



# The Guideline for Cost-Benefit Analysis

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

**Final Report**  
**PMO Consulting**  
**28 May, 2024**



**Published by**

PMO Consulting

**Registered offices**

Bonn and Eschborn, Germany

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

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This publication has been prepared by the **PMO Consulting**, in the frame of the ECO.Georgia project implemented by Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH on behalf of the German Federal Ministry for Economic Cooperation and Development (BMZ).

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## List of Abbreviations

TPL	Tusheti Protected Landscape
LEPL	Legal Entity under Public Law
CBA	Cost-Benefit Analysis
CBD	Convention on Biological Diversity
ENPV	Economic Net Present Value
FAO	Food and Agriculture Organization
IUCN	International Union for Conservation of Nature
MCA	Multi-Criteria Analysis
MFM	Municipal Forest Management
NPV	Net Present Value
UNFCCC	United Nations Framework Convention on Climate Change
UNFF	United Nations Forum on Forests

## Executive Summary

The provided guide is a component of the ECO.Georgia project's third phase, which focuses on empowering local authorities and citizens to participate in sustainable forest management practices. ECO.Georgia is a collaborative effort between the Green Climate Fund (GCF), the German Federal Government, the Swiss Confederation, and the Georgian Government to implement forest sector reforms. The project's primary objectives are to reduce forest degradation emissions through sustainable forest management and promote energy efficiency and alternative fuels to lessen fuelwood consumption, a significant factor in forest degradation.

Component 3 specifically addresses the development of cost-benefit analysis guidelines. These guidelines aim to inform decision-making processes at the municipal level regarding engagement in Municipal Forest Management (MFM). Municipal authorities and their staff will gain valuable knowledge that facilitates well-reasoned and informed decision-making, receive standard operating procedures for forest planning and management, and benefit from increased opportunities for public participation. The cost-benefit analysis guidelines function as a decision-making tool for municipal stakeholders, enabling them to assess the feasibility and attractiveness of assuming forest management rights and responsibilities. These guidelines provide a comprehensive framework for evaluating the economic, ecological, and social impacts of forest management at the municipal level.

The presented guidelines for cost-benefit analysis in municipal forest management provide comprehensive instructions for conducting such analyses in eight target municipalities: Ozurgeti, Chokhatauri, Lanchkhuti, Tianeti, Akhmeta, Telavi, Kvareli, and Dedoplistskaro. This guide outlines all the steps involved in conducting the analysis, categorizes costs and benefits, and details methods for their calculation, all while considering the local context and legal framework. The report further delves into the assessment of non-monetizable costs and benefits through the application of a multi-criteria analysis (MCA) tool. It's crucial to highlight that this manual functions solely as a set of instructions and does not encompass municipality-specific calculations. These calculations remain the responsibility of individual municipalities at the local level.

# 1 Introduction

## 1.1 Notion and Definition of Cost-Benefit Analysis

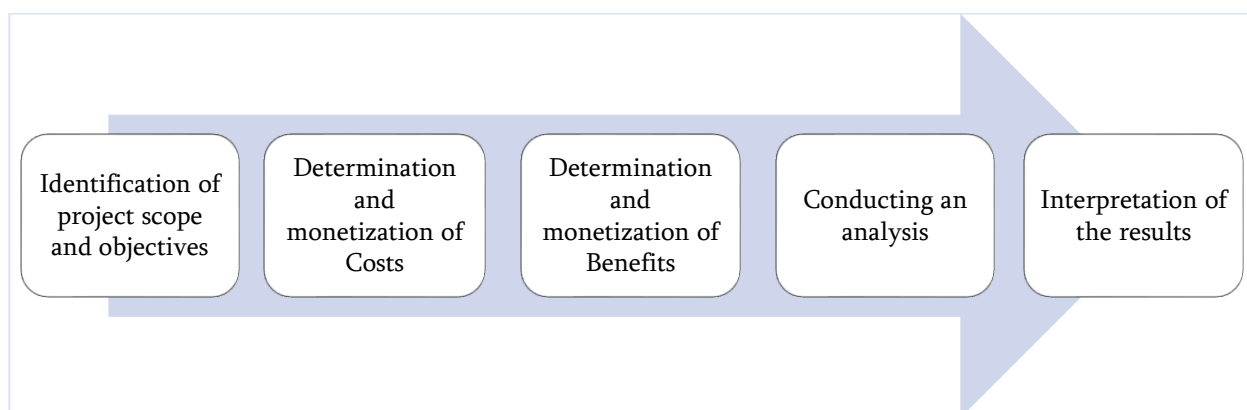
**Cost-Benefit Analysis (CBA)** is an assessment framework that systematically compares the expected costs of a project or policy to its benefits, expressed in monetary units. This is a quantitative assessment of the expected project costs and expected benefits in monetary value **based on the assessment**<sup>1</sup> of the alternative value.

The essence of the CBA lies in its ability to provide a quantitative basis for decision-making that will help to assess whether the benefits of a particular action outweigh its costs and to what extent (Boardman et al., 2018). A similar approach allows policy makers and stakeholders to make informed decisions. This analysis allows for the effective use of resources in order to ensure the economic feasibility and alternative options of the project Ability to evaluate. The direct and indirect costs and benefits associated with a project or a particular change are depicted in the monetary value during cost-benefit analysis, in addition, their **net current value is also calculated**<sup>2</sup>. During cost-benefit analysis, the impact of the project is compared with the alternative to "doing nothing".

In many models, cost-benefit analysis also determines the alternative cost of the project in the decision-making process. Alternative value is the potential benefit to the realization of the other, second-best alternative, which was not realized because the decision-makers made a different choice. In other words, an alternative value is an opportunity lost or missed by a choice or decision, a benefit. Identifying alternative costs allows project stakeholders to assess the benefits not only for current choices, but also for other alternatives. Given all the options and potential opportunities missing, cost-benefit analysis is more thorough and allows for better decision-making.

It should be noted that there is not one commonly accepted method for carrying out cost-benefit analysis. However, all processes usually have some variations of the following five steps: identifying the scope and goals of the project, determining costs, determining the benefits, conducting analysis, interpreting the results obtained and developing recommendations (see Figure 1). Below is an overview of the content of each stage:

*Figure 1: General steps to implement the cost-benefit analysis process*



### 1. Identification of project scope and objectives

The initial stage includes understanding the situation, defining goals and creating an analysis framework. It includes project planning, identifying stakeholders and consulting with them and identifying the

1 Alternative costs (cost) - (opportunity cost) - the expenditure (cost) of missed opportunities, alternative costs of goods and services that must be deducted for the production or purchase of a given goods and services. Alternative value is the potential benefit to the realization of the other, second-best alternative, which was not realized because the decision-makers made a different choice.

2 Discounted (current period) value of the sum of expected future cash flows (positive and negative) during the project life cycle; The definition of these terms is given in the subsequent subsection.



necessary assessment techniques. At this stage, the project is planned, including deadlines, necessary resources, restrictions, necessary personnel or alternative assessment techniques.

## 2. *Determination and monetization of Costs*

The stage of cost determination and monetization in the economic CBA perspective is crucial. This process includes comprehensive identification and quantitative determination (monetization) of all costs related to a project or decision. It is important that some of the costs are quantitatively (physically) assessed at first and then transferred to monetary value.<sup>3</sup> From an economic point of view, this covers a wide range of costs, especially economic, ecological (environmental) and social dimensions.

- **Economic costs:** These are the direct financial costs required for the implementation and operation of the project. They include the costs of labor, materials, equipment and other resources that are directly involved in the project. Economic costs also include alternative costs. Monetization of these costs is often simple due to the presence of available quantitative indicators, but the challenge often lies in the future possible costs precisely in prediction.
- **Ecological (environmental) costs:** The environmental dimension of costs is critical, especially in projects with significant interactions with natural ecosystems. These costs include potential degradation of ecosystems, biodiversity loss, pollution and other negative impacts on natural resources. Monetization of environmental costs can be difficult because it requires granting monetary value to aspects of the environment that are not normally for sale in markets. To estimate these costs, techniques such as conditional assessment or recovery cost can be used, as well as metanalysis of various existing papers and resources<sup>45</sup> and adjusting the environmental costs assessed based on the experience of other countries to the local context.
- **Social Costs:** Social costs reflect the project's impact on the well-being of individuals and communities. This may include community disruptions, impacts on public health, changes in social cohesion, and other effects that may change the social structure. Like environmental costs, quantitative assessment of social expenditure is difficult from a monetary point of view. However, it can be used to assess the monetary value of social impact Methods such as payment readiness<sup>6</sup> assessment, hedonic pricing,<sup>7</sup> etc.

In economic and social dimensions, it is possible to consider the gender aspect. A number of international framework-treaties "On rural women, they focus on the significant contribution of women and highlight the role they play in ensuring the economic well-being of families, including in non-commodity fields, with the responsibility of ensuring the equal participation and accessibility of rural women and men to various resources. Unfortunately, we face cases of expulsion and invisibility of women in sectors such as forestry, energy, transport, construction and infrastructure, where gender-based data is usually not collected. The link between gender equality and forests can have a significant impact on the success and sustainability of environmental initiatives." The importance of gender roles in forest management in the sub-chapters discussed below. (საკონსულტაციო კომპანია DEPA Consulting, 2024)

We should consider this section Negative external effects ("externals")<sup>8</sup>, or unforeseen expense for third

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<sup>3</sup> e.g., During the construction of the HPP, how many m3 of forest will be cut down, we must first know their physical volume and then convert it into monetary value.

<sup>4</sup> A statistical technique that aims to determine the overall difference between groups by combining information obtained from several studies. In other words, obtaining and combining information from already conducted surveys, papers.

<sup>5</sup> Sometimes they use TEEB techniques - "Economies of Ecosystems and Biodiversity". This is a global initiative launched in 2007 by the United Nations Environment Programme (UNEP), which aims to assess the economic value of biodiversity, ecosystems and services they provide to the public.

<sup>6</sup> Readiness for payment (WTP) is a concept used to determine the maximum amount for which an individual is willing to spend to buy goods or services or to avoid anything undesirable. It is a fundamental measure in economics and market research that helps us understand the perception of consumer value and demand for a product or service at different price points. WTP is especially useful in situations where market prices are not available or when evaluating non-market goods such as environmental benefits, public goods or intangible assets.

<sup>7</sup> Hedonic pricing is an economic assessment method used to estimate the value of goods or services by dividing it into component attributes and determining the contribution of each attribute into the total price. For example, in the context of environmental economics and real estate, hedonic prices are often used to assess the impact of various factors on property values, such as environmental quality, location, and other amenities or uncomfortable contenders.

<sup>8</sup> The external effect is the effect of the action of one person on the economic condition of the other person. If this influence is unprofitable for the second person, such an effect is called a negative external effect. An example of a negative external effect is a plant, the exhaust or production waste of which pollutes nature and has a detrimental effect on human health.

parties. For example, industrial pollution caused by the project, etc. (Pearce, Atkinson, & Mourato, 2006) The process of determining and monetizing costs is a comprehensive assessment that requires interdisciplinary expertise. Economists, environmental scientists, and social researchers often collaborate to ensure that all relevant costs are identified and properly evaluated. This holistic approach ensures that the economic CBA takes into account the full range of project-related costs, providing a solid basis for comparing the expected benefits.

### **3. Determination and monetization of Benefits**

The stage of determination and monetization of benefits involves identifying all the positive outcomes associated with the project and converting them into monetary values, which includes a wide range of benefits according to economic, environmental and social dimensions.

- Economic benefits: Direct financial profit from a project such as increased revenues and cost savings is the primary economic benefit. These benefits also apply to creating indirect advantages, such as creating jobs and increasing market competitiveness (Boardman et al., 2018). Monetization of these benefits requires the valuation of the additional value generated by the project using methods such as analyzing future cash flows.
- Environmental Benefits: Projects can lead to significant positive environmental impacts, including habitat recovery and pollution reduction. Assigning monetary values for this benefit often includes methods such as the method of transferring benefits<sup>9</sup> or assessing the cost of avoiding environmental damage. These approaches help to quantify the substantial value of natural assets and ecosystem services maintained or improved by the project.(Tietenberg & Lewis, 2016)
- Social Benefits: Improving public well-being and quality of life represent crucial social benefits. This includes improving health, educational advancement and increased social participation, and more. Monetization of such benefits may include techniques such as conditional valuation<sup>10</sup>, which assesses individuals' willingness to pay for non-market benefits (Hanley, Shogren, & White, 2007).

