



No. 54/36

# SOCIAL USE OF TIMBER RESOURCES



Performance Audit Report

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Ensuring safe and healthy environment is priority for the state, for which is important to maintain the forest and use it in sustainably.

Nowadays in the regions for the population and public entities firewood is the main source of the heating, respectively demand on the resource is high. Based on existing situation, significant importance is assigned to sustainable management of the forest, implementation of it is obliged under the Association Agreement between Georgia and EU. Also, planned reforms of forestry sector and adoption of new Forest Code emphasis forest policy and current measures applied by the forest managing entities. Due to existing challenges in the sector State Audit Office studied social sector of

timber resource use.

In the following report are discussed malfunctions, existing in the social sector of the forest timber resource use, correction of them will support filed development, optimization of utilized resource in public sector, sustainable and energy efficient usage of the timber resource.



State Audit Office

## **Social Use of Timber Resources**

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2016

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## **Terminology and Abbreviations**

MENRP – Ministry of Environment and Natural Resources Protection

NFA – National Forestry Agency

Residue biomass – remnants from manufacturing timber resources and from agricultural production

Geostat – National Agency for Statistics

Agency – National Forestry Agency

Ministry - Ministry of Environment and Natural Resources Protection

LEPL – Legal Entity of Public Law

AYPEG – Association of Young Professionals in Energy of Georgia

CENN – Caucasus Environment NGO Network

FAO – UN Food and Agriculture Organization

USAID – United States Agency for International Development

UNDP – UN Development Program

WEG – World Experience for Georgia

## Executive Summary

Protection and conservation of the forest is crucial for ensuring healthy ecological environment in the country. Due to existing social-economic background in the regions of Georgia, the demand on timber resources as the source of energy is high. High dependence of population on firewood, complicates implementation of measures for forest conservation.

The State Audit Office examined the system of social use of timber resources and revealed number of shortcomings that are related to: inadequate response from the Ministry and the Agency to the deficit of firewood resources, irrational use of firewood in the public sector and non-energy efficient use of the firewood resources.

The population obtains firewood resource through social felling activities that is regulated under the Forestry Code of Georgia. According to the data of the NGOs and the National Statistics Office of Georgia, social consumption of firewood significantly exceeds the volume of resources that are obtained through social felling activities. Therefore, this circumstance indicates firewood deficit in the social sector. In particular, the volume of resources allocated under the social felling activities are insufficient for the population and due to lack/high cost of the alternative heating resources the population consumes the firewood of illegal origin. Increasing trend of illegal felling also indicates a shortage of the firewood resources.

The State Audit Office considers, that for achieving sustainable forest management and for identifying real use of forest in the social sector, it is necessary to restrict market of illegal timber realization and ensure legal consumption of firewood in the social sector. In order to actually achieve sustainable forest management, parallel to legal satisfaction of firewood demand, the Ministry and the responsible public sector, under joint efforts, should gradually reduce demand of population on firewood and their dependence on the forest resources.

As a result, the audit revealed that social felling activity is not sustainable, because the Ministry allocates resources through social felling without accurate and full information required for sustainable forest management. Consequently, it is impossible to estimate the negative impact of social felling on the environment. The problem is caused by the fact that forest inventory has not been conducted, therefore, it is unclear whether annually allocated timber resources equal to the optimal volume of annually harvestable timber resources.

Through study of firewood reduction potential, it was identified that residue biomass can be used to decrease the deficit of firewood resources in the country. Also, there is an opportunity of reducing consumption in the public sector by substituting firewood with the natural gas at the gasified objects. Resource request by the public sector is unfounded that causes inefficient and non-economical consumption of firewood. In case of presence of the justification procedures, it is possible to optimize the use of timber resources and consequently reduce the volume of consumed resource in the public sector.

At the public schools there is a practice of purchasing/consuming illegally obtained resource under the state funding. This is caused by the fact that schools purchase firewood from the private persons bypassing the social felling activities. For the schools not participating in the social felling activities,

the legitimate way of purchasing timber is from timber production license holders. In 2015 license holders produced twice less firewood than the schools that did not participate in the social felling activities consumed. Limiting illegal wood consumption at the public sector shall facilitate restriction of illegal markets of timber resources.

Another way of reducing deficit is energy efficient consumption of the resource. For the energy efficiency of the firewood, it is necessary to dry them in advance and thus obtain maximum heating energy from the resource. As a result of inquiry it was established that the population consumes raw firewood and therefore the thermal loss reach 40%. The Forestry Agency allocates majority of resource in late summer-autumn period. Consequently, the firewood is not sufficiently dry during consumption and maximal benefit cannot be reached. By determining the correct utilization terms it will be possible to ensure minimal period necessary for drying.

The present report addresses above-mentioned shortcomings, their causes and relevant recommendations. The State Audit Office believes, that implementation of the recommendations, will establish sufficient environment for sustainable forest management and potential for reducing dependence on firewood.



