



Forest Ecosystem Services in Georgia

Enabling the implementation of Georgia's Forest Sector Reform - **ECO.Georgia**

Report

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July 2023

Published by

Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH

Registered offices

Bonn and Eschborn, Germany

Enabling the implementation of Georgia’s Forest Sector Reform – ECO.Georgia

Ministry of Environment Protection and Agriculture
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July 2023

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This document has been prepared by Robert Hostnik within the framework of the project “Enabling the Implementation of Georgia’s Forest Sector Reform - ECO.Georgia”, funded by the Green Climate Fund (GCF), the German Federal Ministry for Economic Cooperation and Development (BMZ), the Swiss Development Cooperation (SDC) and the Government of Georgia (GoG) and implemented by Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ), the Ministry of Environmental Protection and Agriculture of Georgia (MEPA), through its subordinated agencies and the Ministry of Economy and Sustainable Development of Georgia (MoESD).

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Executive summary

The Forest Ecosystem Services (FES) assignment in Georgia aimed to contribute to the development of a methodology for assessing forest ecosystem services within the ECO.Georgia project. This assignment was divided into three phases: (1) Study of selected documents and materials, (2) Preparation of a Workshop on participatory mapping of Forest Ecosystem Services and (3) Implementation and Analysis of the Workshop

Due to the limited three-week timeframe, the focus of the assignment was on a structured and comprehensive approach to assess forest ecosystem services in Georgia through participatory mapping.

An evaluation of two proposed methodologies revealed that the ECO CARST methodology guidelines were useful and highly suitable for identifying, mapping, and evaluating forest ecosystem services. On the other hand, the methodology of the Forest Ecosystem Service Procedure, which follows the FSC Certification scheme with its seven-step procedure, proved to be quite demanding given the current status and level of development of FES in Georgia.

The legal framework for the development of forest ecosystem services in Georgia is primarily based on the country's constitution, as well as various policy documents, laws, and regulations. In recent years, Georgia has made significant efforts to shift from unsustainable forest management practices to more sustainable and conservation-oriented approaches. The Forest Code of Georgia, along with other policy documents, provides a strong legal foundation for these efforts.

Despite these positive steps, challenges such as illegal logging, social cutting and land-use conflicts persist. Ongoing efforts are essential to protect and enhance forest ecosystem services in Georgia. International cooperation, such as the ECO.Georgia project and conservation partnerships, continue to play a vital role in addressing these challenges.

The overview of the current state and development of Forest Ecosystem Services in Georgia highlights that forest policy recognizes FES integration into planning as a key element of sustainable forest management. It also underscores the substantial dependence of local communities on several forest ecosystem services and their significance for livelihoods, environmental well-being, and economic activities.

The workshop on participatory mapping of Forest Ecosystem Services involved presentations, group discussions, participatory mapping exercises, and interactive activities to engage participants. Stakeholders, including government agencies, local communities, NGOs, and experts, ensured a well-rounded and inclusive discussion.

During the workshop, fundamental definitions and categorizations of Ecosystem Services, along with practical examples, were presented. Participants were then tasked with identifying and listing the most important FES in the Akhmeta Forest District and mapping the forest locations where these ecosystem functions were prominent. The proposals generated by the groups will undergo thorough analysis, synthesis, and consideration for inclusion in the forest management plan.

The format, agenda, and duration of the participatory mapping workshop for Forest Ecosystem Services were successful, and we recommend its future use with individualized adjustments based on local contexts and content.

In summary, despite the relatively short three-week timeframe, this assignment has made a useful contribution to the future development of a structured and comprehensive approach to assess forest ecosystem services in Georgia through participatory processes.

Table of Content

Executive summary	iii
Table of Content	iv
List of Figures	v
List of Abbreviations	vi
1 Introduction	7
2 Methodology and Scope	8
3 About Forest Ecosystem Services	10
3.1 Forest Ecosystem Services in general.....	10
3.2 Forest Ecosystem Services & Forest Functions.....	13
4 Examples of selected methodologies for evaluating Forest Ecosystem Services	14
4.1 ECO KARST Ecosystem Services Assessment Process.....	14
4.2 FSC Ecosystem Services Procedure: Impact Demonstration and Market Tools	15
5 Forest Ecosystem Services in Georgia	17
5.1 Historical Context.....	17
5.2. Legal framework.....	17
5.3 Ongoing Forest Ecosystem Services development efforts	19
6 Workshop on Participatory Mapping of Forest Ecosystem Services	21
6.1. Preparation of the Workshop.....	21
6.2 Implementation of the Workshop.....	25
7 Other Assignment Activities	30
8 Recommendations	32
9 Conclusions	33
10 References	34

List of Figures

<i>Fig. 1: Ecosystem Services and Constitutents of Well-being</i>	10
<i>Fig. 2: Development of ecosystem concepts over time</i>	11
<i>Fig. 3: Ecosystem Services are bridge between human and natural world</i>	12
<i>Fig. 4: Forest Ecosystem Functions and Services</i>	13
<i>Fig. 5: The five domains of ES assessment</i>	14
<i>Fig. 6. The seven steps required to demonstrate ecosystem services impacts</i>	16
<i>Fig. 7: Landscape of the Eagle Gorge Natural Monument</i>	21
<i>Fig. 8-11: The Tbilisi Urban Forests in the areas of Turtle Lake and Mtatsminda Ridge</i>	22
<i>Fig. 12-13: The Tbilisi Urban Forests in the areas of Turtle Lake and Mtatsminda Ridge.</i>	23
<i>Fig. 14-16: Zelkova tree groves in the Babaneuri State Nature Reserve.</i>	23
<i>Fig. 17: Agenda of the Workshop</i>	25
<i>Fig. 18: Presentation slides: Theoretical background on ES and Approach</i>	26
<i>Fig. 19-20: Participants and the Agenda of the Workshop</i>	26
<i>Fig. 21: The genetral question to the participants in the second part of the workshop</i>	27
<i>Fig. 22-23: Answers of the participants categorized by types of FES</i>	28
<i>Fig. 24-26: Group work on mapping of the Forest Ecosystem Services</i>	28
<i>Fig. 30-32: Results and proposals presentations by groups.</i>	29
<i>Fig. 33: Presentation slides: "Urban Forests: A Modern Forest Management Challenge.</i>	31

List of Abbreviations

APA	Agency of Protected Areas
CENN	Caucasus Environmental NGOs Network
ES	Ecosystem Service FES Forest Ecosystem Service
FSC	Forest Stewardship Council
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH
MA	Millennium Ecosystem Assessment
NFA	National Forestry Agency
NFI	National Forestry Inventory
NGO	Nongovernmental Organisation
TEEB	The Economics of Ecosystems and Biodiversity

1 Introduction

To drive a transformation in conventional forestry practices, the ECO.Georgia project places significant emphasis on training initiatives focused on sustainable forest management. An important aspect of sustainable forest management involves evaluating forest ecosystem services and integrating them into planning processes.

This assignment entails several key components within the ECO.Georgia project:

Contribution to the creation of a methodology for assessing forest ecosystem services, aligning with the project's objectives.

The assistance will in preparing the methodology for assessing forest ecosystem services. This includes activities like identification, participatory mapping, and quantification, with a practical example from the Akhmeta forest district.

Involving stakeholders in evaluating Forest Ecosystem Services (FES) through workshop and collaborative efforts.

Providing an overview of the Forest Ecosystem Service Procedure, following the guidelines of the FSC Certification scheme with detailed description and explanation of the seven steps involved in the FSC Ecosystem Service Procedure.