As above, in the expenditure section, the economic and social dimensions can also be considered the gender aspect. Also, in this section we need to consider **Positive external factors (“Externals”)**<sup>11</sup>, or unforeseen benefits for third parties. For example, an environmental restoration project can increase the cost of local property and the attractiveness of the community living there, which will benefit those directly involved in the project (Pearce, Atkinson, & Mourato, 2006).

### **4. Conducting an analysis**

After identifying and determining all costs and benefits, an analysis is carried out, for which it is important to **determine the period of time** we are interested in evaluating the project or decision. This section shall assess how the flow of costs and benefits is distributed over the selected time period and then the discounting of the sum of the expected future cash flows (positive and negative) during the project lifecycle, i.e., the present / current Transfer to value. If the total benefit in the current cost is higher than the costs, then the project brings a net benefit to the project.

When conducting an analysis, it is also important to highlight the issue of gender roles if the data allows it. The importance of gender roles in forest management is increasingly recognized as crucial to strengthening sustainability and fair benefits in this sector. Gender roles play an important but often overlooked role in forest management, which affects various aspects of decision-making, the use of resources and, ultimately, the cost-benefit consequences of forest management initiatives. Gender roles have led to a clear division of labor in forest management activities. Men are usually associated with activities such as timber mining and heavy machinery work, while women were more involved in

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<sup>9</sup> The benefit transfer method is an economic tool used to assess the value of ecosystem services and environmental goods by transferring information from already completed studies in one place or context to another similar situation where such data does not exist. This method is especially useful when conducting a full economic assessment study is very expensive, time-consuming, or when data availability is limited.

<sup>10</sup> English contingent valuation

<sup>11</sup> The external effect is the effect of the action of one person on the economic condition of the other person. If this influence is beneficial for the second person, such an effect is called a positive external effect. An example of a positive external effect is the restoration of historic buildings and buildings, which leads to both the growth of tourism and the pleasure of the local population.

activities such as collecting non-wood forest products, nursery care and household resource management. Such an approach to partition of labor can affect the effectiveness of forest management practices, as it is determined who has access to certain resources and experience. This section is discussed in more detail in subsection 1.3 below.

Ordinance No 65 of 16 February 2023 of the Government of Georgia defines the following terms related to the analysis:<sup>12</sup>

- Net current value (NPV – Net Present Value) – discounted value of the sum of future cash flows (positive and negative) expected during the project lifecycle;
- ENPV (Economic Net Current Value) – discounted value of the sum of future cash flows, including economic benefits and expenditures, during the project's lifecycle;
- Benefit cost ratio – the ratio of total discounted benefits to total discounted costs during the entire period of the life expectancy of the project;
- Alternative cost – the cost of the resource in case of using the best alternative option. The alternative value of the purchased resource of a project during economic analysis is its marginal social value in the case of the best alternative use (which is not related to the project) or in the case of current use (measured on the basis of payment readiness) if it is a final product or service (including the benefits accrued on government deposits);
- External factors (Externalities) – expenses or benefits that are not directly accumulated on the accounts of the entity implementing the project (i.e., it cannot be reflected in financial reports because it has no market price) and/or which cannot be directly related to the project in terms of financial flows. It can be positive or negative;
- Discounting – a process in which future benefits and nominal indicators of costs to be incurred are depicted in the current value, the "discounting rate" is a similar annual rate of a negative interest rate that reduces future costs and benefits to determine comparable current values.

## ***5. Interpreting the results and preparing recommendations***

The final step involves synthesizing conclusions, summarizing costs and benefits, and preparing a recommendation based on analysis, taking into account the gender aspects. This includes taking into account resource constraints that may require mutually exclusive decisions to be made among several positive options.

It should be noted that the CBA also has gargantuan restrictions. While cost-benefit analysis is effective for small and medium-sized projects, it may not fully capture the complexities of larger, longer-term projects, where, for example, factors such as inflation and interest rates have a significant impact on financial forecasts. Moreover, relying on forecasted data, such as future revenues and expenditures, leads to uncertainty and certain inaccuracies.

Despite the above, CBA remains one of the basis for decision-making based on data where all recommended results are based on quantitative data tailored to a particular issue. This methodological approach requires comprehensive research across the cost spectrum, which requires understanding both predictable and unpredictable costs as well as the content and characteristics of these costs. Such a thorough analysis not only strengthens the findings, but also strengthens the support of strategic planning initiatives by providing a more robust basis based on predictive analysis of project results.

## 1.2 The Importance of Informed Decision-making and the Role of CBA to Ensure Sustainable Forest Management Practices

The informed decision-making process is fundamental in different sectors and disciplines, the cost-benefit tool plays a crucial role in facilitating these decisions. The CBA offers a structured approach to evaluating the results of potential actions by systematically comparing the costs and benefits associated with each option. This methodology provides the basis that decisions are not based solely on intuitive judgments or partial assessments, but are based on a comprehensive assessment of their economic, environmental and social impacts.

In its essence, CBA aims to quantitatively determine the pros and cons of different choices in the overall dimension, usually in monetary value, in order to make a direct comparison of them. The CBA also envisions attempts to assign value to more intangible elements such as environmental impact and social welfare. In doing so, CBA provides a clear, transparent framework to assess the relative advantages of different decisions that make it an invaluable tool for policy makers, business leaders and other decision-makers.

The use of CBA goes beyond simple calculations of costs and revenues and includes the principles of discounting future values based on the impact of decision distribution. A broad perspective like this is important to understand the long-term consequences of decisions and ensure that they are consistent with the Sustainable Development Goals and social, including gender equality.

In addition, the use of CBA in the decision-making process enhances accountability and transparency. By establishing a justification for structured, quantitatively defined choices, the CBA promotes trust between stakeholders and ensures the protection and justification of decisions. Transparency is especially important in public sector decisions, where accountability to citizens and stakeholders is paramount.

**The importance of the CBA instrument is evident in the legislative acts and resolutions of Georgia.** According to Resolution No 65 of 16 February 2023 of the Government of Georgia, CBA is an important part of the methodology and evaluation instrument for managing investment/capital projects. "The aim of the development of the investment / capital project management methodology is to introduce a unified investment and capital project management cycle to help budgetary organizations to consistently and fully assess investment/capital investments and to determine the priority of competing projects, which ensures that in the process of strategic planning and budget preparation, both throughout the country and in the sectoral directions, in the management of investment/capital projects. Transparency, strengthening accountability and effective use of state resources."<sup>13</sup>

In addition to the said Ordinance, the importance of the CBA is highlighted in Resolution No 35 of 17 January 2020 of the Government of Georgia, which deals with the approval of the RIA methodology<sup>14</sup>. According to the ordinance, the procedure and conditions for the implementation of RIA were determined for the legislative initiatives for which the said analysis was mandatory, and the CBA shall consider it as one of the tools for quantitative and qualitative analysis of the impacts.

The concept of CBA can be considered an important part of forest management, especially at the municipal level, where the impact of forest-related decisions is directly felt by local communities. CBA offers a methodical approach to evaluating the various outcomes of forest management initiatives, the benefits received by comparing costs to ensure the economic efficiency and sustainability of decision-making processes (Boardman et al., 2018). This is especially important in municipal forest management, where the multifaceted role of forests - from biodiversity conservation to livelihood provision - requires a balanced approach that takes into account Both ecological and socio-economic dimensions.

Moreover, the importance of CBA goes beyond simple economic considerations and covers social and environmental aspects, thereby consistent with the principles of sustainable forest management that support the protection of the comprehensive well-being of ecosystems and dependent communities (Boardman et

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<sup>13</sup> Ordinance No 65 of the Government of Georgia; February 16, 2023; Investment/Capital On the approval of the project management methodology; [matsne.gov.ge](https://matsne.gov.ge)

<sup>14</sup> Ordinance No 35 of the Government of Georgia; January 17, 2020; On the Approval of RIA Methodology for RIA; [matsne.gov.ge/1](https://matsne.gov.ge/1)

al., 2018). Thus, the integration of CBA into municipal forest management (MFM) is not only a matter of economic prudence, but an ethical imperative for future generations of natural resources. For responsible driving.

In the context of forest management, CBA becomes an indispensable tool for assessing the viability and sustainability of forest-related projects and policies. Given the multifunctional nature of forests, which includes ecological, economic, and social dimensions, CBA helps us to capture the full range of costs and benefits associated with forest management solutions. For example, an economic assessment of ecosystem services provided by forests, such as biodiversity conservation, can be included in the CBA framework to take into account these important benefits in the decision-making process.

CBA integration and gender perspective provide a solid foundation for the development of comprehensive training modules and guidelines in municipal forest management. These tools are designed to empower all stakeholders, including local government officials, community leaders and residents, with the knowledge and skills needed to effectively participate in forest management decisions. This participatory approach not only strengthens the legitimacy and adoption of forest management policies, but also contributes to the development of more sustainable and adaptive management practices that better fit local conditions and needs. In addition, the mentioned paper shows that gender is important in forest management, and the results of the analysis show that where more women were involved in forest management, the forests were overall in a better position and there was a significant improvement in the direction of its protection. The paper shows that the timeless participation of women in forest management leads to better conservation and regeneration of common resources. (Agarwal, 2009)

### **1.3 The Importance of Gender Roles in Forest Management and their Impact on Cost-benefit Outcomes**

The importance of gender roles in forest management is increasingly recognized as crucial to strengthening sustainability and fair benefits in this sector. International standards and practices emphasized the role of gender integration not only as a fairness but also as a strategic approach to improving environmental, economic and social implications in forest conservation and management. As forests play a crucial role in mitigating the impacts of climate change, preserving biodiversity and livelihoods, the inclusion of gender perspectives in forest management can lead to more comprehensive and successful strategies.

International standards and guidelines for promoting gender equality in forest management are developed by various international organizations working on sustainable development, environmental protection and gender equality. In this direction, it is possible to allocate the following documents and organizations:

1. **The UN Framework Convention on Climate Change (UNFCCC)<sup>15</sup>:** The Convention recognizes the gender dimensions of climate change and encourages gender approaches in climate change mitigation and adaptation strategies, including forests and REDD+ (reducing forest deforestation and forest degradation emissions).
2. **The Convention on Biodiversity (CBD)<sup>16</sup>:** The Convention highlights the importance of gender equality in preserving biodiversity and the sustainable use of natural resources, including forests. She calls for the integration of gender considerations into national biodiversity strategies and action plans to ensure full and equal participation of women and men in conservation efforts.
3. **The United Nations Forest Forum (UNFF)<sup>17</sup>:** The forum was founded in 2000 and aims to promote sustainable forest management at a global level. She recognizes the importance of integrating gender opinions into forestry policies and programmes to achieve the Sustainable Development Goals. UNFF urges member states to adopt gender responsibility approaches in their national forest management plans.
4. **Food and Agriculture Organization (FAO)<sup>18</sup>:** FAO has developed various guidelines and tools to promote gender equality in forestry, such as the FAO Forestry Gender Toolkit. These resources

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<sup>15</sup> [United Nations Framework Convention on Climate Change](#)

<sup>16</sup> [Convention on Biological Diversity](#)

<sup>17</sup> [United Nations Forum on Forests](#)

<sup>18</sup> [Food and Agriculture Organization](#)

are a practical guide for decision-makers and forest managers to integrate gender perspectives into forest management policies, programmes and projects.

5. **The International Union for Conservation of Nature (IUCN)<sup>19</sup>:** IUCN promotes gender responsibility approaches to forest conservation and management through its programmes. The Union provides technical support and capacity building and capacity building in forest-related initiatives to promote gender equality.
6. **Equator Principles<sup>20</sup>:** Although not specifically focused on forest management, the equator principles are environmental and social risk management guidelines adopted by financial institutions in the financing of projects, including the determination, assessment and evaluation of environmental and social risks related to forestry projects. For driving.

