. Such inequalities restrict women's potential but also limit the economic opportunities of the entire family. Increasing women's access to land, livestock, education, financial services, extension, technology and rural employment, according to FAO, would boost their productivity and generate gains in agricultural output, food security, economic growth and social welfare.

After the Rose Revolution, Georgia pursued a number of reforms including the establishment of gender equality in which men and women have equal rights and opportunities. Already in 1994 Georgia joined the Convention on the Elimination of all Forms of Discrimination Against Women (CEDAW).[32] Gender equality is reflected in the Georgian Constitution and numerous laws, policies, strategies and action plans[33] (UN Gender Assessment 2016: 10) Ever since women's and civil society groups in Georgia are criticizing the low level of attention towards this

[32] In its Concluding Observations on the joint fourth and fifth periodical report, the CEDAW Committee recommended that Georgia should "(…) ensure that rural women have adequate access to social, health-care and other basic services and economic opportunities, in addition to equal opportunities to participate in political and public life, in particular in decisions relating to the agricultural sector. The Committee also recommends that the State party ensure the availability of nurseries, in addition to shelters and other services for victims of domestic violence, in rural areas. It further recommends that the State party provide sex-disaggregated data on land ownership in its next periodic report." UN 2016: 32. 54; CEDAW/C/GEO/CO/4-5, 2014, para 33.

[33] These include, but are not limited to, the Human Rights Strategy, the Gender Equality Law and its action plans, the Anti-Domestic Violence Law and its action plans, the Anti- Trafficking Law with relevant action plans, the Action Plan on Women, Peace and Security, and finally the Labor Code.

issue and the insufficient commitment by the state to accomplishing its international or domestic obligations (Chekheidze 2011). As a result of the lack of an executive branch agency devoted exclusively to this goal, the promotion of gender equality in Georgia is particularly hampered. According to UNDP, Especially the situation of rural women in agriculture and rural development requires significant improvement in the policy sphere.[34]

The Strategy for Agricultural Development in Georgia 2015-2020 seems not to have undergone gender mainstreaming prior to its issuance. According to the UN "Gender Equality in Georgia: Barriers and Recommendations" report): "The strategy mentions gender only within two out of the seven directions, and only in one sub-heading within each of them. Strategic Direction 3.1, Enhanced competitiveness of rural entrepreneurs, refers to Measure 3.1.6 (Supporting the development of cooperation in agriculture) to the importance of cooperatives for involving women and other vulnerable groups in economic activities. Within the Strategic Direction 3.2., Institutional development, the collection of data disaggregated by gender is referenced in Measure 3.2.2 (Supporting an efficient market information collection, processing and dissemination among the different stakeholders actively engaged in the agricultural sector).The Conclusion of the Strategy also refers to the collection of gender-disaggregated data during the period of its implementation." (UNDP 2018).

On the other hand, numerous laws and documents provide for the potential to address and foster gender equality in Georgia and give concrete advise and recommendations where and how to address gender inequalities:

- In 2014, the Government approved an Action Plan on Gender Equality Policy (2014-2016), one component of which aimed to secure "gender equality in the economic field".
- The National Action Plan on the Protection of Human Rights (2016-2017) contains a section on "Gender equality and women's empowerment". Mission 13.1.4 addresses the "Promotion of women's economic empowerment," to be achieved through business education and capacity-building support, including in agriculture and agro-business, increasing women's participation in agricultural cooperatives and ensuring their involvement in rural development." (UNDP 2018:23)
- In 2016 the Government of Georgia began the nationalization of the Sustainable Development Goals (SDGs). According to the National Statistics Office of Georgia (GeoStat) the Government identified the priority goals, targets and indicators through the adaptation of the 2030 Agenda for Sustainable Development. By implementing the SDG national agenda, by 2030 the situation regarding gender equality is supposed to be significantly improved in the country. Specifically, Goal 5 with its relevant objectives and indicators focuses on achieving gender equality and empowering all women and girls. Other objectives and indicators related to gender equality are also defined in other SDGs, the connection between national gender statistics and the SDGs are reflected in this publication. Therein, the agrarian sector is stressed, due to the importance of the sector for the economy of Georgia employing 50.89% of the active population, of which 54.13% of are women.

[34] According to UNDP: „Inequalities in women's involvement in agricultural production can be attributed, in part, limited access to basic services and social infrastructure and barriers to credit. While agricultural policies specifically address women's needs in some areas, meaningful gender mainstreaming has not been conducted for national, regional and village level policies in this field. There is thus a significant need for gender mainstreaming in agricultural and rural development policies. For example, gender mainstreaming should be performed on the Strategy for Agricultural Development in Georgia 2015-2020, including a gender-responsive budgeting analysis to determine any gaps in its responsiveness to women's needs and to foster gender equality in the agricultural sector. The same is true for the Rural Development Strategy and Action Plan and the Strategy of Market Formation and Action Plan. Furthermore, gender equality concerns and the gendered dimensions of specific problems are largely absent from regional development strategies, requiring increased supervision by the Ministry of Regional Development and Infrastructure, and amended policies." (UNDP 2018:7)

In 2010, more than 100 pastoralist women from 31 countries gathered in the village of Mera (Gujarat, India), to demand more opportunities, including better access to productive resources, markets, technologies, knowledge and services, while still retaining their culture and traditional lifestyle. This was documented in the Mera Declaration. Even if there was no woman from Georgia on the list of participants, the declaration can be seen as an important basis and guideline for a gender sensitive planning of pasture management and the development of future legislative drafts in the pastoral sector.

Clipping 10: Gender in pastoralism - The Mera Declaration of the Gathering of Women Pastoralists[35]

- 2. ENSURE the equal rights of pastoralist women and recognize their key role in society.
- 5. PROTECT the rights of pastoralists and provide security in nomadic areas including the enforcement of laws that guarantee the safety of women.
- 9. ADAPT existing legislation to take into account the specificities of pastoralist ways of life and differentiate nomadic and transhumant pastoralism from intensive livestock production.
- 10. PROMOTE regional policies and treaties that take into account trans- border pastoralism and respect traditional grazing territories and migratory patterns. These are to be negotiated in consultation with pastoralist women.
- 11. DEVELOP specific policies that promote the sustainability and welfare of pastoral ways of life and the ecosystems we rely on for survival. The policy-making process must include meaningful participation, and consultation, with pastoralist women.
- The Mera Declaration of the Gathering of Women Pastoralists 2010
- 20. CREATE and support programs that promote the economic development and diversify economic opportunities for pastoralist women, including micro-credit financing. These programs must be developed in consultation with pastoralist women.
- 21. SUPPORT pastoral women through capacity building, including direct access to markets and training to improve the quality and marketability of their work and managerial skills.
- 22. SUPPORT training programs focused on leadership and communication to enable pastoralist women to effectively participate in negotiations in all issues affecting their ways of life

5.4 ADRESSING YOUTH IN PASTURE MANAGEMENT

Georgia is experiencing some major demographic trends in rural areas that affect the future of pastoralism, notably decreasing population, aging, and urbanization. The share of the young people aged 15-29 to the whole population of Georgia is 19% showing a decreasing trend for the past years (GeoStat). The majority of young people (53.1% approximately) live in urban areas. And as an aggravating factor around 30% of the youth aged 15-29 and are not formally employed, or not participating in educational or training programmes (GEoStat; Bridge 2017: 7).