The intended audience for these activities comprises NFA staff, specifically professionals specializing in forest inventory, planning, and forest utilization. Additionally, these initiatives are open to a wide range of relevant stakeholders, including local community representatives, NGOs, and others interested in participating in public engagement efforts.

2 Methodology and Scope

The purpose of the assignment was to contribute in the development of the methodology for the assessment of the forest ecosystem services within the ECO.Georgia project.

Given the relatively brief three-week timeline, the primary emphasis was placed on planning, executing, and analysis of the workshop dedicated to the practice of participatory mapping of Forest Ecosystem Services.

The approach was structured around three distinct phases:

1. Study of Existing Documents and Materials:

- Reviewing existing methodologies: This phase involves researching and reviewing two proposed existing methodologies used for identifying, mapping, and evaluating forest ecosystem services. This step is important to ensure that the workshop's approach aligns with best practices and established methods.
- Overview of development of forest ecosystem services in Georgia to provide the context for the workshop.

2. Preparation of the Workshop:

- Field briefing and site visits to gain firsthand knowledge and a practical understanding of the ecosystem services in question.
- Preparatory and coordination meetings for planning the workshop, defining its objectives, and ensuring logistics and details.
- Area selection - choosing a specific area for discussion and mapping during the workshop. This area should represent the diversity of forest ecosystem services and challenges faced in Georgia.
- Stakeholder identification - identifying and inviting relevant stakeholders to participate in the workshop for ensuring a well-rounded and inclusive discussion. Stakeholders include government agencies, local communities, NGOs, and experts.
- Workshop location - selecting an appropriate location for the workshop that is easily accessible to participants and provides the necessary facilities and resources for the event.
- Preparation of materials - developing the necessary materials, such as maps, data, presentations, and worksheets, to support the workshop's activities and discussions.

3. Implementation and Analysis of the Workshop:

- Conducting the workshop itself, which involves presentations, group discussions, participatory mapping exercises, and interactive activities to engage participants.
- Analysis - after the workshop, analyzing the outcomes, data collected, and feedback from participants. This analysis helps draw conclusions and identify key findings related to forest ecosystem services in the chosen area.

Overall, the assignment was focused on a structured and comprehensive approach to assess forest ecosystem services in Georgia through participatory mapping. This approach ensures that the assessment process is well-informed, inclusive, and capable of producing valuable insights for the ECO.Georgia project.

It also emphasizes collaboration with stakeholders and experts to gather diverse perspectives and knowledge about forest ecosystem services in the region.

3 About Forest Ecosystem Services

3.1 Forest Ecosystem Services in general

According to the Millennium Ecosystem Assessment (MA, 2005), Ecosystem Services are **the benefits that people obtain from ecosystems.**

The Economics of Ecosystems and Biodiversity (TEEB, 2010) defines them as **the direct and indirect contributions of ecosystems to human well-being.**

Forest ecosystem services (FES) are the benefits that humans derive from forest ecosystems. They are the tangible and intangible goods and services that forests provide to people. Forest ecosystem services can be categorized into four main types:

1. Provisioning Services: These are the tangible products or resources that forests provide, such as timber, fuelwood, food (fruits, nuts, mushrooms), medicinal plants, and non-timber forest products.

2. Regulating Services: These services involve the regulation and control of natural processes, which benefit society. Examples include climate regulation (through carbon sequestration and storage), water regulation (including water purification and regulation of water flows), soil erosion control, and natural disaster mitigation.

3. Supporting Services: Supporting services are the underlying processes and functions that enable other ecosystem services to occur. They include soil formation, nutrient cycling, primary production (photosynthesis), and habitat creation that supports biodiversity.

4. Cultural Services: Cultural services encompass the non-material benefits that forests provide, such as aesthetic enjoyment, recreational opportunities, cultural and spiritual values, inspiration for art and literature, and educational and research opportunities.

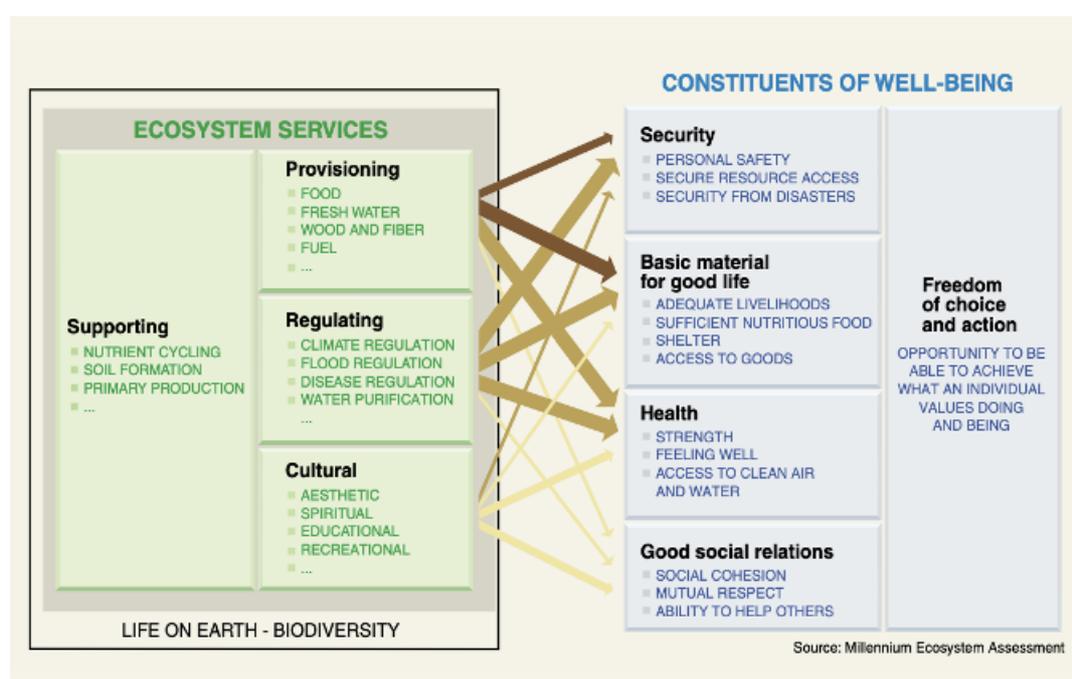


Fig1: Ecosystem Services and Constituents of Well-being (MA, 2005)

Other definitions that are related to the forest ecosystem services are:

- *Ecosystem* is defined as a natural unit consisting of all plants, animals and micro-organisms.
- *Ecosystem function* refers to the processes and interactions that occur within an ecosystem, including the flow of energy and cycling of nutrient.
- *Natural capital* refers to the elements of the natural environment which provide valuable goods and services to people.
- *PES - Payments for Ecosystem Services* is market-based approach that involves compensating individuals or communities for the conservation or sustainable management of ecosystem they provide.