In addition, the EU actively supports gender equality and integration of gender perspectives into various policy areas, including environmental and forestry policy. The EU's commitment to gender equality is strengthened in various legal instruments, such as the EU Treaty/Lisbon Treaty (TFEU) and the EU Charter of Fundamental Rights. In addition, the EU has adopted directives and regulations aimed at promoting gender equality in employment, education and other areas of public life.

These international standards and guidelines are guidelines for promoting gender equality in forest management, women's participation and sustainable development. They demand the integration of gender opinions into forestry policies, programmes and projects to ensure more inclusive and equitable outcomes. International good practices for gender equality in forest management involve ensuring equal participation, representation and benefits for both men and women throughout the forestry sector. The basic principle and strategy include the following issues:

- **Politics and legislation** – First of all, gender inequality must be resolved at the level of politics and legislation. This means that Gender's perspectives are integrated into the national politics of the state's forestry, legislation and regulations.
- **Inclusive participation** – It is important to encourage and promote equal participation in the decision-making process related to forest management. More specifically, this principle implies the ability of women to participate in community forest groups, forest consumer organizations, and other decision-making bodies.
- **Capacity Building** – Providing training and capacity building programs aimed at both men and women to strengthen their knowledge and skills in sustainable forest management practices. This may include technical training, leadership development, entrepreneurship skills, and more.
- **Collecting gender-disruptive data – collection and analysis of data on** forest resources, forest users and their livelihoods in a gender-divided form. This helps to understand the specific roles, needs and priorities of men and women regarding forest management.
- **Women's property rights** – Advocacy and protection of women's rights on access, control and ownership of land and forest resources. This includes legal and practical barriers that limit women's right to property on land and forest resources.
- **Forest management practices** – development and promotion of forest management practices that take into account the different needs, preferences and restrictions of men and women. This includes facilitating agroforestry systems, managing non-wood forest products (NTFPs), and value-added recycling activities available for both men and women.
- **Economic empowerment** – Creating opportunities for women in income-generating activities related to forest resources, such as sustainable harvesting, recycling and marketing of forest products. This includes access to credit, markets and other ancillary services.
- **Monitoring and evaluation of gender responsibility** – Inclusion of gender indicators in monitoring and assessment systems to ensure gender equality in forest management. This helps to identify gaps and challenges and tailor relevant strategies.

Gender roles play an important but often overlooked role in forest management, which affects various aspects of decision-making, the use of resources and, ultimately, the cost-benefit consequences of forest management initiatives.

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<sup>19</sup> [International Union for Conservation of Nature](#)

<sup>20</sup> [The Equator Principles](#)

Gender roles have led to a clear division of labor in forest management activities. Men are usually associated with activities such as timber extraction and heavy machinery work, while women were more involved in activities such as collecting non-wood forest products, nursery care and household resource management. Such an approach to division of labor can affect the effectiveness of forest management practices, as it is determined who has access to certain resources and experience.

Gender roles often determine who possesses specific knowledge and experience regarding forest management. For example, women may have valuable, traditional knowledge of medicinal plants, sustainable crop practices, and biodiversity conservation. Ignoring or marginalizing this knowledge can lead to in optimal forest management policy strategies and missed opportunities for the use of sustainable resources.

Gender roles can also define decision-making processes in forest management institutions and communities. In the main cases, men occupy official and power positions, which affects the formation and implementation of policies. The exclusion of women in the decision-making process can lead to neglect of their perspectives, priorities and needs, which will lead to less inclusive and fair forest management.

In major cases, women in many societies have limited access to land ownership and possession, which limits their participation in forest management activities. Unequal access to resources can hinder women's ability to engage in forest-related income-generating activities that will lead to gender inequality in income and well-being.

Gender roles influence social dynamics and community unity in forest-dependent communities. In cases where women are excluded from decision-making processes or economic opportunities, this can lead to tensions and conflicts in communities. In contrast, women's empowerment can support more sustainable and bound communities to increase the effectiveness of forest management initiatives.

The impact of gender roles on cost-benefit outcomes in forest management is multifaceted. Integrating gender considerations into forest management can lead to more sustainable and equitable results using diverse knowledge, promoting social inclusion and increasing the sustainability of forest ecosystems. Gender inequality is the cause of missed economic opportunities, increased costs and negative social consequences.

### **Impact of gender roles on cost-benefit outcomes**

The impact of gender roles on cost-benefit outcomes can be discussed in different contexts. First of all, it is worth noting the issue of gender inequality in the labor market, which affects the economic productivity of society. If women are limited in participation in the labor market and are engaged only in domestic responsibilities, this can lead to potential economic losses.

Depending on gender roles, in many cases men dominate certain societal areas, which is a kind of professional segregation that can affect economic efficiency.

Gender inequality in the field of entrepreneurship and business also has a huge impact on cost-benefit outcomes. The scarce financial opportunities of women to start a business led to the loss of diverse entrepreneurship and a slowdown in economic growth.

Interpretation of the results of cost-benefit scenarios from a gender perspective in municipal forest management involves an analysis of how different scenarios affect resources, employment opportunities and decision-making rights for women and men.

- *In terms of access to resources*, in the case of gender inequality, when women have limited access to forest resources, this can lead to severe economic consequences. And in cases where women have equal access to forest and land resources, we gain economic growth, poverty reduction, and the establishment of sustainable forest management practices.
- *In terms of employment*, when women are mainly engaged in the collection of non-wood forest products and agricultural activities related to forest management, gender inequality increases and affects economic outcomes.

When decision-making powers are mainly concentrated in the hands of men and women are distancing themselves from forest management processes, which limits their ability to influence policies and management practices. This is the result of an unequal policy that ignores the needs and priorities of women, which will lead to less effective and sustainable forest management outcomes. To promote more inclusive forest management processes, it is important to take into account various perspectives and priorities, including the involvement of women in decision-making.

As part of the research, several European countries have been identified that have implemented initiatives to eliminate gender inequality. Among them, Sweden is worth noting, which is at the forefront of promoting gender equality in forestry. The country has implemented a gender mainstreaming policy in the forestry sector and is actively promoting women's participation in forest-related professions and decision-making processes.

Finland has recognized the importance of gender equality in sustainable forest management and has taken steps to promote women's participation in forestry. Initiatives include training programs, mentorship opportunities, and efforts to increase women's representation in forestry organizations.

Norway has introduced gender-sensitive approaches to forest management, including initiatives to increase women's participation in decision-making and ensure equal access to forest resources. The government also supported the gender dimensions of forestry and natural resource management.

Germany has incorporated gender considerations into its forestry policies and programs, focusing on promoting women's participation in forest management and ensuring a gender-responsive approach to forestry practices. Efforts have been made to address gender disparities in access to forest resources and opportunities in rural areas.

Austria has implemented gender mainstreaming strategies in forestry and natural resource management. These include initiatives to increase women's representation in forestry organizations and decision-making bodies. The government also supports research and awareness raising on gender issues in forestry.

These countries showcase various strategies for promoting gender equality in accessing forest resources. These strategies include policies, programs, and initiatives aimed at enhancing women's participation and eliminating gender inequality in forestry. Each country's approach may be shaped by its context, cultural norms, and governance structures.

## 1.4 Objectives and Content of the Publication

The presented manual for cost-benefit analysis for municipal forest management serves to provide comprehensive instructions for the development of eight target municipalities – **Ozurgeti, Chokhatauri, Lanchkhuti, Tianeti, Akhmeta, Telavi, Kvareli and Dedoplistskaro municipalities** - to conduct cost-benefit analysis in local/municipal forest management.

Based on the report prepared by GEO "Forest Management Capacity Analysis According to 8 Target Municipalities", which was prepared based on the report prepared by the German Society for International Cooperation (GIZ) project "Supporting the Implementation of Forest Sector Reform in Georgia (ECO, Georgia)" within the third component and funded by the Swiss Society for Development and Cooperation (SDC), municipal forests are in a very early phase in Georgia. Today, we have only two practical examples in terms of municipal governance in Georgia. one in Akhmeta municipality, which has already gained a lot of experience and the other in Gori municipality, (Kavtarishvili, 2023) which is relatively new. These practices differ slightly.



The guide presented is Project ECO. Part of Georgia Component 3. ECO. Georgia is co-funded by the Green Climate Fund (GCF), the Government of the Federal Republic of Germany, the Government of the Swiss Confederation and the Government of Georgia to implement forestry sector reform. The project aims to reduce forest degradation emissions through sustainable forest management, as well as to promote energy efficiency and alternative fuels to reduce fuel consumption as the main contributing factor to forest degradation.

Component 3 - Livelihood Opportunities and Local Self-Government in Forest Management - serves to develop the capacity of local authorities and citizens to participate in sustainable forest management. In doing so, communities in the target regions will be able to benefit from diversified income opportunities by improving the value chains of forestry and better access to forestry knowledge and skills.

Under Component 3, the development of cost-benefit analysis instructions serves to make an informed decision about inclusion in MFM. Municipal authorities and their staff are equipped with knowledge that facilitates an argumentative and informed decision-making process, standard operational procedures for forest planning and management, as well as increased opportunities for public participation. Cost-benefit analysis instructions will be a decision-making tool for municipal stakeholders to determine whether it is reasonable and attractive for a municipality to take on forest management rights and obligations.

## 2 Existing Context Review

### 2.1 Existing Local/Municipal Forest Management Practices; Brief Overview of the Situation

Forest Code of Georgia<sup>21</sup> It envisages the management of forests by municipalities, although the majority of municipalities need strengthening in the following areas for forest management: strategic approach, practical tools, economic and technical planning, awareness, professional skills and opportunities to actively engage in sustainable forest management. Today, municipal forest management practices are only in two, Akhmeta and Gori municipalities, Found. Nowadays, municipalities can have municipal forests in municipal territories, and according to the Forest Code, by 2030, the criteria for determining "forest of local importance" and the procedure for transferring forest of local importance to a municipality shall be developed and approved. The forests to be transferred to the municipality may also include the forests that are currently managed by the LEPL National Forest Agency. (Kavtarishvili, 2023)

The Forest Code of Georgia regulates legal issues related to forest management. According to the abovementioned, the forest of Georgia shall be managed on the basis of a system established in accordance with the principles of sustainable development, which ensures the improvement of the quantitative and qualitative indicators of forest, the protection of its biodiversity, the rational use of its economic potential taking into account the ecological value of forest, the participation of the public in forest management and the availability of forest resources for it. The 2020 Forest Code gave municipalities the opportunity to take into account the needs of the local population and allow them to benefit more from the forest.

It should be noted that the Forest Code includes a requirement according to which "the Government of Georgia had to develop the criteria for determining 'forest of local importance' before 1 January 2023 and the procedure for transferring forest of local importance to a municipality<sup>22</sup>". In addition, the Local Self-Government Code<sup>23</sup> defines forest resources of local importance to municipalities and considers their management as the authority of municipalities. 2020 Forest Code of Georgia According to the statement, "Municipal Forest is a forest of local importance owned by a municipality, with respect to which management powers are exercised by the representative and executive bodies of a municipality in accordance with this Code and other legislative and subordinate acts of Georgia."<sup>24</sup>

As mentioned above, forest management by municipalities in Georgia is mainly carried out in several municipalities. One such example is Akhmeta Municipality, which oversees the management of Tusheti Protected Landscape (TPL) forest. TPL, which was created in 2003 by the Law of Georgia on the Establishment and Management of Tusheti, Batsara-Babaneuri, Ladogehkhi and Vashlovani is under the jurisdiction of Akhmeta Municipality. In 2011, the Tusheti Protected Landscape Administration was established. The competence of the administration is limited to the management of TPL. TPL was transferred to Akhmeta Municipality in 2006, and in 2011 Akhmeta Municipality Sakrebulo established the "Tusheti Protected Landscape Administration". This example will be used for the development of specific parts of cost-benefit.