[35]Women Pastoralists (2012).

According to Bridge (2017) the agricultural activities or young people mainly associate with the most traditional fields of agriculture, such as winemaking, livestock breeding, citrus etc. and less likely in developing fields (e.g. berry crops, dried fruit making, hazelnuts etc.). In the same time agricultural activities evoke more negative associations amongst young people who migrated to towns and cities, than amongst the rural youth. "For urban residents, agriculture has no perspective and is associated with hard labor, while for the young people who live in rural areas, besides negative factors, agriculture is connected with income, enhancing activities, the realization of product and producing the organic product" (Bridge 2017: 7). According to the report the involvement of young people in agricultural activities often is caused by obligations towards their families. Often these young people have a family background in wich traditionally and successfully different fields of agriculture are followed and for whom the income received from agricultural activities is one of the main sources of income. The study revealed that the feeling of "no perspective in agriculture" forces young people to look for alternative ways to realize their abilities. Other reasons for outmigration and urbanization are pursuing higher education, the absence of necessary infrastructure in villages (including leisure activities), social support networks and etc. Successful young individuals in agriculture are those who are supported by their parents, are provided with fortune by heritage, or have basic knowledge in agriculture and sustain qualification by communication and networking with other farmers and extension services, seek for innovations, manage to get quality certificates, produce for the export market, etc.

At government level, several international agreement and memorandums are particularly targeting young people in the Georgia which should be used as guiding principles for developments in the field of pasture management. Of particular importance are the strategic cooperation document with the United Nations, based on UN-SDG´s. and the association agreement with the European Union (2014) which contains two main articles regarding young people – articles ## 360 and 368, in which the support youth policy implementation, experience sharing, youth mobility, informal education, intercultural dialogues, and other youth related issues in Georgia, are agreed upon. For the latter a new action plan is worked out annually together with EU regarding youth policy (Bridge 2017: 7).

An assessment of attitudes and needs of youth in pastoralism including the questions: How to address young people? What impact will addressing young peop particularly have on future developments in pastoralism? What would young people motivate to stay in rural areas and engage in animal husbandry? etc.

5.5 INSTITUTIONAL ARRANGEMENTS OF PASTURES MANAGEMENT

The Ministry of Environmental Protection and Agriculture of Georgia

In December 2017, in a consequence of changes introduced to the organization of the Government of Georgia, the ministries of Environmental and Natural Resources Protection and Agriculture were merged.

The newly created Ministry of Environmental Protection and Agriculture controls the fields of environmental protection, development of agriculture and villages and facilitation of the development. The basic objectives of the Ministry of Environmental Protection and Agriculture are introduction of agrarian reforms in the country by taking into account the traditions of the country and international practice, control of animal husbandry and facilitation of development

thereof, and development and implementation of land resources management and state protective policy.

The objectives of **Department of Agriculture, Food and Village Development** (a structural subdivision of central apparatus of the Ministry) are definition of prioritized direction of development of agrarian sector, development of programs to develop animal husbandry, establishment of legal regulatory base for agriculture and veterinary fields, formation of methodical instructions and recommendations.

Coordination of planning and implementing measures to mitigate desertification and land degradation process, as well as, coordination and regulation of managing topsoil are responsibilities of **Department of Environmental Protection and Climate Changes**, while the duties of **Department of Hydro melioration and Land Management** cover formation of agricultural land use policy and monitoring implementation thereof, planning and coordinating implementation of measures to improve agricultural land use.

Regional Administrations represent the Ministry at local level and **Information-Consultation Offices** in municipalities.

The Regional Administrations[36] has authority to facilitate development of agricultural and environmental protection strategies in regions, to facilitate development of agricultural cooperatives, to identify and analyze problems in the field of agriculture, to define priority directions and to form recommendations for the Ministry. Besides, the Regional Administrations gather information about the status of cultivation of agricultural lands.

In 2014, **Information-Consultation Offices**[37] of the Ministry of Environmental Protection were established in the municipalities of Georgia to boost knowledge of farmers and to extend effective agricultural services to them. The Offices are mainly authorized to gather information about agricultural lands, to inform farmers and to provide consultations about different subjects, including, rational utilization of pastures.

The functions of **Scientific-Research Center of Agriculture**[38] which was established at the Ministry in 2014 cover, inter alia, exploration and implementation of new technologies, exploration and implementation of enhancement of fertilization and improvement of soil structure, study of endemic species, compilation of genetic fund of local species of animals, study and dissemination of modern technological methods of livestock treatment.

In 2013, **Agricultural Cooperatives Development Agency** was created in the Ministry which is authorized to assign, suspend and terminate a status of agricultural cooperative, to create a database about the activities of the cooperatives, to facilitate knowledge and experience share among agricultural cooperatives, to monitor the cooperatives. Today, the Agency is responsible for implementing state program about rational utilization of high mountain hay meadows and pastures owned by the state, in particular, it is responsible to undertake state procurement, to register participants, to submit necessary information for hay meadow/pastures lease agreement to National Agency of State Property.

Agency of Protected Areas (LEPL under the Ministry of Environmental Protection and Agriculture) is authorized to manage pastures in the protected areas, in particular, in conventional zones of the National Park and individual zones of the Managed Reserve. According to the Law on System of Protected Areas, the grazing is allowed in protected landscapes and territories of different designations; however, the management of protected areas

[36] The Statute is approved by the Order #2-333 dated May 11, 2018, of the Minister of Environmental Protection and Agriculture of Georgia.
[37] The Statute is approved by the Order #2-332, May 11, 2018, of the Minister of Environmental Protection and Agriculture of Georgia.
[38] The Statute is approved by the Order #2-51 dated February 25, 2014, of the Minister of Agriculture of Georgia.

of this category does not fall under the authority of the Agency of Protected Areas. The Agency of Protected Areas is authorized to lease hay meadows and pastures to local population for no more than 10 years, based on the application of local Self-Government body. Under the state program of rational utilization of the state-owned hay meadows and pastures in high mountain regions, if a hay meadow or a pasture to be leased to falls within the protected area, the lease agreement is signed in case of consent of the Agency of Protected Areas.

Today, local population utilizes pastures found in the conventional zones of several National Parks, including that of Vashlovani, Borjom-Kharagauli, Kolkheti, Tusheti. They are regulated by management plan or a temporary regulatory rule of the said protected areas. The administrations of the specific Protected Areas control and monitor utilization of pastures by local population. In several protected areas, study of pastures utilization has been undertaken; based on this study pastures management plans have been formed, but they have not been formally approved.

There are two protected landscapes in Georgia that of Tusheti and Kintrishi. **Administration of Tusheti Protected Landscape, a Non-Entrepreneurial (Non-Commercial) Legal Entity, manages Tusheti Protected Landscape.** The Administration was founded by Akhmeta Municipality in 2011. The meadows used for pastures occupy approximately 85% of the Tusheti Protected Landscape.