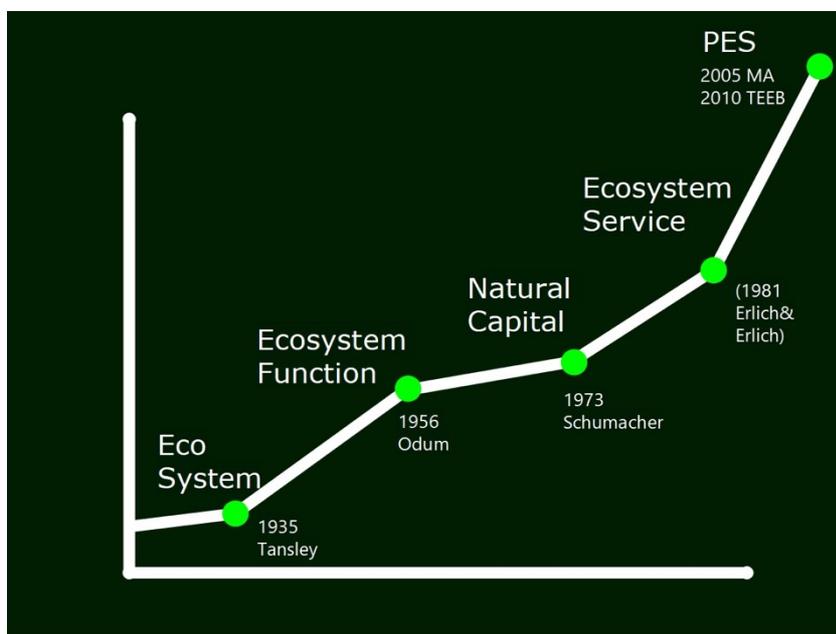


Fig. 2: Development of ecosystem concepts over time (y-axis is figurative) (Hostnik, 2023)

Some key and salient forest ecosystem services are:

Carbon sequestration: mitigating climate change by absorbing and storing carbon dioxide from the atmosphere through the process of photosynthesis. Forests act as a carbon sink, helping to reduce the concentration of greenhouse gases and mitigate global warming.

Biodiversity conservation: forests provide habitats, food, and shelter for numerous organisms, promoting ecological balance and preserving the genetic diversity.

Erosion control is a critical ecosystem service provided by forests, encompassing a range of processes and benefits that help protect soil integrity and prevent the displacement of topsoil due to the forces of wind, water, and gravity.

Water regulation (regulating water cycles): forests act as natural watersheds, helping to maintain a steady flow of water in streams, rivers, and underground aquifers. Forests help prevent soil erosion, filter pollutants, and improve water quality, thereby supporting freshwater availability and reducing the risk of floods and droughts.

Provision of timber and non-timber forest products: forests are a valuable source of timber. They also offer a wide range of non-timber forest products, such as fruits, nuts and medicinal plants which are essential for livelihoods and cultural practices of local communities.

Ecotourism and recreation: forests attract visitors for recreation, nature appreciation, and ecotourism. Forests offer activities like hiking, wildlife observation, and photography, contributing to local economies and promoting a deeper understanding of nature's value.

Air purification: forests act as natural filters, absorbing air pollutants and releasing oxygen. Through the process of photosynthesis, trees remove harmful gases and particulate matter from the air, improving air quality.

Soil fertility and nutrient cycling: forests contribute to soil formation and fertility by enhancing organic matter accumulation and nutrient cycling.

Climate regulation: forests influence local and regional climates by providing shade, reducing temperatures through evapotranspiration, and influencing rainfall patterns. They help create microclimates, maintain humidity, and protect against extreme weather events.

Cultural and Spiritual Values: forests often hold cultural and spiritual significance for local communities, playing a role in their identity and traditions.

Pollination: forests provide habitat for pollinators like bees and butterflies, which are essential for the reproduction of many plant species, including food crops.

Medicinal Resources: Many medicinal plants and traditional remedies come from forests, contributing to healthcare and pharmaceutical industries.

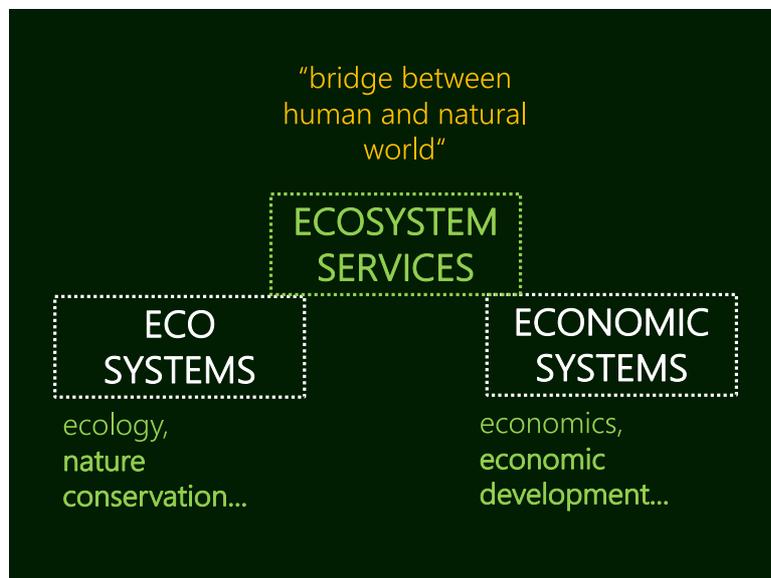


Fig. 3: Ecosystem Services are bridge between human and natural world (Hostnik, 2023)

These services are interconnected, and the loss or degradation of one can have cascading effects on others. Therefore, conserving and sustainably managing forests is essential to ensure the continued provision of these vital ecosystem services.

3.2 Forest Ecosystem Services & Forest Functions

It is important to differentiate between forest ecosystem services and forest ecosystem functions:

- *forest ecosystem functions* refer to the natural processes and activities within a forest ecosystem, while
- *forest ecosystem services* are the tangible and intangible benefits that people obtain from forests.

Ecosystem functions are essential for the sustainability of the forest ecosystem itself, while ecosystem services are the contributions that forests make to human well-being and society.

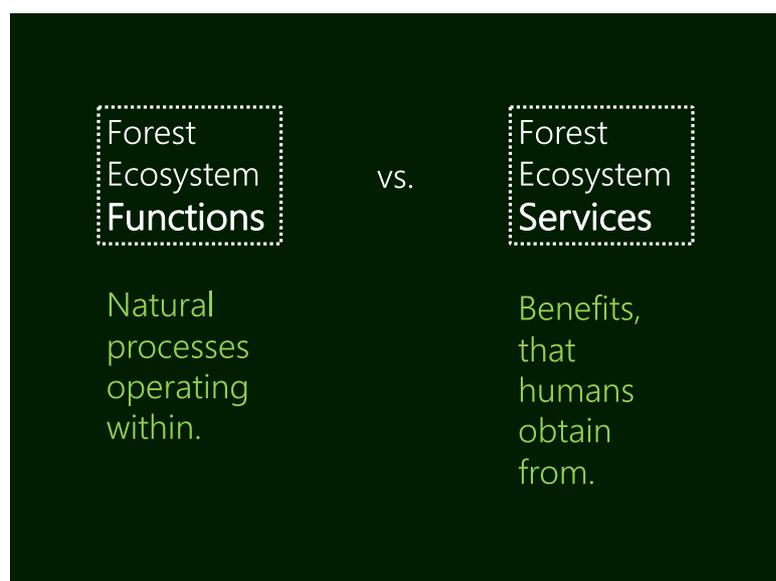


Fig. 4: Forest Ecosystem Functions and Services (Hostnik, 2023)

4 Examples of selected methodologies for evaluating Forest Ecosystem Services

Two pre-existing methodologies for assessing forest ecosystem services were initially considered as foundational frameworks for this study visit:

4.1 ECO KARST Ecosystem Services Assessment Process

The assessment process under ECO KARST Interreg Project (ECO Karst, Interreg Danube: Mapping of ecosystem services at regional level, A practical guide, 2019) consists of five distinct domains, each serving specific objectives:



Fig. 5: The five domains of ES assessment (ECO Karst, Interreg Danube: Mapping of ecosystem services at regional level, A practical guide, 2019)

1. Identification of Ecosystem Types and Creation of an Ecosystem Type Map

This step involves delineating the area under evaluation, selecting an appropriate categorization for ecosystem types, and crafting an ecosystem type map.