Based on the example of TPL, it should be noted that the purpose of the activities of the Tusheti Protected Landscape Administration is to protect the unique ecosystem of TPL from destruction, promote tourism development, preserve and maintain the historical-cultural landscape. He/she shall be authorized to engage in the entrepreneurial activities of an auxiliary nature, from which the profit shall be consumed to realize the goals of a non-entrepreneurial (non-commercial) legal entity. Its competence includes forest registration, planning and monitoring on the territory of TPL on the territory of Akhmeta Municipality City Hall (management body), as well as the production of cutting provided for by Article 79, 80, 81 of the Law of Georgia "Forest Code" permitted in the

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21 Law of Georgia; Forest Code of Georgia; 22/05/2020; [matsne.gov.ge](https://matsne.gov.ge)

22 Law of Georgia; Forest Code of Georgia; 22/05/2020; Article 95; [matsne.gov.ge](https://matsne.gov.ge)

23 Organic Law of Georgia; Local Self-Government Code; 05/02/2014; [matsne.gov.ge](https://matsne.gov.ge)

24 Law of Georgia; Forest Code of Georgia; 22/05/2020; Article 5; [matsne.gov.ge](https://matsne.gov.ge)

protected landscape if necessary.

According to the legislation, local residents have the right to use wood resources in protected landscape forests. IN the experience of TPL the cases of illegal felling of timber have decreased significantly as a result of strengthening the enforcement of the law and improving communication with the local population. It should also be noted that the Tusheti Protected Areas Administration cannot actively respond to the issues related to the protected landscape, as its competence is protected. In relation to the landscape, monitoring is limited to monitoring and providing information to the municipality. In addition, the changes made to the spatial planning of Tusheti protected areas included changing the status of certain forest areas. This in many places satisfied the vital needs of the local population on firewood and resolved the conflict regarding the use of forest resources. However, certain challenges still remain faced, including lack of financial or technical resources.

## **2.2 Analysis of Business Processes Related to Forest Management and a brief Overview of the Necessary Processes and Recourses**

Forest management means the preservation and development of the beneficial properties of forest, environmental functions, the planning and implementation of measures for the use of forest resources, forest protection, tending and reforestation and afforestation. In the process of forest management, such methods shall be used that ensure the preservation and improvement of its biodiversity, productivity, self-restoration and vitality.

The Forest Code of Georgia explains the processes and resources necessary for forest management. At this stage, the state forest management body in Georgia is the Legal Entity under Public Law called the National Forest Agency of the Ministry. If a municipal forest is transferred to a municipality, a representative body of a local self-government shall establish a forest management body and approve a municipal forest management plan. Today, several major public agencies are involved in the forest management of Georgia. According to the legislation, the forest of Georgia may be state, municipal or private property:

- The state forest management body is the **LEPL National Forest Agency of the Ministry**, the main goals of which are: Forest care and restoration; Sustainable use of components of biological diversity in the forest area. The main objectives of the Agency are: forest management; Implementation of forest care and recovery measures; Regulation of forest use; Exercise of control in the forest area (except for license conditions) within the powers determined by legislation; Implementation of forest accounting.
- The state forest within the framework of the protected area is managed by the **Agency of Protected Areas**, the scope of which is the management of the system of state reserves, national parks, natural monuments, managed reserves, protected landscapes, biosphere reserves, world heritage sites and wetlands of international importance. The goals of the Agency are to improve the management system of protected areas, territorial administrations Ensuring functioning and control over compliance with the rules established by the legislation, planning, creating and developing new protected areas.
- The state forest located on the territory of the autonomous republic shall be managed by the **supreme representative body of the autonomous republic**.
- A municipal forest management body shall be established and a municipal forest management plan shall be approved by a **representative body of a municipality**.
- The Ministry of Environmental Protection and Agriculture of **Georgia** is an institution of the executive authority, which exercises the powers granted to it by the legislation of Georgia to ensure the implementation of public administration and state policy in the field entrusted to him/her.

- The State Sub-Agency of the Ministry of Environmental Protection and Agriculture of Georgia - **Department of Environmental Supervision** ensures the exercise of state control in the field of environmental protection and the use of natural resources (except for the fulfilment of the conditions of a license for the extraction of mineral resources or the license for the use of subsoil) throughout the territory of Georgia, including in its territorial waters, continental shelf and special In the economic zone.

Within the scope of its powers, a forest management body shall:

- Measures on forest arrangement, forest protection, forest care and reforestation, forest use;
- In order to identify factual circumstances related to individual forest areas, assess and study their condition and create a database obtained as a result of monitoring;
- From other forest users, it requires the prevention of the destruction of the forest and the termination of such an action that damages the forest;
- Participates in emergency events during natural disasters in the forest;
- Ensures compliance with fire safety rules, in case of a fire hazard, immediately provides information to the relevant authorities and participates in fire liquidation work;
- A municipal forest management body shall submit a draft forest management plan to an appropriate authorized body for approval;
- Develop and approve an annual action plan;
- Participates in the organization of forest restoration and afforestation damaged by environmental disasters, forest pests and diseases and other reasons;
- exercises other powers provided for by the applicable legislation of Georgia;
- He/she/issues the documents necessary for the proceedings of an administrative offence (including a penalty receipt and a writ of execution).

In addition to forest use, which is carried out within the framework of common forest use, special forest use may also be carried out. These processes are also managed by a forest management body. Types of special forest use are:

- Timber harvesting with agricultural felling;
- Production of non-wood forest resources, woody plants and secondary wood materials;
- Arrangement of plantation farms;
- Forest use for agricultural purposes;
- resort, recreational, Sports & Other Forest use for cultural and recreational purposes;
- Arrangement of fish farming and/or hunting farming;
- Arrangement of animal shelter and breeding;
- Placement of line structures of electronic communication networks;
- Forest use for scientific, research and educational purposes;
- Special forest use for special purposes.

The timelines and decision-making body of the right to special forest use shall be as follows:

- Special forest use shall be carried out within the framework of short-term and long-term forest use, the term of which shall not exceed 49 years;
- Special use of forest slaughter may be issued for a period of not more than 2 years;
- A decision on special forest use, including the period of use (adjustment of the requested timeframe), shall be made by a forest management body.
- A forest management body shall have the right to extend the period of special forest use within the common period of the general period of the right to special forest use

established by this article.

The public shall have the right to participate in the decision-making process related to forest management. When making decisions, the identity and culture of the inhabitants of the vicinity of the forest, as well as the traditions of forest management, shall be taken into account. According to the National Forestry Concept of Georgia, "priority should be given to meeting the needs of the local population, but all stakeholders, including non-locals, should participate in the decision-making process on forest management; In addition, local residents (in particular, women) are considered as separate stakeholders. Interested parties should have appropriate powers to participate effectively in the process. Access to forests for non-commercial purposes shall be ensured, regardless of the form of their ownership (state, community, etc.). The identity and culture of communities living in forested areas shall be recognized and supported, as well as traditional knowledge of forest use and forest preservation. The benefits received using forest resources should be fairly distributed among local, regional and common national consumers." (LEPL Natonal Forest Agency, 2019)

In addition, the state/autonomous republic/local self-government bodies participating in legal relations related to forest shall ensure the publicity and availability of information on forest management in accordance with the procedure established by the legislation of Georgia, as well as public participation in the decision-making process related to forest management.

The information necessary for forest management (areas, supplies, species, licenses, human, technical and other resources (the cost of some resources, services)<sup>25</sup> can be obtained by requesting information from the National Statistics Office of Georgia and the Ministry of Environmental Protection and Agriculture of Georgia. In addition, the prices for the implementation of specific forestry measures can be determined by the Levan Samkharauli National Forensic Examination in bureau.

In order to effectively implement forest management, it is necessary to determine the necessary human and technical resources **implementation of forestry measures**, During which the following data are identified: determining the boundaries of forest, its internal economic organization and the preparation of cartographic materials for the relevant territories, the identification of the state of forest, the species composition and the age structure, the identification of rare, relict, endemic and limited areas of plant endangerment, identification of areas of forest where possible/necessary to carry out forestry measures, as well as Determining the types, volume and/or methods of implementation of measures, determining the feasibility of belonging to forest areas and protection regime according to functional purposes, as well as determining and adjusting forest boundaries, quantitative and qualitative assessment of possible forest resources, pathological examination of forest. **Forestry is carried out by the forest management body in its territory of action once every 10 years.**

When managing municipal forests, it is necessary to solve a variety of challenges arising from certain resource bases. **Physical-technical resources**, such as specialized forestry equipment (e.g., tractors, sawmills) and all-terrain vehicles, are fundamental to the implementation of sustainable forest management practices. This includes timber extraction, preservation of forest health. Moreover, infrastructure such as roads and relevant buildings facilitate effective operations and access to forest areas. Technology also plays a crucial role; GPS systems and various software help us to plan, execute and monitor forest activities efficiently and accurately. According to the example of TPL, currently the TPL administration has only one forestry tractor to obtain wood resources. Accordingly, due to insufficient equipment and lack of human resources, a large amount of wood material remains in the forest and cannot be brought out. Also, the challenge is

the recycling of the three-lane moor obtained on the site, which was partially solved by the purchase of a sawmill with donor funding and the introduction of a paid service for its services. It should be noted that **financial resources** are needed not only for equipment and staff, but also for the constant education and training of staff, as well as for public engagement and compliance with environmental regulations.

**Human resources also play a crucial role in forest management**, because in order to effectively implement management plans, it is necessary to have specialized knowledge staff, equipped with equipment such as simple hand tools and sophisticated mechanical equipment. The Forest Code of Georgia also includes certain legislative obligations in the field of human resources. According to the Code, a forest management body shall ensure the mandatory participation of persons with the qualifications of a forester and a forestry specialist in forest management<sup>26</sup>. In addition, in order to implement the principles of sustainable forest management of Georgia, the forest management body shall ensure annually the increase in the number of persons determined by Article 83 of the Forest Code in such a way as to ensure that no less than 3500 ha in the forest is authorized by at least one person implementation. It should be borne in mind that depending on the specifics of the area (e.g., how easy it is to reach, how much the population lives in the vicinity, etc.), it is possible to take into account more than 1 person for an area of 3500 ha.

In terms of human resources, if we consider *the example of the TPL administration*, in 2011 it employed 6 people, as of now the staff list includes 17 people. In the field of human resources, TPL faces some challenges:

- Insufficient Ranger Corps suffers from a lack of skills, resources and equipment necessary for patrolling and effective protection of the territory. In addition, the need to work on the site of a lawyer and a GIS specialist of geographic information systems is evident. The TPL administration needs a staff training plan, which will be based on their vision of which and how many specialists the organization is experiencing to perform its activities more effectively.
- In the process of pasture management and monitoring, it is necessary to have qualified specialists who will have the appropriate knowledge and skills to effectively carry out pasture management. In addition, they need to periodically monitor the situation on the site and monitor the vegetation.
- In order to improve pasture management by the administrations of protected areas, it is necessary to create a special service responsible for the management of the grazing process in the system (preferably at the level of the central apparatus), which will be responsible for both pasture management and monitoring.
- In order to increase the capacity of selected personnel, it is necessary to implement appropriate training programs that should cover the issues of grazing management and condition assessment, as well as the development of skills for the use of the pasture management tool.

### 2.3 Gender Roles in Forest Management- an Overview of the Georgian Context

The legislative framework and international agreements in Georgia oblige the state to develop policies and legislation that will be non-discriminatory and ensure an equal and accessible environment for everyone. Article 11<sup>27</sup> of the Constitution of Georgia stipulates that no one can be discriminated. It is an autonomous right that may apply to any area regulated by the state.