Managing, handling and transferring the state property into private ownership, including leasing of pastures and privatizing immovable property leased to before January 1, 2007, by direct procurement fall under the powers of the **Agency of State Property** (Legal Entity of Public Law of the Ministry of Economics and Sustainable Development).

The Agency of State Property has 7 service centers across the regions of Georgia and in Tbilisi. They manage, handle and transfer the state property into private ownership in the respective administrative-territorial unit. The service centers monitor the observance of obligations assumed by a person receiving ownership rights, account and register the state property.

As stated in conditions of pastures lease agreement, a lessee is obliged to submit a report on status of pastures prepared by soils and ground laboratory and forensics bureau to the Agency of State Property. Assessment of pastures conditions costs approximately 50 USD and it should be submitted to the Ministry of Environmental Protection and Agriculture for no objection.

Local Self-Government Bodies have powers to manage and handle the property owned by municipality, including, land resources owned by the municipality. They are authorized to do spatial-territorial planning of municipality, to develop and to approve plan of spatial planning of municipality, master plans and development plans/detailed development plans. Thus, local Self-Government bodies lease pastures registered as their own property.

National Agency of Public Registry[39] records information about rights to immovable property defined by Georgian law on Public Registry, obligations arisen as a result of property rights to immovable property, amendments and/or termination thereto, changes in identification information of subjects and objects, abandonment of property rights to immovable property, changes in purposes of land and in category of agricultural land. Besides, it records data about immovable property without registered right. The Agency executes its powers via territorial offices (8 regional offices and 54 branches in municipalities).

The objectives of the **Ministry of Regional Development and Infrastructure** include development of regional development policy and strategy, preparation of legal basis for decentralizing government system, as well as, incentivization of entrepreneurial and investment activities across the regions. Under the auspices of the Ministry, seven-year development strategies of all regions for 2014-2021 have been prepared and approved. The main objective of

[39] The Statute is approved by the Order #134 dated May 3, 2016, of the Minister of Justice of Georgia.

the Ministry is to implement infrastructure projects aimed at long-term benefits in the regions of the country. Under the state program of rational utilization of the state-owned hay meadows and pastures in high mountain regions, the Ministry of Regional Development and Infrastructure is charged with providing access road to hay meadows and pastures under the program together with municipalities and with providing water to milk factories.

6. EXAMPLES OF BEST PRACTICE OF PASTURES SUSTAINABLE MANAGEMENT

The sustainable management of the pastures implies the adoption of measures aimed at preserving the optimal status of vegetation and soil fertility. A properly managed pasture and a pasture in a good condition ensures the provision of sufficient nutrition and energy to livestock during the whole grazing season. Effective pastoral grazing management can be used as tool not only to improve grassland/rangeland biodiversity but also to prevent land degradation and desertification through maintaining rangeland ecosystem integrity (Niamir-Fuller 1999). Under proper management conditions, erosion is reduced, the circulation of nutrients and water and overall landscape features are improved.

The proper management of pastures provides the sector of animal husbandry with cost-efficient and readily available biological resources, which, in turn, facilitates the development of the agricultural sector and the satisfaction of socio-economic interests of the population.

Pastures management, however, is not only limited to the regulation of livestock numbers. Usually, pastures are damaged not by excessive grazing of livestock, but rather by the absence of a management system. A proper management implies the preservation of an optimal amount of vegetation on the pastures, the avoidance of overgrazing, and a grazing regime and a calendar. In consequence of these measures, it is possible to significantly increase (in some cases twice and more) the population of livestock in pastures so that vegetation is not deteriorated.

In planning the management measures, it is essential to consider the following:

- Period of pastures utilization;
- Vegetation and restoration periods;
- Climatic features.

In case of a proper management of pasture, the following advantages will be obtained:

- Increase in food yield (increased share of legumes);
- Increase in meat, milk and cheese yields;
- Increase in organic matter of the soil;
- Decrease in loads of pests and diseases.

Considering the abovementioned, the most important objective of pastures management is to provide livestock with sufficient fodder throughout the whole grazing period. To this end, it is essential:

- To sustain the growth and regeneration capacities of plants damaged by grazing;
- To sustain soils rich in nutrients (organic and inorganic) and water;
- To preserve biodiversity and not to let the growth of undesirable species (growth of weeds);
- That topsoil is not washed out and lost.

It should be noted that the management of artificial and natural pastures are different in kind:

In case of artificial pastures, the objective is to gain maximum productivity by minimal expenses; while in the cases of natural pastures, the preservation of their ecological balance and biodiversity prevail.

In case of artificial pastures, it is possible to implement different measures of pastures improvement (for example, planting nutritious species or crops), while in case of natural pastures, such activities are limited (especially in protected areas).

It is important to know the ecological features of vegetation growth and development to develop effective management and grazing regimes of pastures. Every plant is damaged due to grazing, but the

plants have regeneration capacity; however, their recovery differs and is in paces and periods of growth and development. The regeneration pace of vegetation is significantly related to geographic (slope, exposition, landscape, elevation above the sea level, etc.) or climatic peculiarities of pastures which have to be taken into account while planning the measures.

In addition, a great attention should be paid to the type of vegetation; for instance, in the case of annuals, a crucial role has to be assigned to seed maturity and ingress into the soil, while in the case of perennial vegetation, it is important to continue grazing in a such a way that no harm comes to growth areas of perennials. In case of perennial vegetation, it is extremely important to avoid maturation of plants It is known that perennial plants lack nutrients in leaves and stems as they ripen., as seeds consume the energy generated by the plant, and leaves gradually wither[40]. Therefore, it is important to encourage management practices that prevent the ripening of perennial herbaceous plants by frequent grazing and mowing when pastures are rotated.

During grazing, as it has been mentioned, leaves and other parts of the plant get harmed. Their restoration requires additional time and resources (water, organic and inorganic matters, sun energy). The regeneration process relies on organic carbohydrates accumulated in the plant. In addition, it is essential to have at least some leaves for the synthesis of organic matters in photosynthesis.

In times of constant grazing or insufficient resources (for instance, water scarcity, low temperature, lack of sun energy) the plants get damaged and cannot manage to regenerate their lost leaves or other parts during their vegetation period. In addition, plants have so-called growth points, which, normally, are below the stem. Unlike the leaves, if growth points get damaged, they require a lot of time and energy. It should be noted that the higher the stress, the more time and resources are necessary to regenerate the plants.

It is important to take into account the fact that livestock grazing is selective, i.e. animals prefer certain types of plants. Under constant stress, such herbaceous plants cannot manage to regenerate, bloom, secrete seed, mature and multiply. As a result, the seed banks of the soil are reduced, which leads to a significant decrease in pasture nutrients. There against, species which are grazed less, reproduce quickly. All this cause changes in the species composition of pastures, the reproduction of inedible species (weeds) and the reduction of edible biomass on pastures.

Considering this, pastures management should be planned and conducted so that plants are allowed to regenerate, grow and reproduce. First, the vegetation period and the amount of precipitation should be taken into account. Simultaneously, in order to restore vegetation, it is necessary that certain plots of pastures rest.

Rotational grazing

One of the efficient ways of pastures management is rotational grazing which is considerably different from so-called regulated grazing practice which are permanent and more or less approbated and common in Georgia.