2. Identification and Prioritization of Ecosystem Services

The process entails identifying locally relevant ecosystem services through desktop research and semi-structured interviews. It also involves selecting research priorities based on the prioritization of ecosystem services using specific criteria or preference assessment surveys.

3. Stakeholder Identification and Involvement

This phase involves a deep dive into the power dynamics among various stakeholder groups and a comprehensive analysis of the social network within local stakeholders. The goal is to identify key influencers, detect communication gaps, and discern patterns of information sharing.

4. Mapping of Ecosystem Services

Utilizing a rule-based model, this stage focuses on mapping the condition of ecosystems and the provision of ecosystem services. Detailed methodologies are provided for indicators most frequently employed in the ECO KARST approach.

5. Economic Assessment of Ecosystem Services

This final step centers on estimating the net profit generated by various provisioning ecosystem services in the market.

These methodologies serve as starting points for framing the assessment of forest ecosystem services within the context of the study visit, providing a comprehensive structure for the study's execution and analysis.

4.2 FSC Ecosystem Services Procedure: Impact Demonstration and Market Tools

The "Ecosystem Services Procedure: Impact Demonstration and Market Tools" (FSC Certification document. 2021. Ecosystem Service Procedure - Impact Demonstration and Market Tools", FSC-PRO-30-006 V1-2 EN, 2021) enriches the current framework by providing a method to validate impacts and promote FSC ecosystem services. This aligns seamlessly with the established Forest Stewardship Council (FSC) guidelines, which already require forest managers to proactively preserve, protect, and enhance ecosystem services and environmental values.

The seven-step procedure has been developed to demonstrate ecosystem services impacts:

Step 1: Identification of Ecosystem Services

- Identifying and formally acknowledging the ecosystem services.
- Enumerating the associated management objectives.

Step 2: Ecosystem Services Description

- Providing a comprehensive description for each ecosystem service.
- Present condition assessment.
- Historical conditions based on available data.
- Extent of influence within and beyond the management unit.
- Beneficiary groups.
- Identification of both human-induced and natural threats, both within and beyond the management unit.

Step 3: Development of a Theory of Change

- Proposing anticipated impacts for each ecosystem service.
- Formulating a coherent theory that establishes a connection between management activities and these projected impacts.
- Specification of actions contributing to the desired outcomes, encompassing threat mitigation strategies.

Step 4: Selection of Outcome Indicators

- Carefully selecting outcome indicators that are clear and appropriate for assessing progress.
- Establishing verifiable targets that represent the desired future conditions.
- Justifying the rationale behind the chosen targets, clarifying their significance.

Step 5: Methodology Description

- Providing explanation of the methodology employed for measuring the selected indicators.
- Detailing the process of data collection and analysis, encompassing data sources, sampling techniques, equipment usage, and analytical methods.

Step 6: Indicator Measurement and Comparison

- Measuring the current values of the selected indicators accurately.
- Conducting a comparative analysis between current values and predefined target values.

Step 7: Results Reporting

- Presenting compelling evidence demonstrating that current indicator values align with the required results.
- Elaborating on how these results actively contribute to the realization of future verifiable targets.

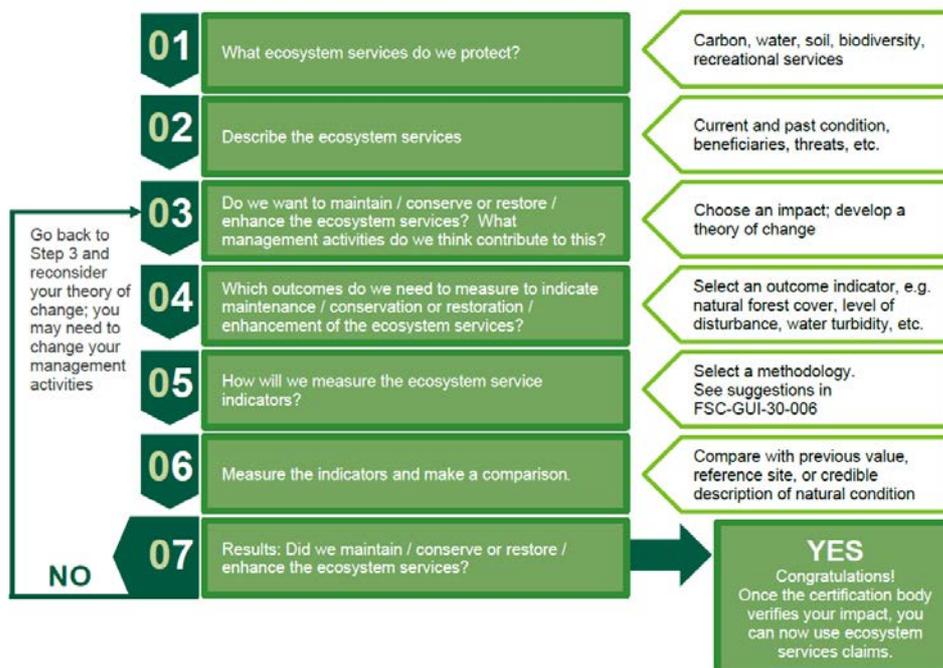


Fig. 6. The seven steps required to demonstrate ecosystem services impacts (FSC Certification document. 2021. Ecosystem Service Procedure - Impact Demonstration and Market Tools", FSC-PRO-30-006 V1-2 EN, 2021)

5 Forest Ecosystem Services in Georgia

Forest ecosystem services in the country of Georgia are influenced by a combination of historical context, legal frameworks, and ongoing development efforts.

5.1 Historical Context

- *Historical Land Use:* Georgia has a long history of forest use, including timber harvesting, fuelwood collection, and agriculture. Historical land use practices often had detrimental impacts on forests.
- *Soviet Era:* During the Soviet era, Georgia's forests were managed intensively, with a focus on timber production. This period saw significant deforestation and degradation of forest ecosystems.
- *Post-Soviet Transition:* After gaining independence from the Soviet Union, Georgia faced challenges in managing its forests, with issues such as illegal logging and inadequate forest management practices being prevalent.

In recent years, Georgia has made efforts to transition from unsustainable forest management practices to more sustainable and conservation-oriented approaches. The legal framework, including the Forest Code, reflects a commitment to these goals. However, challenges such as illegal logging, social cutting and land-use conflicts still exist, and ongoing efforts are required to protect and enhance forest ecosystem services in Georgia. International cooperation as ECO.Georgia project and conservation partnerships continue to play a role in these efforts.

5.2. Legal framework

The legal framework for forest ecosystem services in Georgia is primarily based on its constitution and various policy documents, laws and regulations: The National Forest Concept of Georgia (2014), The National Forestry Program and National Principles, Criteria and Indicators for Sustainable Forest Management (2017).

Georgia adopted a new Forest Code in 2020, which aimed to modernize forest management practices, promote sustainable forestry, and enhance biodiversity conservation.

The Forest Code of Georgia provides strong legal basis for forest ecosystem services development and preservation.