Article 1417 of the Convention on the Elimination of All Forms of Discrimination against Women

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<sup>26</sup> Law of Georgia; Forest Code of Georgia; 22/05/2020; Article 83; [matsne.gov.ge](https://matsne.gov.ge)

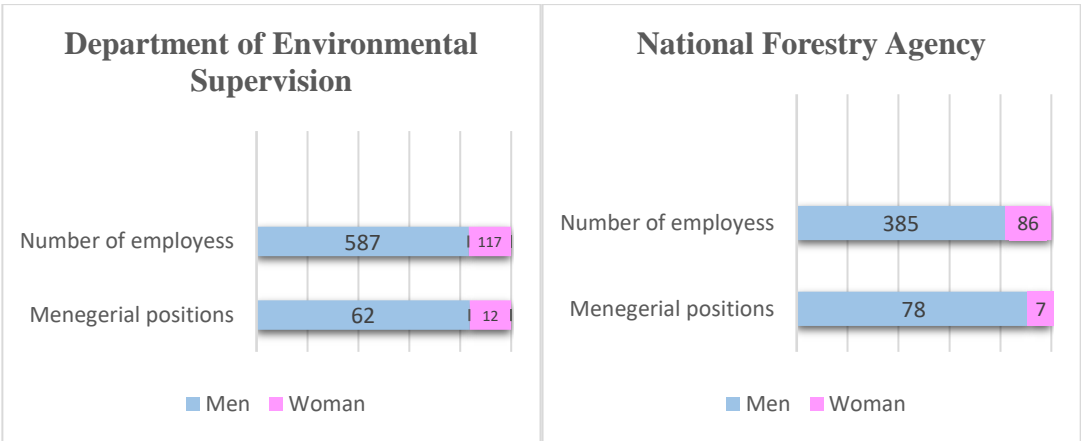
<sup>27</sup> Constitution of Georgia

(CEDAW)<sup>28</sup>, which deals with the rights of rural women, emphasizes the important role of women they play in ensuring the economic well-being of families, including in non-commodities. Although on the basis of international treaties and domestic legislation, the state is obliged to create effective policies and state programs for the realization of women's rights, gender We continue to face inequality in sectors such as forestry, energy, transport, construction, and infrastructure, where gender-based data is usually not collected. Unfortunately, gender-blind policies in the forestry sector continue and women's contributions are underappreciated, hindering women's participation in forestry policy planning and climate change management.<sup>29</sup>

According to the World Economic Forum's Global Gender Inequality Index (2023), Georgia is ranked 76th among 146 countries with 0,708 points. As of 2022, women make up 52 percent of Georgia's 3.7 million population and represent a majority.

Georgia does not describe data such as information on women's employment in the forestry sector, revenues and ownership of forestry enterprises. Only on the basis of available general information can we discuss gender mainstreaming in forest management.<sup>30</sup>

Table 1 : *The Number of employees in the management positions of the department of Environmental Supervision and National Forestry Agency of Georgia*



Based on the presented data, we can conclude that women are less employed in managerial positions in the environmental and forestry sector.

It has interesting results for the generic mainstreaming study on the example of Akhmeta Municipality.<sup>31</sup> According to which the main findings of the gender study are:

- Women living in Pankisi villages perceive that the population is dependent on the forest, but they do not realize it in everyday life. They view the forest first in terms of usefulness.
- Men and women living in the municipality participate in the collection of timber and non-wood resources from the forest. Men mainly engage in the collection of timber for construction and fuel purposes.
- Women are more actively involved in the collection of non-wood forest resources. In particular, women collect mushrooms, roses, raspberries, blackberries, blueberries,

<sup>28</sup> Additional Protocol to the Convention on the Elimination of All Forms of Discrimination against Women  
<sup>29</sup> Research on Gender Mainstreaming in Forest Management. DEPA Consulting for GIZ, 2024  
<sup>30</sup> There  
<sup>31</sup> Research on Gender Mainstreaming in Forest Management. DEPA Consulting for GIZ, 2024



berries, various grass and tree leaves for medicinal purposes.

- The managers of Pankisi guesthouses are mostly women, they host guests mainly with forest products.
- Women are also involved in buying and selling forest products.
- Women face several challenges at the start of entrepreneurship: they do not have initial funding and financial knowledge is low. The prerequisite for starting a business or participating in grant programs often involves land ownership, which is difficult because women rarely own land.<sup>32</sup>

As an example of Akhmeta Municipality, we can conclude that the role of women is quite important in the use of forest resources however, they are less involved in the decision-making process, which makes forest management less effective at the local level.

## 3 Preparing for CBA

### 3.1 Existing Legislative Framework and Available Information

The use of the Cost-Benefit Analysis (CBA) tool plays one of the most important roles for municipalities in making informed decisions about whether they want to take responsibility for municipal forest management. The CBA will allow municipalities to evaluate the goals of the decision in a numerical image.

In order to conduct a CBA tailored to the local context of Georgia, it is necessary to take into account the legislative framework that is currently operating in the country in the field of forest management. Compliance with the legal framework will provide a solid basis for cost-benefit analysis and allow integration of the local context. Forest Code applicable in <sup>33</sup>Georgia It is emphasized that the forest of Georgia should be managed in accordance with the principles of sustainable management, taking into account the ecological, social and economic functions of forest. The law reads all the principles on which sustainable forest management of the Georgian forest should be based. It is also important to note that the assessment and reporting of sustainable forest management is carried out on the basis of the criteria and indicators determined by the Regulations on Sustainable Forest Management Criteria and Indicators, which are based on the principles of sustainable development and the "criteria and indicators" adopted by the Conference of Ministers of Forest Protection of Europe ("European Forest")<sup>34</sup>. The analysis of this information can serve as a basis for identifying costs and benefits for CBA in environmental, economic or social categories.

According to the Forest Code of Georgia, **"Municipal Forest is a forest of local importance owned by a municipality, with respect to which management powers are exercised by the representative and executive bodies of a municipality in accordance with this Code and other legislative and subordinate acts of Georgia."** Accordingly, by introducing municipal forest management practices into the target municipalities, the municipality receives all the costs and benefits related to municipal forest management, which must necessarily be reflected in the CBA. Of course, at the first stage, municipalities will not be able to take this burden without state funding, and therefore it is likely that the state will play an important role in the funding part.

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<sup>32</sup> There

<sup>33</sup> Law of Georgia; Forest Code of Georgia; 22/05/2020; Article 4 and Article 5; [matsne.gov.ge](https://matsne.gov.ge)

<sup>34</sup> Ordinance No 231 of the Government of Georgia; May 2, 2022; On the Approval of the Regulations on the Criteria and Indicators of Sustainable Forest Management of Georgia; [matsne.gov.ge/1](https://matsne.gov.ge/1)



It should also be noted that Articles 20<sup>35</sup> and 21 of the Forest Code discuss the competence of municipalities and forest management bodies in the field of forest management. According to these articles, the competence of municipal bodies in the field of municipal forest management includes:

**Article 20: Competence of municipalities**

- a) the establishment of a municipal forest management body;
- b) the development and implementation of measures for the protection, tending, restoration and afforestation of forest and forest use;
- c) in cooperation with authorized state bodies for the protection, tending, restoration, and restoration of forest-  
Development of local forest and forest use programmes and facilitating their implementation;
- d) participate in the organization of reforestation and afforestation of forest damaged by environmental disasters, forest pests and diseases and other reasons;
- e) participation in the implementation of emergency measures during natural disasters in forest;
- f) the adjustment of the boundaries of the municipal forest for an authorized state body  
Submitting a proposal;
- g) the approval of a municipal forest management plan;
- h) forest use in the territory of a municipal forest in accordance with the procedure established by this Code.  
For implementation (except for activities carried out only by forest management Authority) issuance of a relevant permit document and concluding a contract;
- i) suppression of the facts of illegal forest use within the scope of his/her powers and notifying relevant law enforcement bodies of these facts;
- j) exercise other powers granted by the legislation of Georgia.

In-depth interviews with stakeholders Based on this, it should be emphasized that in the case of the implementation of municipal forest management practice, significant economic, environmental and social benefits are expected. The use of the potential that Georgian forests have will bring significant financial benefits that will be used primarily to improve the qualitative indicators of forests, which in itself will increase the potential for recreational, direct and indirect use. Also, it is important to make it possible in municipal forests (Kavtarishvili, 2023) Types of direct use Municipality the Forest Code reads and can be divided into the following categories:

- Timber harvesting with agricultural felling (m.: wood harvesting, nabel farming, briquette making, etc.);
- Production of non-wood forest resources, woody plants and secondary wood materials (medicinal plants, forest berries, mushrooms, tree seeds, etc.);
- arrangement of a nursery (breeding of forest crops, plantation, fruit-berries and decorative seedlings, making a pen, etc.);
- Arrangement of plantation farming (for obtaining manure and sash wood, poles, fruits);
- Forest use for agricultural purposes (arable land, mowing);
- Resort-recreational, sports and other cultural and recreational (camping, glamping, cottages, zipline, view arrangements, bicycle paths, off roads, rock climbing, festival arrangements, etc.);
- arrangement of fish farming (sale of fish, sports fishing, etc.);
- beekeeper;
- Arrangement of hunting farms;
- Arrangement of animal shelter and breeding;
- Placement of line structures of electronic communication networks;
- Forest use for scientific, research and educational purposes;
- Special forest use for special purposes.

In addition to direct or indirect benefits, it is also important to identify costs, which can be carried out on the basis of the legislative framework and the accounts of various organizations. For example, according

to the report "Analysis of Forest Management Capacity According to 8 Target Municipalities", it is possible to identify the costs and benefits associated with municipal forest management analyzed from the perspective of representatives of the target municipalities. It is important that it is based on this document that it is possible to perceive and analyze the specifics of the forest management process, the structure of the administration and human and financial resources managed by Akhmeta Municipality. (Kavtarishvili, 2023)

Based on the information discussed above, the initial list of available reports and data to be used for the Municipal Forest Management CBA for 8 target municipalities can be presented as follows:

1. Forest Code of Georgia; 2020
2. Ordinance No 231 of the Government of Georgia; Regulation on the Criteria and Indicators of Sustainable Forest Management of the Forest of Georgia;
3. Ordinance No 221 of the Government of Georgia; Regulation on Forest Use Rules;
4. Ordinance No 383 of the Government of Georgia; Regulations on the Procedures for the Protection, Restoration and Care of Forest;
5. Ordinance No 427 of the Government of Georgia; Regulations on the Procedures for the System, Categorization and Monitoring of the Forest of Georgia;
6. Ordinance No 496 of the Government of Georgia; Regulations on granting, terminating and determining and adjusting/changing forest boundaries;
7. Organization GEO; Based on "Analysis of Forest Management Opportunities by 8 Target Municipalities" (Kavtarishvili, 2023);
8. Budgets of the target municipalities and resolutions of the Municipal Sakrebulo;
9. Reports and statistical data of the Biodiversity and Forestry Department of the Ministry of Environmental Protection and Agriculture of Georgia, the National Forest Agency, the Agency of Protected Areas, the National Environmental Agency.

### 3.2 Impact on Economics and Environment Based on International Practice

Municipal and sustainable forest management has a significant economic impact on municipalities. Based on international practice, we can distribute these influences to several main groups (see table below).

*Table 2: Economic impact of municipal and sustainable forest management outcomes based on international practice*

N	The content of impact	Source
<b>Short-term impact (5-10 years)</b>		
1	<b>Job creation and strengthening of local economies:</b> Adoption of sustainable forest management practices can create direct employment opportunities in activities such as planting, maintenance, harvesting and processing of forest products. For example, in Colombia, community forestry projects have created jobs and supported local economies by developing income-generating companies and market opportunities for forest products. For example, in the initial phases of the project in Colombia, 66 direct jobs were created, which directly benefited 249 families.	(UN, 2019)
2	<b>Increased income from forest products:</b> Properly managed forests can improve the sustainable production of timber and non-timber products, leading to increased municipal revenues from the sale of these products.	(Forest Stewardship Council, 2023)
<b>Long-term impact (40-50 years)</b>		
3	<b>Sustainable economic growth:</b> In the long term, sustainably managed forests contribute to sustainable economic growth by ensuring a continuous supply of forest resources. This sustainability attracts investments and increases the economic sustainability of municipalities. Economic benefits include steady income from logging, recreation and tourism.	(Forest Management: Planning, Decision Making and Implementation)
4	<b>Enhanced ecosystem services:</b> Forests provide important ecosystem	(Forest Stewardship

	services such as water regulation, soil protection and carbon sequestration. These services boost agricultural productivity and reduce the costs associated with environmental degradation, providing long-term economic benefits to municipalities.	Council, 2023)
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Project ECO. Georgia aims to reduce greenhouse gases by improving sustainable management and energy efficiency of Georgia's forests to reduce the demand for fuel firewood. Based on international practices, municipal forest management can indeed have a significant positive impact on the environment and ecology, including habitat recovery and pollution reduction. Assigning monetary values for these benefits often includes methods such as the method of transferring benefits or assessing the value of avoiding environmental damage (Tietenberg & Lewis, 2016). These approaches help to quantify the substantial value of natural assets and ecosystem services maintained or improved by the project. However, in many cases, the use of these methods is limited if, within the framework of any specific study, there is no quantitative data for the context of a particular country.