[40] Life cycle of herbaceous plant can be divided into three stages: initial vegetation, exponential growth and reproductive stage.

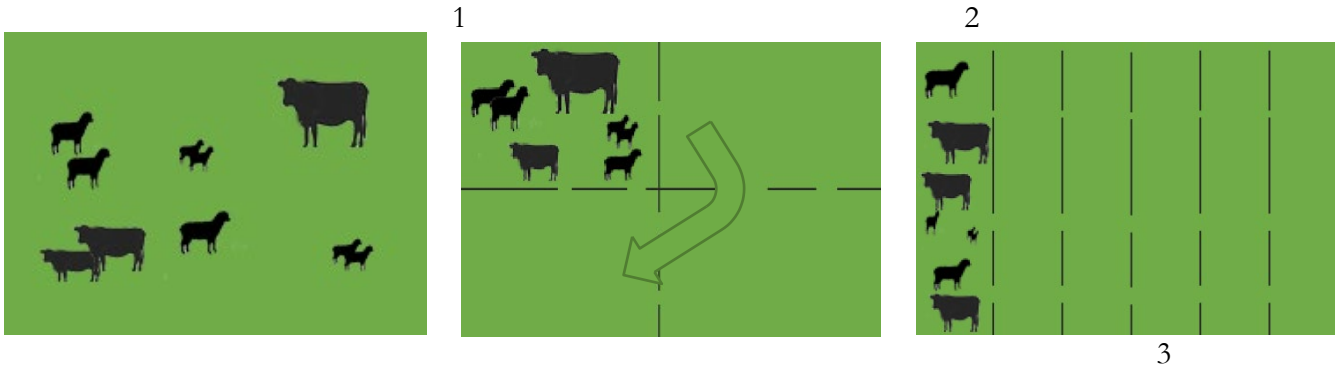


Figure 8. Grazing schemes: 1) permanent, 2) regulated; 3) pastures rotation

Permanent grazing practice is common in Georgia. It is an unsystematic form of grazing in which the whole pasture area is used without any regulation – i.e. livestock uses the whole area of pasture and moves freely.

A regulated grazing system refers to a limited amount of grazing time and area. For Georgia, such practices mean dividing the pastures into several plots and using them alternately. Therefore, normally the pasture is divided into parts (as usual, alongside natural landmarks, i.e. rivers, ranges, valleys, forest borders).

The shepherds let the livestock graze only on one part and then drive it to another part. The selection of plots is at the discretion of the shepherd. Regulated grazing system ensures a resting period between grazing and aims to preclude long and continuous grazing periods.

It is true that this system more or less protects pastures against overgrazing, but, unfortunately, it cannot fully fulfill its function. Under regulated grazing, livestock is (still) able to graze desirable species and leave fewer desirable plants intact, which then reproduce at a higher rate (Undersander et al. 2002).

Besides, it is common for shepherds to use the same plots during a particular season, e.g. a part is left for dairy cattle. In the vegetation season, such a form of pasture management still has negative impacts on vegetation content and status, since the vegetative period (stages of vegetation development), grazing levels and soil condition are not considered. Furthermore, in the case of regulated grazing, the utilization indicator of the natural resources does not exceed 30-40%. Hence, the economic yield is significantly reduced.

Rotational grazing, like regulated grazing, is concerned with utilization of a certain part of the pasture. In this case, land should be divided into small plots separated by physical barriers, for example, by mesh or electric fences.

Figure 9. Rotational grazing

Under such circumstances, the livestock is concentrated on a small part of the plot for a short amount of time (one day or two, or one week). This does not allow the livestock to graze desirable species.

Instead of a mechanical shift in grazing, the livestock is grazed taking into account various parameters and by specific frequency in order to allow a constant growth of plant on the pastures.

In planning rotational grazing, it is first of all essential to create enabling conditions for the restoration of vegetation. The main objective is to maintain the exponential growth of plants resulting in a large amount of biomass in parallel to grazing.

This approach allows more food to be produced to provide animals with a healthy and cost-effective diet.

Rotational grazing enables to increase the indicators of natural resources utilization to 60% so that no damage occurs to the pasture ecosystem. Moreover, in the case of rotational grazing, it is possible to increase density of livestock on the pasture which is important from economic point of view.

One of the advantages of rotational grazing is that the plants are physiologically in a better condition. For example, a study carried out in the USA showed that in the rotational pasture the wild grass roots grew by more than one meter, while in case of ordinary pasturing, the length of roots reached only 20-25 cm.

There are some fundamental principles that define the basic rules of rotational grazing, taking into account local peculiarities.

Clipping 11: Fundamental principles defining the basic rules of rotational grazing:

- Normally, grazing begins when the height of grass reaches 15-20 cm; grazing should cease if the height of grass drops to 5-10 cm;
- It is extremely important to take the vegetation period of the vegetation on different parts of the pastures into account, because different plants have different vegetation periods.
- In case of perennials, it is necessary to employ management practices of pastures that prevent plants from reaching maturity/ripening. It can be avoided by alternating grazing and mowing.
- It is important to change the sequence of using pasturelands plots from year to year. This approach excludes the re-utilization of the same plots for the same vegetation period.
- It is necessary to plan the plots so that the whole space of the pasture is utilized during rotational grazing. This facilitates the growth of biomass and equal load on species, as well as, equal fertilization of the pastures through products of metabolic processes.
- The grazing of heavily degraded pastures should be prohibited/excluded for one or more years.; only after their restoration a gradual loading can be pressed.

The ELD study (2018) proposes annual pasture rotation, as one of three scenarios to for pasture management in order to achieve land degradation neutrality. Based on small migratory households in Kakheti as a sample the study investigates and calculates whether the gains from

setting aside pasture for one year will offset the reduced area of pasture available. [41] A further scenario for pasture management in Kakheti/Georgia proposed in the ELD Policy Brief (2018)[42] apart from destocking, is **Holistic Planned Grazing**, which can be regarded as a special case of rotational grazing (see Clipping 11).

Clipping 12: Holistic Planned Grazing

Holistic Planned Grazing (HPG) is based on the assumption that overgrazing is the result of leaving animals to graze for too long and returning too soon to the same areas, rather than actual number of animals per unit area (Savory, 1983).

The best way to avoid overgrazing is therefore to plan recovery periods and let these determine grazing periods. This method differs from other rotational grazing systems by the enforcement of short-duration high intensity grazing on paddocks, which may be demarcated by physical or visual barriers such as natural features. On winter pastures paddocks are envisaged during the growing periods of autumn and spring only, as during the non-growing season there is no vegetation recovery.

Destocking

Most range scientists agree that the primary factor affecting pasture condition is stocking rate. This strategy – e.g. proposed in the ELD-policy brief – concerns the voluntary reduction of animal numbers to sustainable levels. The key steps involved in valuation of this strategy are:

- Assessment of total forage supply, taking into account proper use factors.
- Assessment of forage demand, which is a function of the number and species of animals and the grazing period.
- Matching forage supply to demand by reducing animal numbers.
- Valuing the impact of changing stocking densities on pastoral household economies

	Resident	Migrator small herd	Migrator medium herd	Migrator large herd
Before destocking (baseline)				
Sheep units	230	390	1071	2542
Stocking rate	2.5	2.34	2.12	2.5

[41] Parameters for this scenario come from real exclosure experiments on winter pastures in Dedoplitskaro municipality (Lachashvili, 2015, 2016).