In *Article 1* it defines purposes of the Code, among them

- **to conserve** the biodiversity of the forest of Georgia in order for the environmental, social and economic functions of forest to be performed, to preserve and improve its qualitative properties, and the quantitative and qualitative characteristics of forest resources;
- **to preserve** the original natural and cultural environment of forest, including the vegetation cover and animal world, and natural and cultural property located in forest, and rare and endangered plant species;

FOREST CATEGORIES

In *Articles 6 to 11* it define Categorisation of forests and their management objectives. The forests of Georgia are divided into four categories:

1. **PROTECTED FORESTS** with aim to conserve biodiversity and to protect rare and/or endangered species and vulnerable ecosystems of the forest (a forest granted the status of a protected area, a riparian forest, an arid forest creating a natural landscape and a forest with a high concentration of forest forming species that are protected at the national level).
→ *SUPPORTING SERVICES*
2. **PROTECTION FORESTS** with objective to preserve and enhance the protective function of the forest: protecting settlements, agricultural land, cultural property/historic monuments, infrastructure and vulnerable land.
→ *REGULATING SERVICES*
3. **RESORT AND RECREATIONAL FORESTS** with objective to preserve and improve the recreational function, landscape and natural elements of the forest. This category includes forests around resorts, medical institutions, mineral springs, cities («urban forests») and other settlements used by the population for mass recreation, tourism, and sports and recreation activities.
→ *CULTURAL SERVICES*
4. **COMMERCIAL FORESTS** with objective to ensure the sustainable use of forest resources and to preserve the protective function of the forest (assigned to a forest performing soil protection and water regulation functions.)
→ *PROVISIONING SERVICES*

ENTERING AND MOVING AROUND IN THE FOREST

In *Article 31* the Forest Code defines entering and freely moving around in forest:

»Everyone has the right to enter and freely move around in forest for recreational and relaxation purposes.«

TYPES OF SPECIAL FOREST USE

Article 37 tangles forest ecosystem services by defining following types of special forest use which may be carried out in the forest of Georgia, including regulating issues:

a) **timber harvesting** through commercial felling (with special requirements for harvesting timber through commercial felling in forest stands located on slopes with an inclination angle of 31 to 36 degrees to prevent soil erosion – *Article 36*)

b) the harvesting of **non-wood forest products**, wood products and secondary wood materials – regulated by a forest management body granting a respective right to a legal person or based on the purposes of forest management and with limitation, that it shall not contravene the interests of sustainable forest management.

c) the establishment of a plantation forest;

d) forest use for agricultural purposes;

e) forest use for **resort, recreational, sports and other cultural and health enhancing purposes**;

f) the establishment of a fishing farm and/or a hunting area;

- g) the establishment of animal shelters and breeding sites;
- h) the construction of line structures for electronic communications networks;
- i) forest use for **scientific, research, and educational purposes**;
- j) special forest use for particular purposes.

THE PURPOSES OF PROTECTING THE FORESTS

In *Article 70* the Forest Code determines four purposes for forest protection, all of them clearly referring also to forest ecosystem services:

- 1) preservation and improvement of the ecological balance in forest;
- 2) prevention of erosion and bogging of forest soil, mud flow, avalanche and other processes which degrade the soil condition;
- 3) preservation of the original state of a virgin forest;
- 4) protection of relict, endemic and other rare species of plants.

5.3 Ongoing Forest Ecosystem Services development efforts

The forest policy of Georgia based on the National Forest Programme and the Forest Code identifies Forest Ecosystem Services and its integration into planning as one of the key elements of the sustainable forest management.

The main steps of this process are:

- a) Identification of **ecosystem types** and creation of **ecosystem type map**
- b) Identification and **prioritization of ecosystem services**
- c) **Stakeholder identification** and involvement
- d) **Mapping** of ecosystem services
- e) Defining the **management activities** to maintain, conserve or restore the ecosystem services
- f) Identification and measurement of **ecosystem services indicators**
- g) **Economic assessment** of ecosystem services

The recent study conducted by Kavtarishvili in 2022, titled "Identification of Forest Ecosystem Services (FES) and Beneficiaries of FES," based on data from eight target municipalities, draws the following key conclusions:

- Local communities have a significant reliance on forest ecosystem services (FES).
- Primary benefits for locals are derived from provisioning services, reflecting a heavy dependence on firewood for heating, grazing areas for livestock, beekeeping, gathering non-timber forest products, and the utilization of industrial timber.

- Local communities also recognize the vital importance of regulating and cultural services provided by forests. They understand how healthy forest ecosystems contribute to climate regulation, water management, the mitigation of extreme natural events, and the preservation of soil quality.
- Non-material benefits, categorized as cultural services, hold substantial value for local economies. These benefits include the development of tourism businesses and income generation, as well as the enjoyment of aesthetic and spiritual aspects of forests.
- While beneficiaries are well-acquainted with the mentioned services, there appears to be less familiarity with supporting services provided by forests.

In summary, the study highlights the strong dependence of local communities on forest ecosystem services, emphasizing the significance of these services for their livelihoods, environmental well-being, and economic activities. It also underscores the need for increased awareness and understanding of supporting services among beneficiaries.

6 Workshop on Participatory Mapping of Forest Ecosystem Services

6.1 Preparation of the Workshop

FIELD BRIEFING AND SITE VISITS

Field briefings and site visits were conducted to acquire firsthand knowledge, tactile experience, and a practical understanding of the ecosystem services under consideration.

The Eagle Gorge Natural Monument (01/06/2023)

A protected natural area situated in the Dedoplistskaro municipality in the southeastern part of Georgia, in the region of Kakheti which is known for its natural beauty and geological features. The area is rich in biodiversity, with various plant and animal species in the unique geological and environmental conditions of the gorge. It is also home to a diverse range of bird species. The monument is protected to preserve its natural and cultural heritage. Conservation efforts aim to maintain the ecological balance and protect the unique geological formations of the gorge.

The area offers opportunities for outdoor activities such as hiking, birdwatching, and photography. The dramatic cliffs and lush vegetation make it an attractive location for nature enthusiasts.

Relevant Forest Ecosystem Services: *biodiversity, ecotourism, recreation, education, cultural values.*

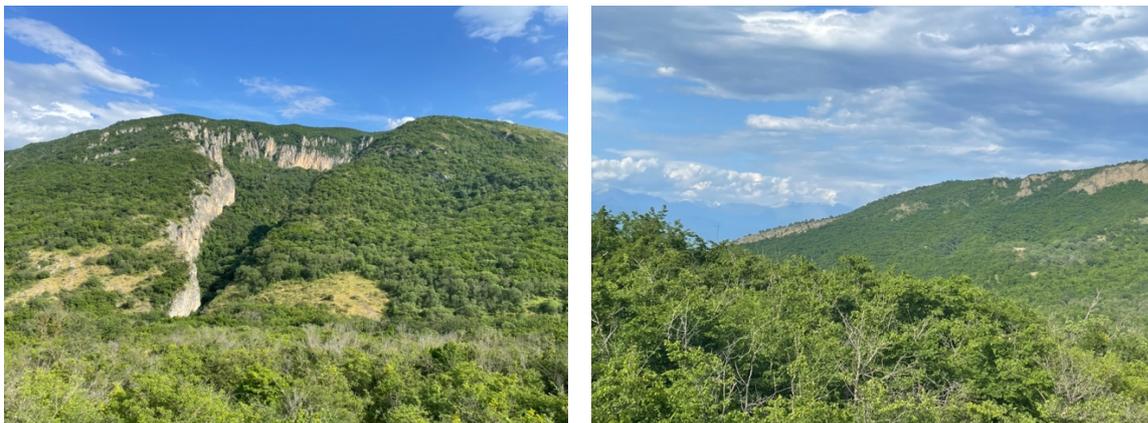


Fig. 7: Landscape of the Eagle Gorge Natural Monument

The Urban Forest of Tbilisi (04/06/2023)

The urban forest in the areas of Turtle Lake and Mtatsminda Ridge is situated on the outskirts of Tbilisi. The forest is characterized by a variety of tree species that provide shade and habitat for local wildlife. Turtle Mountain's urban forest is crisscrossed with hiking trails, making it a popular destination for nature enthusiasts and hikers. The marked Urban Forest Trail Network comprises an extensive 38 km of interconnected forest walking paths. The forest is home to various animal species, including birds, small mammals, and insects.