Due to the scarce availability of statistics and the lack of quantitative data, they resort to the analysis of the data of academic studies at the international level and the experience of other countries. Based on the academic literature, decentralized forest management and sustainable forest management practices allow for a number of environmental impacts that can be potentially quantitatively defined. However, it should be noted that in this section it is better to have countries that are like Georgi in the experience of legislative arrangement and economic development. International experience shows that decentralized forest management has a significant impact on various environmental aspects ranging from carbon sequestration to rainwater management. Below is a list of potential environmental impacts to illustrate the potential consequences:

**Table 3: Environmental impact of municipal and sustainable forest management outcomes based on international practice.**

N	Content of impact on environment	Source
1	Based on the example of Sweden, as a result of intensive forest management, fuelwood production increases slightly during the first 40-50 years and the increase doubles after 50 years.	(Brännlund, Carlén, Lundgren, & Marklund, 2012)
2	Based on the example of Sweden, as a result of intensive forest management, biomass stocks increase quite rapidly and reach a maximum around 2080.	(Brännlund, Carlén, Lundgren, & Marklund, 2012)
3	Based on the example of the Philippines, decentralization of forest management has led to: <ul style="list-style-type: none"> <li>• Strengthening biodiversity protection</li> <li>• Increased conservation of soil (soil erosion reduced by 98%) and water resources (surface runoff reduced by 15% in the first year and by 31% in the second year)</li> <li>• Carbon sequestration</li> </ul>	(Lasco & Pulhin, 2006)
4	A study in Indonesia examined the socio-economic and environmental impacts of forest management certification/introduction of new management practices. This impact has been achieved through reduced deforestation and the creation of important protected areas for clean water and biodiversity.	(Miteva., Loucks, & Pattanayak, 2015)
5	Based on a meta-analysis, community forest management (not the same as municipal forest management) is one of two forest management interventions that have the following positive high environmental impacts: improving forest condition; on biomass and carbon dioxide amounts, water quality.	(Girolami, 2019)

In the context of the impact on the environment, it is possible to consider the positive impact of using firewood for heating on the reduction of harmful substances released when burning firewood in different types of stoves. According to the report prepared by the organization GEO, according to the representatives of the Lanchkhuti Municipality City Hall, the gasification process in recent years has relatively reduced the cutting of forests for the purpose of obtaining firewood, because the population uses gas for cooking

and other needs in the summer. Therefore, we can positively represent the active gasification process in the direction of impact on the environment.

According to the report prepared by GEO Georgia, representatives of municipalities believe that decentralization of forest management will lead to the strengthening of local self-government in other areas. For example, the experience of forest management will make it easier for the municipality to manage water resources and forest care will be a priority, so this may be an indirect impact.

Since the monetization of environmental impacts based on international studies and locally available data is also limited on the example of countries like Georgia, then based on the theoretical examples, it is possible to **qualitatively assess the** direction of influence in the case of the introduction of municipal forest management. In this case, the current situation, the status quo, is comparable to the results of the new arrangement qualitatively. The direction of influence is clarified by the main Based on the opinions of the parties involved and experts in the field, qualitative analysis can also be strengthened by all the resources and laws that are cited and listed in the previous chapter.

## 4 Conducting CBA

### 4.1 Identification of Benefits and Cost and Sources of Quantitative Data

This subsection focuses on the crucial process of identifying and categorizing costs and benefits related to the transfer of forest management responsibilities to Georgian municipalities. When studying municipal forest management, it is necessary to identify and evaluate only those costs and benefits directly related to this particular management activity, excluding other municipal functions. Based on the sources and legal framework given in the previous subsection, it is possible to identify the direct benefits and costs associated with forest management by municipalities. **It is necessary to underline that each cost and benefit reflected in the CBA should relate only to forest management and not to other municipality activities.** It is important to use a comparison with the initial state when counting. We consider the existing forest management arrangement as the initial state, and in the CBA model, we calculate only incremental costs and benefits specifically generated in the process of handing over forest management by the municipality

Below are the main categories of costs and benefits in the form of tables, which can be quantified by municipalities. For each category, the table provides an explanation.

According to the regulations of municipal budgets, for the most part, their budget revenues include their own revenues and budget share. Own revenues include taxes, grants, and other revenues. It is important to divide the mentioned categories into more specific groups and for the cost-benefit analysis of municipal forest management, to separate those parts in the monetary image that are directly related to this process. It is also important to reflect the special use dimension of the forest in the benefit categories. This is discussed in detail in the Forest Code and represents possible sources of additional, diversified incomes for municipalities. The sources of data for each category are mostly service fees provided by **the Ministry of Finance of Georgia, state forest management bodies - National Forestry Agency of Georgia, Agency of Protected Areas of Georgia. Also, the financial data of the National Statistical Service of Georgia, the National Bureau of Forensic Examination named after Levan Samkharauli, and the municipality itself. The data that is not publicly available can be requested based on the data request.**<sup>3637</sup>

It should be noted that the forest resources of all target municipalities have different characteristics. Therefore, its use and forest utilization will be different for each municipality. Therefore, the table below shows the estimated, generalized benefit categories. When conducting a cost-benefit analysis, it is important to adapt these general categories to the local characteristics of the municipality. The table also shows in a separate column as examples the average prices in practice today, which are based on various

<sup>36</sup>Resolution of the Government of Georgia No. 221 of May 18, 2021; St. Tbilisi; Regarding the approval of the regulation "On the Rules of Forest Use"; Appendix 4,5,6,7,8,9; [matsne.gov.ge](https://matsne.gov.ge)

<sup>37</sup> See appendices

sources - the Levan Samkharauli National Bureau of Forensic Expertise, the business model research developed by CENN, and the sources of the Legislative Gazette of Georgia. **It is important to note that these prices guide understanding the market situation and do not represent fixed quantities. These prices are standard average market prices. Considering the current situation, municipalities will compile the prices for each category themselves, taking into account the local context.**

*Table 4: Categories of economic benefits related to municipal forest management in Georgia for cost-benefit analysis*

	Benefit Category	Definition
1	<b>Additional resources allocated from the state budget</b>	<p>This section shall reflect the budget amendment (added cost) in case of MFM surrender. The budget of previous years, which is not related to MFM, is not recorded.</p> <p>On the example of TLD, Akhmeta Municipality Sakrebulo annually determines the budget of the administration of TLD. At the time of the establishment of the administration in 2011, its budget was GEL 48 thousand. In the following years, roads were added to the functions of the administration and the relevant funds were alarmed and the budget increased to 130 thousand GEL. In 2022, it is 361,6 thousand GEL.</p>
2	<b>Own revenues of the municipality</b>	<p>This section should also reflect its own revenues generated due to MFM's transfer and related directly to forest management.</p> <p>On the example of TDL, the administration also has its own sources of income. Tusheti has been operating since 2017 and the cost of planting wood on a volume of 1 m<sup>3</sup> is 25 GEL and 5 GEL per 1 m<sup>3</sup> volume. In addition, the administration offers customers the services for the manufacture of wood in the forest and the storage and storage of trees to the road, which is 1 m<sup>3</sup> in case of wood - 75 GEL, in case of triple wood - 150 GEL. These tariffs Differ from the values established by the legislation of Georgia:</p> <p>the sale price of 1 cubic meter of wood resources; Without transportation (from the place of storage) - leafy woody species - 75 GEL<sup>38</sup>; For transportation 90 GEL. For conifers - 70 GEL; For transportation 85 GEL.</p> <p>The service fee for issuing a ticket for timber harvesting - 1 cubic meter for timber extraction is 3 GEL<sup>39</sup>.</p> <p>Issuance of a certificate of the existence of non-wood forest resources, wood products and the right to produce secondary wood materials - 50 GEL.</p>

2.1. Taxes	In the tax category, the value added tax and all kinds of property taxes related to the forest are accrued. For example, tax on agricultural land.
2.2. Grants, donations, donor funds according to purpose	<p>Grants received after the introduction of MFM, if it relates to forest management and forestry in general - budget transfers, budget transfers, other funds.</p> <p>As an example of TDL, the Caucasus Nature Fund (CNF), a charity fund established by the German legislation in 2007, which has been assisting protected areas in Georgia since 2009, launches a project to strengthen and support the activities of Tusheti Protected Landscape Administration of Akhmeta Municipality City Hall - N(N)LE "Tusheti Protected Landscape Administration". The grant program is implemented within the framework of financial cooperation between the governments of Germany and Georgia, with the funding allocated by the German Government (BMZ) at the request of the German Reconstruction Credit Bank (KfW). Within the framework of this project, the Fund undertakes to allocate a grant in the amount of €200 000 for co-financing of the current expenditure and operating plan for 2022 – 2024.</p>
2.3. Other revenues	Revenues from ownership should be accounted for in other revenue categories; Dividends, rents, sale of goods and services, sanctions and transfers that are not allocated to other categories. All should be related to forest management.
<b>2.3.1.</b>	
<b>2.3.2. Dividends; Interest Rates</b>	If there is this category, if it is related to forest management and forest use.
<b>2.3.3. Rent</b>	This section shall reflect the categories of rents that relate to the use of forest resources directly or indirectly. For example, this category is displayed: Fees - Bun. to use resources; For the use of wood resources of the state forest; For the use of non-wood resources of the state forest; for the use of water and minerals - if it is in the forest area; Fee for the use of other unclassified natural resources; Income from land lease and transfer to management.
<b>2.3.4. Sale of goods and services</b>	
<b>2.3.5. Administrative fees and payments</b>	In this category, goods and services sold in a non-market manner shall be reflected; Fee for construction permit; The categories that relate to the forest.
<b>2.3.6. Sanctions (Fines and fines)</b>	In this category, income from sanctions (penalties and fines) for administrative offences related to forest use should be reflected.
<b>2.3.7. Transfers that are not classified elsewhere</b>	Mixed and other unclassified incomes. In this section, newly introduced taxes may be accounted for, or separated into a separate category. On the example of TL, the issue of introducing a mandatory tax is considered -



		<p>→ local tourism fee: which will be aimed at financing actions to raise the level of tourism and promote conservation in Tusheti. Additional assessments and related process necessary for the introduction of such a fee May be implemented in the form of two pilot phases.</p> <p>→ Camping fees or concessions are a common source of revenue for protected areas of Georgia - the TDL administration believes that these camping should be leased in one package to support the development and operation of more remote areas through concessions to the private sector. The current plans show that the camping organized in Tusheti will have better design and functions, so it will be possible to impose more taxes, the existing modest 5 GEL. Instead, which the Agency of Protected Areas is currently receiving for its camping sites.</p> <p>→ In order to develop concession relations, it will be necessary to introduce a differentiated tax according to the location of recreational facilities.</p>
	<b>2.3.8. Other revenues received from the special forest use The specific categories are thwarted below:</b>	In this category, all the benefits (in monetary image) received by the municipality are united, which is related to the special use of forest.
	Timber harvesting with agricultural felling	Service fee <sup>40</sup> for 1 cubic meter
	Production of non-wood forest resources, woody plants and secondary wood materials	<p>The fee for the service of preliminary registration of timber resource before the marking of forest area (except for forest areas marked as part of social cutting) or the exclusion of the state forest area: registered timber resource - 3 GEL;</p> <p>Issuance of timber origin document and/or marking with special varnishes - 3 GEL;</p> <p>Felling of firewood resources - 20 GEL;</p>
	Arrangement of a plantation farm	<p>Here and below the categories shall take into account the rights of use and other additional services that the municipality will receive as income.</p>
	Forest use for agricultural purposes	
	Forest use for resort, recreational, sports and other cultural and recreational purposes;	
	Arrangement of fish farming and/or hunting farming;	
	Arrangement of animal shelter and breeding;	
	Placement of line structures of electronic communication networks;	
	Forest use for scientific, research and educational purposes;	
	Special forest use for special purposes.	