[42] The ELD study examines the legal framework covering pasture access and explores the economic impacts of grazing management changes on individual pastoralists: A) A valuation study was undertaken, analyzing the costs and benefits of three different types of grazing management: destocking, annual rotational grazing and Holistic Planned Grazing (HPG), focusing on winter pastures. The valuations are based on field data from a household survey conducted in five districts of Kakheti: Dedoplistskaro, Gurjaani, Telavi, Akhmeta and Sagarejo. The survey data were used to group households into profiles by mobility and livestock holding size and the valuation exercises applied to these profiles separately (Table 1). Data on vegetation were collected from the literature, particularly on Dedoplitskaro region, and using biomass estimations from the PROBA-V satellite Leaf Area Index (LAI) product available from 2014 to the present and calibrated to biomass using field data available for Tusheti from GIZ; B) The survey data were also used to examine household budgets in order to understand the economic characteristics of the household profiles and to set the scene for the valuation; C) A review of property rights legislation relevant to pastures was conducted and possible pathways for improved management examined.

Net household income (GEL)	1,459	2,825	17,925	7,053
Margin	5%	6%	16%	28%
After destocking				
Sheep units	120	200	606	1220
Net household income (GEL)[43]	-557	-4920	-4,290	10,140
Difference against baseline	-2,017	-7,745	-22,214	-59,913
NPV over five years (GEL)[44]	9,579	-4,749	-22,302	-94,878

Figure: Destocking calculations for migratory households in Kakheti (proposed by ELD 2018)

Practices of maintaining biodiversity on natural hay meadows and pastures

As already mentioned, a considerable part of Georgia's hay meadows and pastures is made up of natural grassland. The management of such pastures involves the need to preserve the diversity of ecosystems and species. Taking into account the specific pasture conditions, but also natural conditions and conservation objectives, it is important to plan measures facilitating the increase of pasture yield and the improvement of the overall situation. Measures for the use and management of pastures, including the improvement of pastures, should be planned and implemented with a view to the protection interest and should ensure the need for long-term conservation of biological diversity.

In contrast to comprehensive improvement measures for pastures, the management system for natural pastures does not require significant financial expenditure and its use is ecologically justified.

The following principles and guidelines for managing natural pastures should be considered:

Clipping 13: Principles and guidelines for managing natural pastures:

Preservation of ecological integrity of pastures: all decisions related to pastures management and utilization are made in view of whether the intended measure will cause a disruption of the ecological integrity of pastures.

Legal regulations: a corresponding state body should be responsible for leasing and managing pastures. The management, in the first place, implies the preservation of the ecological integrity of pastures by defining permissible loads (stocking rates) on pastures and grazing regimes (calendar, rotation principle, etc.). The permissible stocking rates per hectare

[43] Net annual cost or benefit per household = avoided cost of additional forage – forgone profit per head of livestock.

[44] Net Present Value = net annual loss per household over five years compared to the baseline, plus one-off gain from livestock in year 1 discounted by 4% over five years.

and the respective grazing regime are defined based on results of a preliminary assessment of pastures.

These, as well as incentives or sanctions for non-compliance with terms and conditions of leasing could be set out in the leasing contract.

Territorial limitation of grazing: only territory designated for grazing can be used as pastures;

Participatory management of pastures: decisions related to pastures management will be made based on participatory management by intensive consultation with main concerned parties;

The formation of pasture user groups (especially for village pastures, but potentially also for summer- and winter pastures)

this ensures the sense of ownership, local control of rule compliance and the inclusion of local knowledge, practices and institutions. One management mechanism which is already being trialed by the government, is the allocation of pastures to cooperatives.

Grazing monitoring: relevant state institutions constantly monitor pastures (i.e. quality, stocking rate etc.). Institutions also observe the compliance with rules and regulations set out by the lease contract.

Lessons learnt from pasture management in Protected Areas

In terms of managing natural hay meadows and pastures it is important to consider the experiences accumulated by the Agency of Protected Areas. Effective management of pastures and their sustainable management are an acute problem of many protected areas of Georgia. The Agency of Protected Areas has made first steps in the field of sustainable management of pastures; however, considering the fact that pasture management fell under the purview of the Agency of Protected Areas some time ago (2013) (before that pastures were managed by local authorities), the development of management plans was accompanied by certain limitations, both at institutional and project level.

Today, by the support of international organizations and local partners, an initial assessment of pastures in Vashlovani and Lagodekhi protected areas has been conducted and management plans have been prepared. The same process is being undertaken in the Borjom-Kharagauli National Park and Tutsheti Protected Area. Recently, the Agency of Protected Areas has leased out pastures in Javakheti Protected Areas.

In view of specifics and natural conditions of the territories, improvement measures for pasture yields and their overall condition are limited. It is preferred to implement superficial improvement measures, which, unlike core measures, do not require expensive amelioration activities, seeding, etc. The improvement of floristic content is permitted under conditions of preserving natural wild grass.

Pastures management is an integral part of spatial management plans. The general objectives of pastures management are the following:

- Preservation of natural resources and biodiversity by ecological management and traditional pasture practice;
- Improvement of ecological condition of protected territories by sustainable management of pastures;
- Introduction and facilitation of best practice for the management of pastures;
- Provision of participatory management of natural resources of protected areas.

Preparation of pastures management plan

The first stage of the preparation of a plan includes the collection of basic information and the assessment of the pastures condition. Besides, it is necessary to conduct an in-depth analysis of legal and institutional aspects of pastures utilization.

Preparation of status plan and estimation of pastures borders

The first objective is to prepare a status plan of pastures and estimation of individual pastures borders. In this regard, an important aid is provided by methods of remote sounding (analysis of satellite image, orthophoto and other data). In addition, knowledge of shared farmers about borders of own pastures, features and pasture regime should be taken into consideration. Based on analysis of information gathered from the farmers and study of agreements (this is extremely important), it is necessary to create a picture of spatial distribution of pastures, which will preclude social conflicts from arising.

Assessment of pastures condition

The second important step of plan preparation is an assessment of conditions of pastures. In case protected areas of Georgia, to assess pastures a methodology described by Etzold and Neudert (2013) is used which considers evaluation of Status of Pastures Index (SPI). The assessment of this parameter enables to determine load of livestock on pasture (expressed by sheep unit per ha (SU/ha)).

The assessment of pastures condition can employ any different methodology, which enables a constant monitoring of pastures by using limited budget and little administrative resources.

Preparation of management recommendations

Following the assessment of pastures, different measures of pastures improvement and adaptation thereof to protected territories are considered. It is important to discuss planned measures with concerned parties; to scrutinize them in light of feasibility based on criteria as financial viability, socio-economic impact and feasibility, and real possibilities of management of main actors.

Measures for pastureland rehabilitation shall include the maintenance of natural grass composition and, in parallel, improvement of pastureland productivity.