The forest offers educational trail and designated picnic areas. Visitors may come across remnants of old fortifications or structures, providing insights into the region's history.

The urban forest on Turtle Lake and Mtatsminda Ridge area offers a peaceful retreat where visitors can reconnect with the natural world, enjoy outdoor activities, and savor panoramic vistas of the city, all while being just a short distance from Tbilisi's urban center.

Relevant Forest Ecosystem Services: *biodiversity, recreation, education, cultural values, soil protection, climate regulation.*



Fig. 8-11: The Tbilisi Urban Forests in the areas of Turtle Lake and Mtatsminda Ridge.

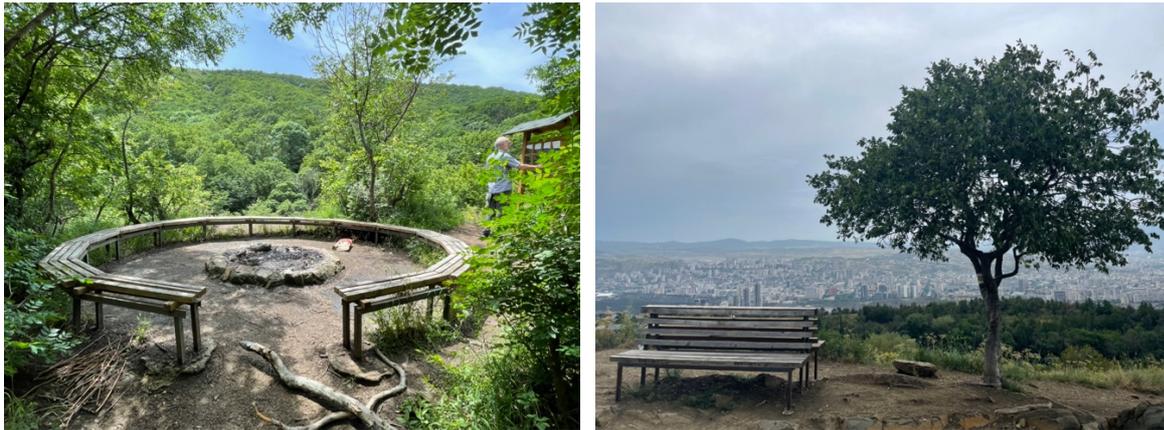


Fig. 12-13: The Tbilisi Urban Forests in the areas of Turtle Lake and Mtatsminda Ridge.

The Babaneuri State Nature Reserve (06/06/2023)

Babaneuri Strict Nature Reserve in Akhmeta Municipality in the Kakheti region is located in eastern part of the Caucasus Mountain along the banks of the Alazani River, spanning elevations from 380 to 1.100 meters above sea level. This protected area, near the villages of Alvani, Babaneuri and Laliskure, as well as the Batsara-Babaneuri Protected Areas, includes a 240 hectares of zelkova (*Zelkova carpinifolia*) groves. The Babaneuri State Nature Reserve was established in 1961.

This nature reserve is the most extensive stand of the Caucasian zelkova, a botanical rarity which was once believed extinct but were rediscovered in 1946 along the Alazani's banks. Zelkova trees can reach heights of 30 meters, with trunk diameters of up to 90 centimeters.

Relevant Forest Ecosystem Services: *biodiversity, natural heritage, education, research.*

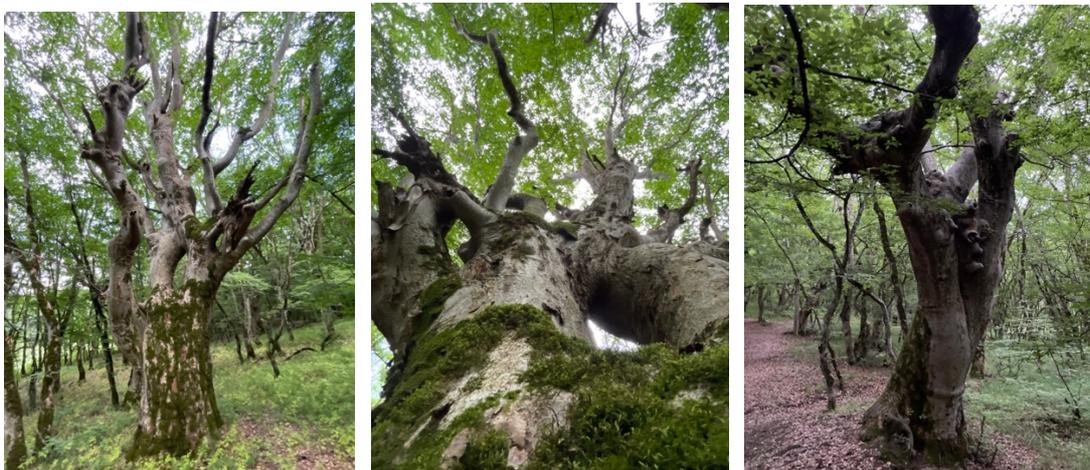


Fig. 14-16: Zelkova tree (*Zelkova carpinifolia*) groves in the Babaneuri State Nature Reserve.

PREPARATORY AND COORDINATION MEETINGS

Two preparatory and coordination meetings were held on May 30, 2023, and June 2, 2023, with the participation of experts from GIZ and the National Forestry Agency.

During these meetings, the following key tasks were accomplished:

- Workshop content and agenda preparation.
- Selection of workshop area - Identifying Akhmeta Forest District as a specific area for discussion and mapping during the workshop.
- Preparation of Maps - creating maps with compartments, borders, special protected areas, topography, and roads.
- Decisions about the participants – whom to invite, and how? Determining the list of invitees, including relevant stakeholders such as government agencies, local communities, NGOs, and experts, to ensure comprehensive participation.
- Field Work by ECO.Georgia Regional Coordinator Lasha Kizmanishvili - providing personalized invitations and information to each participant.
- Map Scale and Print Material Decision.
- Workshop Location Selection - choosing Hotel “Savaneti” in Ikalto as a convenient and well-equipped location accessible to all participants.

These meetings served as important steps in the planning of the upcoming workshop, ensuring that all logistical and content-related aspects were thoroughly addressed.

6.2 Implementation of the Workshop

Implementation of the workshop itself involved presentations, group discussions, participatory mapping exercises, and interactive activities to engage participants.

Date: 05.06.2023

Location: Hotel “Savaneti”, Ikalto

Participants: 23 participants overall at the workshop.