The table above represents all the economic benefits that can be expressed in the monetary dimension based on available data, or on the basis of the performance of technical tasks already conducted or planned in the future. However, in addition to this data, the benefit category may identify parts of social and environmental influences that cannot be evaluated and monetized quantitatively based on meta-analysis.

To assess such an impact, a simplified approach to the multi-criteria analysis method (MCA) may be used. In this case, the existing condition is qualitatively compared with the alternative to "doing nothing"<sup>41</sup>, a new arrangement. MCA can be used to assess the social and environmental dimensions of MFM. Improvement of the situation in the environmental and social directions listed in Table 4 is directly related to the improvement of the economic situation in the case of the full assimilation of the benefits (types of special forest use) established by the legislation of Georgia. This analysis is presented in the table below, in which a three-stage qualitative evaluation system (i.e., +, 0, -) is proposed for analysis to show the corresponding positive (+), neutral (0) and negative (-) influences. The starting point is the status quo and is rated with "0" in all criteria for comparison. These components can be filled in and adapted to the context of a particular municipality. Qualitative/qualitative assessment involves assigning an appropriate assessment for each benefit category (see Table 4), based on the accumulated knowledge of field experts, interested parties, best international practices and research. The assessments in the table below are based on theoretical and practical, international experience.

**Table 5: A multi-criteria analysis to assess the qualitative components of municipal forest management benefits.**

	Benefit Category	Evaluation	Description
<b>Social Impact</b>			
1	The number of local businesses due to forest management has increased	+	This indicator translates into raising the standard of living of the residents of the municipality in general - employment and the disposal of the maiden income/purchasing power increases; Increases taxes on revenues from businesses
2	Increasing support to socially vulnerable populations and the introduction of programs tailored to them more	+	The municipality will have the opportunity to provide better support to the socially vulnerable population, if the forest has the potential to produce the appropriate playback – the distribution is not enough at this stage.
3	Readiness to pay the population will increase	+	The willingness of the population to pay can be expressed by the willingness to increase the existing fees for the use of forests and natural resources. In the case of MFM, it is expected that the population will be willing to prepare the added price and use the forest resources in a targeted manner.
4	Increasing recreational and green spaces for society, strengthening physical and mental health.	+	This improvement will be achieved if the municipal forest management activates the arrangement of public recreational and green spaces.
5	Improving air quality and reducing health problems associated with pollution	+	This improvement will be achieved if municipal forest management is based on sustainable principles of forest management and leads forest restoration works relevantly.
6	Increased transparency and accountability to the local population	+	Municipal forest management practices are often more transparent and accountable to the local population, contributing to trust and legitimacy in decision-making processes.  Municipalities can use local knowledge and engage

41 "Do nothing" in English



			<p>communities in forest management solutions, which will lead to more informed and socially acceptable policies and practices.</p> <p>Municipalities have the flexibility to tailor forest management strategies to meet local needs and priorities, enabling more efficient and responsible management approaches.</p>
<b>Environmental impact</b>			
7	<b>Improving the quality of the catchment and water resources</b>	+	Sustainable and proper forest management will result in the improvement of the quality and productivity of water, minerals and soil in this forest area.
8	<b>Enhanced carbon sequestration</b>	+	Promotes climate change mitigation
9	<b>Biodiversity conservation and protection of endangered species</b>	+	
10	<b>Reduced soil erosion</b>	+	Sustainable and proper forest management will result in the improvement of the quality and productivity of water, minerals and soil in this forest area.
11	<b>Strengthening biomass supplies</b>	+	Increasing biomass supplies will lead to a decrease in greenhouse effects, improved quality of forest resources, etc.
<b>Positive external factors / externals</b>			
12	<b>Increased value of property</b>	+	In the vicinity of properly managed forest lands, it is possible to increase the value of the property.
13	<b>Increasing the attractiveness of the municipality for residents and improving the quality of the environment for businesses</b>	+	As a result of properly managed forest, it is possible to increase the attractiveness of the municipality to the population in the long run, reduce domestic migration, and improve the business environment for new businesses.

Due to the fact that municipalities take responsibility for forest management within the framework of MFM, it becomes necessary to determine the appropriate costs for effective governance and sustainability. As with most benefit categories, the main categories of costs are read in the Forest Code and are related to the functions and duties of the forest management authority.

When managing municipal forests, it is necessary to take on important financial and operational responsibilities in various areas. The costs of introducing a new arrangement are fundamental and include the development and enforcement of municipal forest management policies, including investments in forest restoration, pest control and disease management, which is vital for maintaining ecological balance and forest health. Financial costs also apply to the construction and maintenance of infrastructure to reach the forest, along with the training and employment of specialized personnel. Monitoring and evaluation costs include the creation of comprehensive systems for biodiversity tracking and periodic assessments for refining management strategies and more.

It should also be noted that the forest resources of all target municipalities have different characteristics, therefore, the costs of its management may vary for each municipality. Therefore, the table below shows the probable, generalized cost categories. When conducting cost-benefit analysis, it is important to adapt these general categories to the local characteristics of the municipality.

**Table 6. Categories of economic costs related to municipal forest management in Georgia for cost-benefit analysis**

	<b>Cost category</b>	<b>Definition</b>
1	<b>Forest Management Body Costs</b>	This categorization is based on Article 21 of the Forest Code of Georgia.

<i>Afforestation measures</i>	<p>In many cases, these categories will be predetermined as part of the Forest Management Plan.</p> <p>Average Market Prices<sup>42</sup>:</p> <p>Promotion of natural renewal of the forest - cleaning the area from bushes, sedges and weeds- an average of 6 GEL per 1 sq/m<sup>43</sup>.</p> <p>Human Resource Expense - the exercise of powers by at least one person per less than 3500 ha in the forest under Article 83 of the Forest Code.</p>
<i>Forest Protection Measures</i>	
<i>Forest Care and Restoration and Afforestation Measures</i>	
<i>Forest Use Measures</i>	
<i>Forest monitoring measures for various purposes</i>	
<i>Emergency measures during natural disasters</i>	
<i>Costs of compliance with fire safety rules</i>	<p>On the example of TPL, forest fires pose a significant threat to Tusheti protected areas. Fires are mostly caused by natural causes and therefore the situation can be complicated against the background of climate change, the threat of potential fires can also be an increase in the number of tourists, so it is necessary to monitor the problem and strengthen the protection service so that they can detect and liquidate fire foci in a timely manner.</p>
<i>Organization of reforestation and afforestation damaged by environmental disasters, forest pests and diseases and other causes</i>	<p>In this section, we can also consider waste management. On the example of TDL, long and short-term waste management plans are developed to regulate household and agricultural waste management on the territory of TDL; And their implementation has begun. It is common to practice laying household waste in a ravine, which is also carried out by water over long distances. The area around almost all farms is heavily polluted, and the problem of manure piles, which has repeatedly become the cause of the fire, is also noteworthy.</p>
<i>Remuneration of employees</i>	Depends on the States, Foresters, Rangers
<i>Training and technical retraining costs of employees</i>	<p>In the process of implementing MFM, it becomes necessary to train new employees. On the example of TL, an insufficient Ranger Corps suffers from a lack of skills, resources and equipment necessary for patrol and effective protection of the territory. In addition, the need</p>

<sup>42</sup> See Appendix 1 and Appendix 2

<sup>43</sup> See Appendix 2, National Bureau of Expertise Information

		to work on the site of a lawyer and a GIS specialist of geographic information systems is evident. The TDL administration needs a staff training plan, which will be based on their vision of which and how many specialists the organization is experiencing to perform its activities more effectively.
	<i>Expenditure of Campaign to Raise Awareness among the Population</i>	<p>Municipalities can provide expenses related to the involvement of local communities in decision-making processes, including organizing public meetings, conducting activities and facilitating consultations with stakeholders.</p> <p>On the example of TPL, advertising activities and awareness-raising activities carried out by the Tusheti Protected Areas Administration and the Agency of Protected Areas contributed to the increase in the number of visitors and created the prospect of increasing employment and income.</p>
	<i>Costs of active advertising of updated routes and camping, recreational, tourist sites</i>	This is required in order to ensure the distribution of visitors as much as possible and more or less equitable loading of routes to avoid severe negative impacts on specific paths;
	<i>Costs of purchasing technical equipment required for forest events</i>	<p>On the example of TPL, Tusheti's internal roads require restoration and rehabilitation every year, which is why three units of road equipment were provided to the TPL administration and approved a specific budget for this case. The Ministry of Regional Development and Infrastructure of Georgia handed over three units of equipment to Tusheti Municipality City Hall (bulldozer, dumper and excavator). This is not an expense for Akhmeta Municipality, as it was given as a gift, but in other cases it is possible for the municipality to purchase this equipment.</p> <p>It should be noted that based on the experience of the LEPL Forest Agency in general, there are two scenarios for the consumption of technical equipment in the practice:</p> <ol style="list-style-type: none"> <li>1. The municipality buys equipment, pays the appropriate price.</li> </ol>

		<p>2. The municipality rents equipment and services on the outside. In this case, it will only have the cost of service.</p> <p>On the example of the LEPL National Forest Agency, Technopark does not have a forestry agency and rents these services.</p>
	<i>Other unclassified costs</i>	<p>All remaining mixed costs that are not classified into other categories.</p> <p>Arrangement / rehabilitation of forestry roads - up to 1500 GEL per 1 km.</p>
2	<b>Reimbursement of additional staff in the field of forest management in the City Hall</b>	<p>The GEO report reads that environmental specialists are employed in the mayors and councils of the target municipalities, in some cases. These shots intersect with forest management issues and forest management bodies in the future. It should be noted that the structure of this service depends on the function of the forest that is transferred to the municipality and is not unified for all municipalities. According to the Forest Code, the first step is to create a forest management body (LEPL) and recruit it.</p>
3	<b>Other unclassified expenses for the City Hall and City Council</b>	<p>On the example of TPL, the sharp increase in the number of tourists in the territory of TDL and the associated accommodation have put significant pressure on such services as water supply, waste collection and arrangement of landfills, the costs of which are covered by the administration of TPL today.</p>

The table above represents all the economic costs that can be depicted in the monetary dimension based on available data or the performance of the technical tasks already conducted or planned in the future. However, in addition to this data, the cost category may identify parts of social and environmental influences that cannot be evaluated and monetized quantitatively based on meta-analysis.

To assess such an impact, a simplified approach to multi-criteria analysis method (MCA) may also be used. In this case, the current state of affairs, the alternative to "doing nothing", is qualitatively contrasted with the new arrangement. MCA can be used to assess the social and environmental dimensions of MFM. This analysis is presented in the table below, in which a three-stage qualitative evaluation system (i.e., +, 0, -) is proposed for analysis to show the corresponding positive (+), neutral (0) and negative (-) influences. The starting point is the status quo and for comparison it is assessed in all criteria by "0". Qualitative/qualitative assessment involves assigning appropriate assessment for each benefit category (see Table 6), based on the accumulated knowledge of field experts, interested parties, best international practices and research. The assessments in the table below are based on theoretical and practical, international experience.

**Table 7: Multi-criteria analysis to assess qualitative components of potential additional costs of municipal forest management.**

	Cost Category	Evaluation	Definition
<b>Expected social impact</b>			
1	Impact on local communities	-	<p>Availability and use of forest resources: MFM may limit local communities' access to forest resources such as firewood, food and traditional medicines, which will affect their livelihoods and cultural practices.</p> <p><i>Note: although it is also possible that the influences listed here may be positive, for example, the possibility of better provision of firewood can arise rather than a restriction on firewood. Both are possible with positive impact and negative - it depends on the practice, context and individual assessment of each municipality.</i></p> <p>Visual and recreational impacts: Changes in the forest landscape can affect recreational forest use, which is an important aspect of the quality of life of the local community.</p>
2	Relocation and Land Rights Issues	-	In some cases, the implementation of forest management practices can lead to the movement of local communities or disputes over land rights, especially in areas where land ownership is not clearly defined.
<b>Expected environmental impact</b>			
3	Impact on biodiversity and ecosystem	-	Habitat disturbance: intensive forest management can lead to habitat disturbances that will affect local wildlife and plant species. Activities such as cleaning and replanting may temporarily reduce biodiversity.
4	Carbon emissions from management activities	-	The process of managing forests, including the use of heavy equipment for cutting or restoring forests, can lead to increased carbon emissions.
5	Chemical use	-	The use of pesticides and fertilizers in forest management can lead to chemical runoff that will affect adjacent ecosystems and water bodies.
<b>Negative External Effect / Externalities</b>			
6	Noise and pollution	-	Forest management operations can cause noise and pollution that will affect both the human population and the wildlife surrounding the management areas.
7	Increased risk of forest fires	-	The use of forest resources for commercial purposes can increase the risk of uncontrolled fires.
8	Risk of Corruption	-	The Geo report reveals that city hall representatives often see the risks of corruption. The risks associated with corruption deals were named "closely" by foresters (according to the mayor, corruption should not be implied here, it may be related to the fact that those who do not have the opportunity to buy firewood may be asked by foresters to obtain firewood for free);
9	Pressure on infrastructure	-	Increased activity and movement as a result of forest management operations can put pressure on local infrastructure, which will lead to degradation of roads and increase maintenance costs.