These measures might include:

- Establishment of rules of utilization of pastures (for instance, rotational or regulated grazing);
- Legal issues of pastures utilization and obligations of parties involved in grazing;
- Determination of pastures' borders;
- Determination of loading rates;
- Establishment of prohibitive rules of temporary or long-term grazing;
- Determination of grazing season (i.e. starting and finishing points of the grazing period);
- Determination of height of grazing;
- Pasture fertilization measures;
- Measures against weeds;
- Measures against fire;
- Monitoring issues (i.e. monitoring of pasture quality but also compliance with rules and regulations)

- Revision of management plans.

Implementation and approval of management plan

After recommendations about improving pastures have been discussed, the relevant institution approves the pastures management plan.

In approving, the most important factor to be considered is that the management plan should be based on the following preconditions: (i) pastureland use right is essential to meet social needs of local population; use of pasturelands by local population determines visual of landscape; (ii) All stakeholders involved in the utilization of pasturelands are obliged to maintain biodiversity and natural resources through sustainable management.

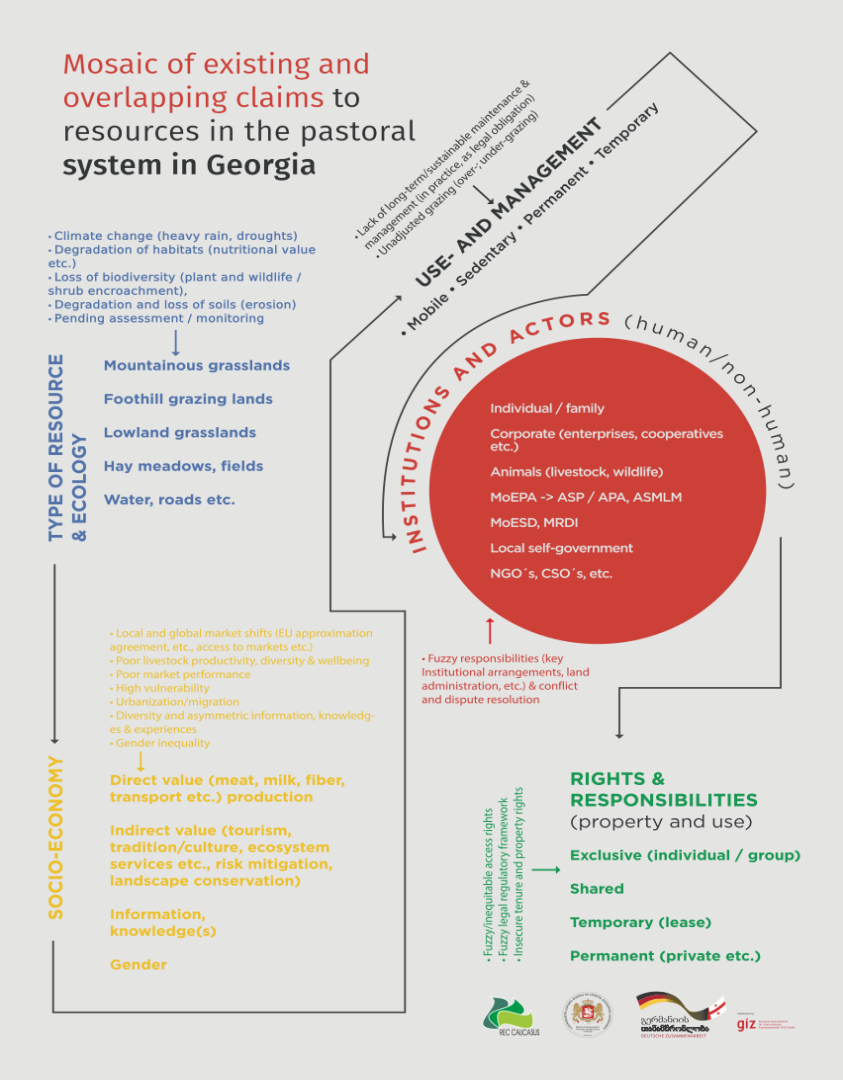
Understanding of obligations of all parties is important, i.e.:

- Preservation/improvement of ecological condition by introducing sustainable management of pastures;
- Provision of accessibility to and participatory management of natural resources.

These all call for essential engagement of livestock owners, communities, civil society organization, local government and other relevant institutional bodies in decision-making and pasture management.

7. CONCLUSIONS AND RECOMMENDATIONS

As it could be shown in the report, the pastoral system in Georgia is highly complex and entails a mosaic of exiting and overlapping claims to pastoral resources (see graph below). The pastoral resources themselves include not only pastureland in different climatic zones and thus with different ecological conditions determining their use, but also hay meadows, water bodies, road-infrastructure etc. which are threatened by different factors (e.g. climate change, degradation et., but also by claims external to the pastoral system (e.g. losing pastures to mining activities, energy and infrastructure etc.). Furthermore, different types of land use-and management can result in different, but often overlapping, claims which may include conflicts such as between mobile and sedentary pasture users. In addition, different socio-economic claims (such as economic values directly indirectly derived from pastoralism and pasture-resource) occur, which need to be reflected in policy making. These also entail the reflection of rather cross-cutting socio-economic aspects such as knowledge, education and gender. Institutionally, the claims to resources are also often diverse and overlapping with individual and cooperative farmers etc. claiming access to pasture lands based on different property and use arrangement that are under the responsibility of various institutions which may have further responsibilities and claim with regards to the use, management and planning of pastoral resources.



Graph 2: Mosaic of overlapping claims to pastures in the pastoral system in Georgia and the respective threats and challenges

For the establishment of a State Programme for Sustainable Pasture Management in Georgia it is recommended to include all those different claims and factors by constantly involving a broad range of different stakeholder with diverse knowledges and perspectives and facilitate a vital exchange though the "National Pasture Management Platform in Georgia" launched in October 2019.

Recommendations

The table below summarizes main challenges identified by status analysis of pastures management in Georgia and lays out recommendations for development of sustainable management program of pastures. The challenges in pasture management system are grouped by three components:

1. Policy, legal and institutional issues;
2. Planning, data availability and pasture use practices;
3. Cross cutting aspects