The represented institutions:

- Ministry of Environmental Protection and Agriculture
- National Forestry Agency, central and local level
- Local self-government bodies of Akhmeta Municipality: Town Administration and Municipality Administration
- Protected Areas Administrations
- NGO – Caucasus Environmental NGOs Network (CENN)
- GIZ

Agenda of the Workshop

Time	Topic	Input by
10:00	Registration of the participants	
10.15	Welcome and Opening remarks; Introduction of the format.	Mariam Urdia
10:30	Presentations: <ul style="list-style-type: none"> - Forest Management Planning in Akhmeta: status and outlook - Ecosystem Services Approach 	Dragan Matijasic Robert Hostnik
11:30	Brainstorming session on forest ecosystem services in Akhmeta forest district	All the participants
12:00	Coffee Break	
12:15	Working in groups on participatory mapping of forest ecosystem services of Akhmeta forest district	All the participants
13:30	Lunch Break	
14:30	Presentation of the results of the working groups on participatory mapping of forest ecosystem services of Akhmeta forest district	All the participants
16:00	Coffee Break	
16:15	Collection of feedback on the method of participatory mapping of ecosystem services	All the participants
17:00	Wrap up and closure of the workshop	

Fig. 17: Agenda of the Workshop

Second part: **Brainstorming Session on Forest Ecosystem Services in the Akhmeta Forest District**

During this session, participants were asked to identify and list the most important FES in the Akhmeta forest district. Participants wrote their answers on adhesive notes. Multiple answers were possible. The answers were then translated into English and categorized into four types of forest ecosystem services.

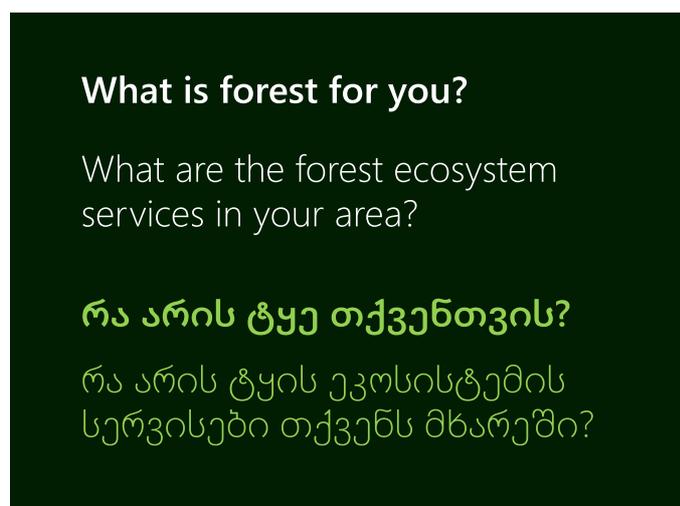


Fig. 21: The general question to the participants in the second part of the workshop

The responses were collected and grouped into categories, resulting in the following ranked order of the most frequently mentioned services:

1. Provisioning Services:

Fuel wood
Clean air
Water
Non timber forest products (berries, mushrooms, medicinal herbs, honey)

2. Regulating Services:

Soil protection
Water purification
Climate regulation

3. Supporting Services:

Biodiversity
Pollination
Natural habitat

4. Cultural Services:

Recreation
Education
Tourism
Cultural heritage



Fig. 22-23: Answers of the participants categorized by types of Forest Ecosystem Services

Third part:
Participatory Mapping of Forest Ecosystem Services in the Akhmeta Forest District

Participants were divided into three groups and tasked with mapping the forest locations where the identified ecosystem functions would be emphasized. In group work, they collaboratively drew these locations on prepared maps.



Fig. 24-26: Group work on mapping of the Forest Ecosystem Services



Fig. 27-29: Results of the mapping of Forest Ecosystem Services by groups

In the subsequent plenary session, each group presented their proposals, and other participants had the opportunity to ask questions and provide feedback.



Fig. 30-32: Results and proposals presentations by groups.

All three groups have prepared high-quality proposals. These proposals shall be thoroughly analyzed, synthesized, and put forth for inclusion in the forest management plan.

7 Other Assignment Activities

During the assignment, the following activities were also conducted:

Meeting at the LEPL Spatial and Urban Development Agency (Tbilisi, 31/05/2023):

The meeting was attended by the agency's director, staff members, and representatives from GIZ and NFA. The topics discussed during the meeting included spatial planning, with a focus on the development of the National Spatial Development Plan. A special emphasis was placed on the significance, planning, and management of urban forests in Georgia.

Field Visit to Krtsanisi Forest Park on the outskirts of Tbilisi (02/06/2023):

This area represents a traditional green recreational area of Tbilisi where the restoration of former forests is currently underway as part of various programs. The project is a part of the state's biodiversity restoration program. It was presented by representatives of the Ministry of Environmental Protection and Agriculture and the National Wildlife Agency.

Participation in the Conference on the Development of Kvareli and Telavi Forest Districts Management Plans (Telavi, 08/06/2023):

The working conference aimed to present the Forest Management Plans of Kvareli and Telavi, share the results of forest inventories conducted, and exchange opinions with representatives of municipalities and other local institutions. The topics also included Forest Ecosystem Services and their integration into Forest Management Plans.

Conducting a Lecture on Urban Forests and Forestry at ILIA University (Tbilisi, 09/09/2023)

Title: "Urban Forests: A Modern Forest Management Challenge. A Case Study from Celje City Forest, Slovenia«

The presentation dealt with the development of the policy, perception and management of the urban forests in Slovenia. Although the country has a high share of forests (58%), the urban forests are most visited forests and with the most emphasized social functions. During the last two decades the concept of the urban forest governance based on close co-operation between the local unit of the Slovenia Forest Service and the municipality of Celje, the third largest city in Slovenia, has evolved. Its results are manifested in the new recreational infrastructure, new areas of public urban forests, long-term oriented and prompt forest management for reasonable costs and established monitoring system.

Together with the traditional forestry knowledge, the urban forest management needs wider approaches, such as participatory planning, education, public relations, communication, branding and innovative instruments for balancing interests in privately owned urban forest areas.