## 4.2 Discounting Benefits and Costs: Process and Technique

Based on the data of Table 2 and Table 4, it is possible to represent the benefits and expenses of these categories in a monetary image. After identifying and determining all costs and benefits, an analysis is carried out. When conducting an analysis, it is important to determine the period of time in which we are interested in evaluating a project or decision. This section shall assess how the flow of costs and benefits is distributed over the chosen time period and then discount the sum of the expected future cash flows (positive and negative) during the project lifecycle, or transfer it to the current value. If the total benefit in the current cost is higher than the costs, then MFM brings a net benefit to the municipality.

### Determination of cost-benefit analysis period

In the field of municipal forest management, choosing the appropriate period for cost-benefit analysis is crucial to calculate the real economic impact of management activities. **A 10-year period is chosen for targeted analysis, reflecting the consensus of key stakeholders whose interests are consistent with expected changes and impacts over a decade.** This term allows for a balance of benefits and expenses. It is necessary to emphasize the fact that most of the long-term period is required for the realization of the positive results of forest management, therefore, it is expected that the discounted cost of costs at the beginning of the CBA analysis will be exceeded.

The 10-year period means that the development of each expense or benefit category should be predicted over the next 10 years. In best practice, these projections are based on past development of the benefit and cost categories and available statistics or examples in international practice.

For example, if in any municipality the category "Other Incomes" has increased by an average of 2% from year to year in the last few years, then in the next 10 years, the model can be allowed to maintain this growth rate, unless other additional information is known. It is this approach and way for the municipality to use all categories to predict future development in order to obtain annual expected values of benefits and expenses within a 10-year period, expressed in monetary units.

### Discounting

After determining these projections comes the stage of discounting. This critical step involves transforming future benefits and costs into their current values, using the discount rate. This technique proves that the money in the present costs more than the same amount in the future due to its potential income opportunity. For this process, it is important, first of all, to select the discount rate. As this case concerns the potential benefits and costs from the municipal perspective, it is possible to use the public sector discount rate (depending on the content of the benefit and expenses), the weighted average interest rate of 8-10-year Treasury Bills of the Ministry of Finance of Georgia for 2024. In this case, the discount rate is 8.36%.<sup>44</sup>. These data are updated and variable, so they should be adjusted to use the latest data.

The chosen discount rate is consistent with the government prospect of assessing future public expenditures and benefits, reflecting the alternative cost of capital for government funds, not just private investments. The public sector rate is especially used in scenarios where projects such as MFM have an impact on the environment and social conditions and apply over a long period of time. These projects often include public goods and services such as biodiversity conservation and recreational spaces, the benefits of which are widespread among the public and not directly to stakeholders. In addition, the public sector discount rate is generally more stable and reflects the long-term investment outlook required for sustainable forest management, which requires forecasts for decades to adequately mark all ecological cycles and long-term environmental impacts. Thus, the use of this rate ensures that the CBA complies with national economic policy and sustainable management of public resources.

After the discount rate is selected, the benefits and costs for each year are discounted, then the difference between the sums of discounted benefits and expenses is found, which gives the net current value of the

project/change (NPV). This is a process in which the nominal indicators of the benefits and expenses to be incurred in the future are depicted in the current value, the "discounting rate" is a similar annual rate of the negative interest rate, which reduces future costs and benefits to determine comparable current values.

Discounted future cash flows (benefits and expenses) are calculated by the following formula:

$$\text{Discounted value} = \frac{B_1}{(1+r)^1} + \dots + \frac{B_2}{(1+r)^2} + \frac{B_3}{(1+r)^3} + \frac{B_4}{(1+r)^4} + \frac{B_{10}}{(1+r)^{10}}$$

Where:

B1 = total benefit or expense for the first year;

B2 = total benefit or expense for the second year;

...

B10 = total benefit or expense for the tenth year (as we chose in our analysis a 10-year period);

R= discount rate, in our case 7.879%.

After calculating the total discounted value of the benefit and expense, the net current value (NPV – Net Present Value) is considered to be the discounted value of the expected future cash flows (positive and negative) during the project lifecycle; In other words, the total discounted value of the benefit is lacking in the total discounted value of the costs.

In excel, the formula can easily count the net current value for both costs and benefits. The formula is as follows:

**=NPV (discounting rate; cash flows for 10 years)**

NPV is considered to be a separate benefit and separate costs. The sum of discounted future cash flows (both positive and negative) gives a net current value (NPV) that is crucial to decision-making. If NPV reveals that the total yield acceptable in 10 years exceeds the total costs, the MFM project can be considered economically viable, offering the municipality net benefit over the selected 10-year period.

### 4.3 Sensitivity Analysis

As mentioned above, in order to predict a certain period of benefits and costs, it is necessary to make some assumptions. Due to the fact that these assumptions are largely based on statistical information, the experience of the actors involved and cannot reflect future monetary flows with maximum accuracy, the result may have small errors and may not be fully realized.

Sensitivity analysis is an important component of CBA, especially in projects such as municipal forest management, where long-term environmental and economic outcomes are largely indeterminate and, in many cases, cannot be assessed quantitatively. This analysis evaluates how sensitive CBA results are to changes in key assumptions and variables, such as discount rates, cost estimates, and yield forecasts. The primary goal of sensitivity analysis is to identify which variables have the most impact on the results and quantitatively determine how the changes in these variables change the expected results of the project.

**Sensitivity analysis process:**

1. **Identifying key variables:** The first step in conducting sensitivity analysis is to identify key variables that are likely to have a significant impact on CBA results. In the context of MFM, this may include discount rates, estimated costs of forest management activities, predicted benefits such as carbon sequestration and recreational values, and assumptions about the rate of ecological recovery or degradation.
2. **Determining the range of each variable:** After identifying the main variables, it is important to determine a credible range for each that should reflect the potential variability or uncertainty of a given variable. For example, the discount rate may vary due to changes in economic conditions or policy decisions.
3. **Analysis:** Using defined ranges, the analysis involves multiple computations of CBA, changing one or more variables each time within their specified range. This can be done with simple "what-if"/"what-if" scenarios or more complex statistical methods that use random selection to study a wide range of results. At the initial stage, it is recommended to concentrate on a simple approach.
4. **Results analysis:** It is important to analyze how sensitive CBA results are to changes in each variable. This includes an observation of how changes in each variable affect the net current value (NPV) or other relevant metrics used to evaluate the project. The results will help identify

the "most risky" variables that lead to the most significant changes in results.

5. **Documenting and presenting sensory analysis results.** This process should include a detailed discussion of how variations of each key variable affect the economic viability and sustainability of the project. The reporting should also include a range of potential outcomes that give decision-makers a clear understanding of the possible risks and benefits associated with the project.

Sensitivity analysis is especially important in municipal forest management due to inherent uncertainties related to long-term environmental projects. Factors such as climate change, economic fluctuations and changes in public policy can significantly change the CBA's key assumptions. By understanding which variables have the biggest impact on CBA outcomes, policymakers and stakeholders can make more informed decisions that take into account the potential variability and risk associated with the project. In addition, this analysis can guide future research and data collection efforts, highlighting which variables require a more accurate assessment to reduce uncertainty in CBA results.

#### **4.4 Cost-Benefit Analysis Results**

The final stage of the cost-benefit analysis of municipal forest management already deals with the interpretation of the results and evaluates the impact of the decentralized forest management scenario on resource allocation, employment opportunities and decision-making processes. This analysis is also critical to understanding the differential impact of forest management decisions on different gender groups and ensuring equal distribution of benefits and costs if these gender differences and influences are evident within any municipality.

The results should describe in detail how the benefits and costs of forest management are distributed to the public. This includes figuring out who benefits from increased jobs, better forest products, improved ecosystem services, and who has the costs. The results of the sensitivity analysis should be included to demonstrate the impact of the variability of key economic assumptions, such as discount rates or cost estimates, on the distribution of benefits and costs in different scenarios. In general, if the NPV reveals that the total benefit acceptable for the chosen period exceeds the total costs, the MFM project can be considered economically viable, which will offer the municipality net benefit in the selected period and vice versa if the NPV is negative.

The guidelines presented in this analysis are based on Georgia's experience in municipal forest management. However, it is necessary to recognize that each municipality has a unique environmental, economic and social context. Therefore, these guidelines must be adapted to reflect the specific conditions and needs of each municipality. When applying these guidelines, municipalities should take into account local demographic data, cultural practices and economic conditions to ensure that CBA results are relevant and effective to inform local forest management policies.



## 5 Conclusions

The implementation of cost-benefit analysis (CBA) is a critical step towards achieving the Sustainable Development Goals in Georgia in Municipal Forest Management. This manual outlines a structured approach for municipalities so that they can systematically assess the economic, environmental and social impacts of forest management initiatives. By adopting these practices, municipalities can ensure their decisions are both economically viable, as well as ecological sustainability and social justice.

### Key findings:

- **Comprehensive (Holistic) Assessment:** The guide emphasizes the importance of a comprehensive assessment that includes direct and indirect costs and benefits. This approach ensures that all potential impacts in the decision-making process are taken into account, both positive and negative.
- **Informed decision-making:** By establishing a clear framework for the CBA, the instructions enable municipal authorities to make informed decisions based on quantitative and qualitative data. This reduces the dependence on intuitive judgments and increases transparency and accountability of the decision-making process.
- **Economic Resilience and Sustainability:** The guidance highlights the importance of sustainable forest management practices that promote long-term economic growth. Properly managed forests can bring significant economic benefits by creating jobs, increasing revenues from forest products, and improving ecosystem services.
- **Environmental Protection:** The manual emphasizes the important role of forests in providing ecosystem services such as water regulation, soil protection, and carbon sequestration. Sustainable forest management practices help maintain these services, promote environmental protection and mitigate climate change.
- **Social and Gender Equality:** Integration of Gender Perspectives and Emphasis on Community Engagement are key components of the textbook. Engaging all stakeholders, especially women, in the decision-making process leads to more inclusive and fair forest management outcomes.

### Further steps:

The successful implementation of municipal forest management practices requires constant effort and cooperation between various stakeholders, including government bodies, local communities and international partners. Municipalities should invest in capacity building and training to equip their staff with the necessary skills and knowledge. In addition, promoting active community participation and using local knowledge will increase the effectiveness and sustainability of forest management initiatives.

The findings and recommendations of this manual should be informed about policy development both locally and nationally. Policy makers should ensure that the legislative framework supports the principles of sustainable forest management and provides adequate resources for implementation. In addition, policy should promote gender equality and engage different perspectives in forest management planning and implementation.

Finally, the Cost-Benefit Analysis Manual in municipal forest management is a valuable tool for strengthening the sustainability and efficiency of forest management practices in Georgia. Using this guideline, municipalities can make well-informed decisions that will balance economic growth with environmental protection and social welfare.

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## 2. Appendices

Annex 1: On the Approval of the Regulation on Forest Use Rules; Annex 4,5,6,7,8,9

[On the Approval of the Regulation on Forest Use Procedures](#)



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Appendix 2: Prices provided by the Levan Samkharauli National Forensic Bureau.



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Appendix 3: Cost-Benefit Analysis Model



- CBA MFM  
Template.xlsx





GREEN  
CLIMATE  
FUND



Schweizerische Eidgenossenschaft  
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