Topic	Challenges identified	Recommendations for state program of pastures sustainable management
1. Policy, legal and institutional issues		
General	Mosaic of co-existing and overlapping legal acts and claims to resources with weakly defined boundaries with "fuzzy" access rights and responsibilities - No unified pasture management policy and strategy in place. Pasture management issues are incorporated into several strategic documents, Due to the gaps in legislation, the pasture ownership issues are very vague. For instance, on the one hand it	Design of a legal framework/legislation and institutional framework to unify and harmonize existing laws: - Clarification and disaggregation of rights and responsibilities of different entities (relevant within the pastoral system). - Considering pastures as part of wider grazing systems, often spanning multiple ecosystems and territories used by different social and economic categories of livestock holder, with different priorities and reasons to engage in livestock production (ELD)

	is prohibited to transfer the pastures in ownership to anybody (including the local municipalities); Moratorium for renting the state-owned pastures. On the other hand, there is no obligation of indicating category of the agricultural land in process of its registration. Accordingly, the municipalities or individuals can register pastures in their ownership as an agricultural land; Due to the huge gaps in the system of renting of the state-owned pastures, in practice big majority of farmers are using pastures informally; The process of land registration does not require indicating its category, hence, there is no information on registered pastures in cadastre; The law does not define the grounds and procedures for changing agricultural land categories; The spatial planning legislation does not require identification of pastures and hayfields in the process of land use plan development, and neither do they require development of the respective management plans for such territories; The legislation defines only general requirements on sustainable pasture management, but do not set the enforcement mechanisms and responsible entities; it is impossible to control the enforcement of legal requirements and bans, since the specific norms and rules for the pasture use are not stipulated; neither are the fines for non-compliance or violations;	Develop and agree pasture management frameworks. The purpose of such framework shall be establishment of unified, consistent pasture management approach that would help us in conserving biodiversity at natural pastures and in improving fertility of the cultivated ones, as well as in ensuring sustainable development of livestock farming and increasing agricultural productivity. Prepare legal and institutional changes on basis of the framework, with the view of ensuring sustainable pasture management. Incorporate into the legislation the requirement of identifying natural and cultivated pastures/hayfields as a separate land category and considering the pastures/hayfields in the process of spatial planning. Set out in legislation the requirement of developing the management plans for municipality- and private-owned natural pastures, in order to ensure conservation of their biodiversity and fertility; For the municipality- and state-owned pastures, set out in the legislation priority use rights for the local communities that are already using them. Carry out feasibility study for transfer of the state-owned pastures into the municipal/private ownership; Identify the authority/authorities responsible for management of state-owned natural pastures; setting out the obligation of developing management and monitoring plans; setting the specific conditions for rent with the participation of stakeholders; sharing experience of APA on determining rent conditions for the pastures.

	The legislation does not include requirements for the sustainable use of winter pastures; There is no state authority responsible for pasture management in the county, authority that would be responsible for control of the pasture use and monitoring of their status. The entity responsible for rational use of the pastures is not identified.	
2019 Law on Land Use Designation and Sustainable Management of Agricultural Land	There are no procedures to ensure public participation, especially the interests of local pasture-user communities, while changing land categories Rules and terms for changing land category (from agriculture to not agriculture lands) does not exists or are not clear when the reason is development, such as infrastructure projects, mining, energy generation and transmission. Compensation measures are not defined when pastures are used for mining.	Eleboration of legislation amendments enshuring to ensure public paticipaition and the involvement of local communities while changing land use categories, as well as to define compensation measures.
2010 Law on State Property	Leased out of pastures via electronic auction based on highest bid - Favors economically well of people, not necessarily actual/primary pasture users - The lessees themselves lease pastures to local residents.	- greater decentralisation of allocation or management of pastures (ELD) - Lease of pastures to actual primary users (based on user need (actual users; nr. of LS…) and via local institutions, not centrally governed
2010 Law on State Property	- No conditions ensuring sustainable management of pastures followed neither in	- Establishment of baseline conditions ensuring sustainable management of all types of pastures;

	leasing the pastures by the state, nor in leasing them by lessees.	- Legally established modes of pastures utilization and obligations of parties involved in grazing.
2003 Law on Soil Conservation	Excessive grazing leading to erosion on high mountain pastures is prohibited. - the law makes no reference to winter pastures, nor does it provide official norms for stocking rates.	- Legislation/law including all types of pastures (i.e. not only summer, but also winter, intermediary and village pastures) - Stocking rates defined by law?
2017 Government Resolution 265 on Rational Use of Pasture and Hay land in High Mountainous Regions	Specifies conditions for pastures to be leased to cooperatives in high mountain areas.	- Review of the program and lessons learnt for other regions
2018 Law on Spatial Planning	Creates a framework for zoning and land management at the municipality level. - But this level of government has little regulatory power over pasture, which is mostly private, or state owned.	
Village pastures	No legal regulations regarding village pastures	- Nested institutions and common resource property management on village pastures, or even beyond, in particular where livestock themselves are collectively herded (ELD 2018)

Transhumance routes/ livestock mobility	- No responsible body for implementing Veterinary and Sanitary Rule for herding the animals to seasonal pastures (approved by Ordinance #422 dated December 31, 2013, by the Government of Georgia). - pastoral mobility not reflected legally	- Set up of Management body and structure, including annual moving and management plans. - Pastoral mobility reflected as a legal right: Orientation on "Pasture Law of the Kyrgyz Republic" of 2009 including the following key elements covering mobility (MoEP/EU/UNDP 2016:7): a) delegation of pasture management responsibility to community-based inclusive and representative committees; b) a shift in the system of pasture rights allocation, from area-based to a system using 'pasture tickets' to determine the number of animal grazing days and the grazing routes; and c) integrated management of low, middle and upper altitude pastures to allow better seasonal movement of livestock. -> Alternatively, it is proposed (by participants of the validation workshop of this project in October 2019) to replace animal movement by transportation and to develop phase out strategy for economic transhumance roads (for south trans-regional route)
Institutional responsibilities		Many users have strong traditional claims on pasture which they are unable to realize legally. These issues could perhaps be partially addressed through greater decentralization of allocation or management. (ELD 2018)
2. Planning, data availability and pasture use practices		
Planning and data availability	Measures for pastureland rehabilitation for the maintenance of natural grass composition and, in parallel, improvement of pastureland productivity lacking	These measures might include: - Establishment of rules of utilization of pastures (for instance, rotational or regulated grazing); - Legal issues of pastures utilization and obligations of parties involved in grazing; - Determination of pastures' borders;

		- Determination of loading rates/stocking rates; - Establishment of prohibitive rules of temporary or long-term grazing; - Determination of grazing season (i.e. starting and finishing points of the grazing period); - Determination of height of grazing; - Pasture fertilization measures; - Measures against weeds; - Measures against fire; - Monitoring issues (i.e. monitoring of pasture quality but also compliance with rules and regulations); - Revision of management plans. Technical solutions would benefit from field demonstration before they can be recommended (ELD 2018).
Pasture use practices	There is practically no grazing control at state-owned pastures. They are overloaded and uncontrolled. Hence, big part of the pastures is overgrazed, degraded and unfertile. Overgrazing threatens local plant diversity. It also causes replacement of the primary vegetation by inedible species (weeds) and results in decreasing species diversity. Forests adjacent to the human settlements are mainly overgrazed to the levels significantly exceeding their natural potential. Overgrazing damages grass, underwood and young stock, which, in its turn, causes	Set the obligation of developing and implementing the pasture management plans at municipal level; establish pasture management plan implementation control and monitoring schemes; Prepare guidelines for pasture management plan development; *The management plan shall be developed in consideration of the pastures' specificities (natural or artificial pasture, its status, species composition of the vegetation cover, grazing calendar, allowable number of heads, preferred grazing regime shall be selected according to the pasture type);* Plan and conduct the respective trainings on sustainable pasture management for farmers and municipality representatives;