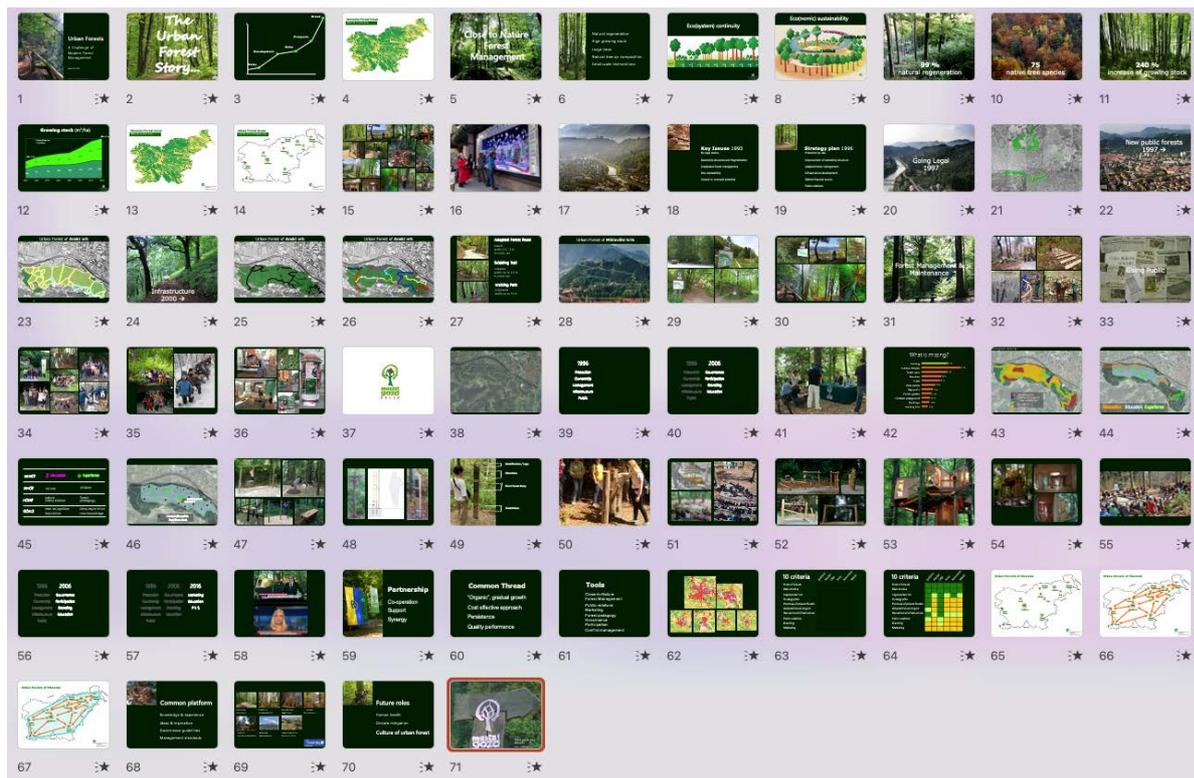


Fig. 33: Presentation slides: »Urban Forests: A Modern Forest Management Challenge (Hostnik 2023b).

The lecture was posted on the YouTube channel Science Club - Institute of Ecology:
<https://www.youtube.com/watch?v=twLXAIP9SPA>

8 Recommendations

- As Georgian forest policy recognizes the importance of integrating Forest Ecosystem Services (FES) into planning for sustainable forest management, particularly considering the significant reliance of local communities on several FES for their livelihoods, we strongly advocate for incorporating a chapter Forest Ecosystem Services into the Forest Management Plans.
- When organizing the workshop for participatory mapping of Forest Ecosystem Services, the identification of relevant stakeholders and the method of engaging them effectively emerged as important factors. Collaborating with local experts proved highly beneficial and, in many cases, essential to ensure meaningful participation.
- In the process of gathering information about FES through participatory means, it is prudent to prioritize services for which stakeholders can provide valuable insights based on their knowledge. Some FES data, such as soil erosion protection, carbon sequestration, or water regulation, may have already been collected and analyzed using more appropriate methods, like forest inventory. Therefore, inclusion in the participatory mapping process may not be necessary.
- Since the information provided during the participatory phase of the workshop was in the Georgian language, a thorough analysis of the responses and proposals documented on the maps is required.
- We recommend that the information collected and analyzed be integrated into the new Forest Management plan for the Akhmeta District.
- During the mapping and plotting of information in the participatory process involving stakeholders, it is vital to tailor the scale of the map bases to match the level of detail in the data collection. This adjustment ensures accurate identification of individual FES locations.
- Regarding the "Ecosystem Services Procedure: Impact Demonstration and Market Tools," which follows the FSC Certification scheme with its comprehensive seven-step procedure, it was found to be highly detailed and precise. However, given the current state of FES development in Georgia, its effective implementation may be premature. Nonetheless, elements of this methodology could prove valuable in subsequent stages of FES evaluation in Georgia.
- The format, agenda, and duration of the workshop for participatory mapping of Forest Ecosystem Services demonstrated success. We recommend its continued use in the future, with the flexibility to make local and content-based adjustments as needed.

9 Conclusions

The assignment within the ECO.Georgia project encompassed several key components related to Forest Ecosystem Services (FES), including contributions to the development of a methodology for assessing FES and assistance in preparing this methodology, involving activities like identification, participatory mapping, and quantification.

Upon reviewing two proposed existing methodologies, it became evident that the ECO KARST methodology guidelines proved highly valuable and well-suited for identifying, mapping, and evaluating forest ecosystem services. This methodology provided essential insights and guidance during the preparation and execution of the workshop on participatory mapping of Forest Ecosystem Services.

Conversely, the methodology known as the Ecosystem Services Procedure: Impact Demonstration and Market Tools, which follows the guidelines of the FSC Certification scheme and employs a seven-step procedure, appeared to be quite demanding, especially considering the current state of FES development in Georgia. It may find more relevance in later stages of FES evaluation in Georgia.

The legal framework for the development of forest ecosystem services in Georgia is primarily based on the country's constitution and various policy documents, laws, and regulations. In recent years, Georgia has made significant efforts to transition from unsustainable forest management practices toward more sustainable and conservation-oriented approaches. The Forest Code of Georgia, alongside other policy documents, provides a robust legal foundation, covering all essential aspects necessary for the development of Forest Ecosystem Services. An important issue regarding FES development is, that Forest Code defines entering and freely moving around in forest.

The overview of the current status and development of Forest Ecosystem Services in Georgia underscores the importance of integrating FES into planning, as emphasized by forest policy. It also highlights the strong dependence of local communities on several Forest Ecosystem Services and their significance for livelihoods, environmental well-being, and economic activities.

The workshop's execution involved various components such as presentations, group discussions, participatory mapping exercises, and interactive activities to engage participants. The preparation and successful implementation of the workshop stood as a primary task and goal of this assignment. It was carried out following extensive preparatory work, which entailed assessing the state of FES development in Georgia, adapting selected methodologies, and collaborating closely with colleagues from GIZ and NFA during creative working meetings.

Key stakeholders actively participated in the workshop, demonstrating high levels of engagement, content delivery, and open cooperation. The information gathered regarding FES identification, mapping, and evaluation proved valuable and practical. After thorough analysis, it will be essential to incorporate these findings properly into the new Forest Management Plan for Akhmeta District. In summary, the workshop achieved success and can serve as a model for planning future workshops of this nature.

Considering the relatively brief three-week timeline, which included two weeks in the field in Georgia and one week for preparation and reporting, this assignment made a useful contribution to the ongoing development of a structured and comprehensive approach to assess forest ecosystem services in Georgia through participatory methods.

10 References

ECO Karst, Interreg Danube. 2019. Mapping of ecosystem services at regional level. A practical guide. 167 p. <https://www.interreg-danube.eu/approved-projects/eco-karst/outputs?page=2> (19.05.2023)

FSC Certification document. 2021. Ecosystem Service Procedure - Impact Demonstration and Market Tools”, FSC-PRO-30-006 V1-2 EN, Forest Stewardship Council, Bonn. 66 p. <https://ic.fsc.org> (25.5.2023)

Hostnik R. 2023. Ecosystem Services: The Bridging Concept – presentation at the Workshop on Participatory Mapping of Forest Ecosystem Services, Akhmeta 5/6/2023.

Hostnik R. 2023b. Urban Forests: A Modern Forest Management Challenge. A Case Study from Celje City Forest, Slovenia. Lecture on Urban Forests and Forestry at ILIA University Tbilisi, 09/09/2023 <https://www.youtube.com/watch?v=twLXAIP9SPA>

Kavtarishvili M. 2022. Report of the project “Identification of Forest Ecosystem Services (FES) and Beneficiaries of FES”

Millennium Ecosystem Assessment (2005). Ecosystems and Human Well Being: Synthesis. Island Press, Washington DC.

TEEB (2010), The Economics of Ecosystems and Biodiversity. Ecological and Economic Foundations. Edited by Pushpam Kumar. Earthscan, London and Washington

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