	erosion and landslides, as well as the loss of the forest habitats. Low energy value and non-reliable epizootic status of summer and winter pastures, as well as lack of feeding resources in the winter period creates the significant barriers to the livestock farming development. Lack of the control at the transhumance routes generates acute problems for both, farmers and the state. In particular, the risk of spread of especially dangerous animal diseases throughout region and country significantly increases and unfavourable epizootic environment is created.	Inform farmers, conduct sustainable management awareness raising and education campaigns, with the involvement of municipalities and agricultural extension centres. Plan and implement demonstrational projects on sustainable pasture management.
Ensuring access to information/data on pasture management planning and pastures for spatial planning and livestock farming sector representatives	It's been years, since water balance was discussed in Georgia. Therefore, the actual data on land fund distribution are not available; No data on accurate areas and spatial distribution of state, municipality and private pastures are available; In the process of pasture spatial distribution identification, the old soviet maps are used, though they are obsolete and do not reflect reality; Vast majority of the pastures rented out by the municipalities are not registered in the public registry; The local authorities register only the renters and the areas of the land plots (but not their categories – ploughland, pasture, etc.), hence, no information on the rented pastures is available;	Cary out pasture and hayfield inventory and drawing up their cadastre. The action recommended by the Agriculture Development Strategy – introduce the land use technologies analogical to GIS (LPID - Land Parcel Identification System used in the EU countries); Cary out inventory of private and municipal pastures, reflect the cadastre data in the Public Registry. Cary out inventory of state-owned pastures, reflect the cadastre data in the Public Registry, categorise in natural and cultivated (pastures) on basis of the respective assessment. Develop pasture classification system and classify them in natural and cultivated.

	Only 20 to 30% of the agricultural lands are registered in the Public Registry, and the cadastre data of the registered lands not always contains information on its category. Accordingly, information (location, area) even on the pastures registered in the Public Registry is not always available; Pasture management plans are developed for only few ones located within the boundaries of protected areas. The law does not require development of the pasture management plans. The rent agreements do not contain the specific conditions for sustainable pasture management (i.e., identification of the number of heads to graze on the plot, status of the pasture, grazing calendar and regimes, etc.).	Set the obligation of categorising municipality-owned agricultural lands (ploughlands, perennial plantations, pastures/hayfields) within certain period; Set the legal obligation of indicating category of the agricultural lands in process of their registration. Develop natural pasture management plan on basis of the experience gained in process of managing pastures located at the PAs. The management plan shall be the part of the rent agreement and shall be mandatory of the renter.
3. Cross cutting aspects		
Ecology	Natural resources (different types of pasture lands, hay meadows, water, etc.) highly unpredictable and dynamic in nature - Makes monitoring of degradation challenging	- Establishment of monitoring system capable to deal with change (of natural resources, climate change, varying stocking rates, etc.)
Biodiversity and soil	Loss of biodiversity and soil (land degradation)	- LDN-process
Climate change	Raising temperatures, drought and changes in species composition	
Socio-economy	Determination of total economic value of pastoralism and comparison with other system difficult, because of	- Develop methodology for total economic valuation of pasture lands and pastoralism

	- Direct (meat, milk, fiber, transport, etc.) - and indirect value (agritourism, ESS, risk mitigation, culture, etc.) production	
Gender	Gender equality concerns and the gendered dimensions of specific problems are largely absent from regional development strategies	- amended policies reflecting Gender (UNDP) - increased supervision (Ministry of Regional Development and Infrastructure)
Transhumance routes/ livestock mobility	- Migration infrastructure for mobile herds in Georgia generally lacks regulation (Neudert et al. 2017): - Infrastructure, resting points, bridges, etc. - Veterinary controls (fear of spread of livestock diseases) - Security control - Migration roads are sometimes blocked by private land - Conflicts of interest between villagers and transhumance farmers - Lack of information and credibility of available information - Compliance with regulations (EU) - Demarcation of the borders of transhumance routes missing	- Development of infrastructure on transhumance roads (roads and animal movement) - Development of services (veterinary, human services, security and animal well fare) - Demarcation of the borders of transhumance routes - Solving ownership issues including expropriation of privately-owned parts of transhumance routes as the last option if there is no agreement with owners - Development of infrastructure on winter and summer pastures (human, animal tourism) - Development of services (veterinary, human services, security and animal well fare) - Create code of conduct describing rules for cultural heritage/ transhumance - Develop training program for skill development based on code of conduct (for youth, visitors, tourists) and integrate mentioned vocational education system

	- Transhumance as Cultural Heritage including the development of legal framework for cultural heritage of Tusheti, Tianeti, Khevi transhumance roads. - To increase border control to avoid accidental crossing of borders by animals (borders with Azerbaijan and Armenia)

Challenges and recommendations by pasture types

WINTER AND SUMMER PASTURES - Working group results of validation workshop (facilitated by Kakha Artsivadze/Mikheil Kurdadze), October 2019			
	Challenges identified	**Recommendations (What needs to be changed?)**	**Major concerns**
1	Inventory issues/problems	Supporting development of indoor feeding	Lack of finances and political will
2	High rate of degradation	Education and awareness raising	Disagreement of different stakeholders (political groups)
3	Difference between density/stoking rate among summer and winter pastures	Production of Hays	Lack of scientific knowledge and accessibility (statistics)
4	Chaos in transhumance process	Lamb market	Political changes and instability
5	High rate of livestock density on private owned land	State program on pasture inventory	Lack of interest from state and donors to support educational programs
6	Lack of legal ownership (on main part of pastures)	Implementation of management plan	Frequent shift of decision makers
7	High level of livestock density of illegally used pastures	Creation of mechanism for financial initiatives	
8	Lack of awareness education	Risk assessment especially for the topic marked as # prognosis	
9	Climate Change	Development of Infrastructure	
10	Pasture/ Agricultural land/no more pasture-economic loss/ Lack of cattle	Legislative initiatives in pasture management	
11	Water deficiency on winter pasture leading to everyday migration and land erosion	Training and awareness raising campaigns	
12	No legal guarantees for leasers – they pay to the state without contracts	Adaptation Plans	

13	(Bad) Practice burning pastures and no mechanism of calculating the loss/damage		
14	Problem of spatial distribution on summer pastures –Refusing to use pastures that are far from the villages an roads		
	Problem of transhumance road		
VILLAGE PASTURES –Working group results of validation workshop (facilitated by Sophiko Akhobadze/Natha Tkhilava) October 2019			
1	Conflict between transhumance and local residents	Waste Management	Lack of rural development planning
2	Lack of planning (fodder basis)	Diversification/resilience	Lack of access to best practices
3	Free riding	Participatory land use planning (financial)	Lack of trust
4	Uneven distribution of grazing	Initiatives to facilitate forage production	Lack of willingness to cooperate
5	Animal productivity	Adaptive management based on field condition (holistic/rotational)	Credibility of available information
6	Lack of communication within communities	To create model of pasture committee	Lack of information on livestock and pastures
7	Lack of common management practice	Engagement of Youth	Fragmented legislation
8	Low awareness		No land policy and long-term vision
9	Lack of participation in local decision-making (participation of locals)		Lack of spatial information
10	Access to traditionally used areas		
11	Land use changes		
12	Losing pastures by mining activities (energy and infrastructure)		
13	Forestation		

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