## 1. Introduction

### Audit Motivation

The forest represents the natural protector from landslides, avalanches and river erosions. It affects the oxygen and carbon balance, facilitates water supply of rivers and lakes and prevents floods. Felling of forests facilitates creation of natural disasters (landslide and avalanche). According to CENN data, as a result of natural disasters linked to incorrect forestry management, Georgian economy incurs annually 200-250 million GEL worth loss.<sup>1</sup>

Rational use of forest resource and introduction of the sustainable management principles secures bio diversity of forests, ensures its preservation and viability. With support of the governing entities, the forest should always perform ecological, economic and social functions, without damaging the eco systems. This principle should be taken into consideration by all involved parties (state, private sector, population), who participate in the forest resources management and utilization.

The commitment to facilitate sustainable management of the forest is incorporated in the article 233 of the Association Agreement between Georgia and EU, according to which, the parties acknowledge the significance of sustainable management of forest and the role of forest in achieving economic, environmental and social goals. Georgia undertakes the commitment to exercise special measures to facilitate protection of the forest, fight against illegal tree felling and associated trading.

The State Audit Office in 2015 studied the condition of timber commercial resource management. As a result of the audit the problems existing in the sector were revealed, among them shortcomings related to exercising state control of the licensed area and prevention of the illegal tree felling. For the purpose to fully cover the issue of timber use, in 2016 the performance audit was planned over utilization of timber for social purposes.

According to the National Forestry Agency data, 38% of the entire territory of Georgia (6,970,000 ha) is covered by the forest (2,621,977ha)<sup>2</sup>. For majority of Georgian population wood represents the direct energy and demand on it is accordingly high.

According to NGOs, felling is more widespread than it is recorded by the state entities. For example, according to the survey held by USAID-AYPEG<sup>3</sup> - consumption of firewood by population in 2013 comprised about 4,6 million m<sup>3</sup> which exceeds 8 times the resource extracted under the social tree felling program in the same year – 518,000m<sup>3</sup>. According to the same organizations, the population uses illegally obtained resource to meet the demand on firewood.

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<sup>1</sup> CENN, *social felling from legal viewpoint*, 2015.

<sup>2</sup> Ministry of Environment Activity report of the National Forestry Agency of 2013, this data does not include forest area of occupied Abkhazian A-R.

<sup>3</sup> USAID-AYPEG, *Household Energy End-Use Survey*, 2014



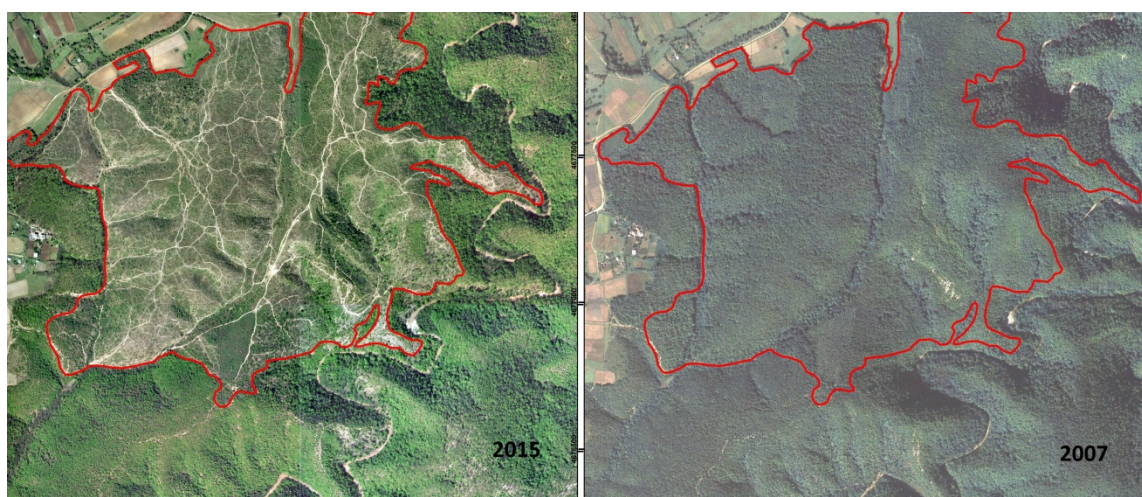
According to the National Forestry Agency, from 2013 until 2015 the number of illegal forest usage activities has significantly raised, consequently the harm to the environment has increased (see table 1.1).

**Table 1.1:** Illegal forest use cases and incurred damage during 2013-2015

year	2013	2014	2015
Number of Illegal Forest Use	1,078	3,507	3,266
Damage to the environment (in GEL)	418,284	5,289,147	8,361,019

The above indicated problems will have negative effect on the condition of forests. Picture 1.2 shows degraded forest near village Katskhi, at Chiatura rayon, region of Imereti. This example clearly shows the result of illegal forest usage that for this period (2007-2015).

**Picture 1.2:** Forest area degraded at village Katskhi as a result of illegal felling <sup>4</sup>



Due to above indicated problems, it is necessary to search for the underlying reasons and undertake respective measures. It is important to correctly plan and allocate forest resources, as well to consider population interests and the principles of sustainable management of the forest.

### Audit Problem and the Questions

The problem of audit is unsustainable usage of timber resource in the social sector. In particular, insufficient response from governing bodies on deficit of firewood and non-energy efficient use of obtained resource.

The purpose of the audit is to estimate sustainability and effectiveness of measures undertaken by the responsible entities on use of timber resources in the social sector, investigating the reasons of

<sup>4</sup> Source: Ministry of Environment and Natural Resources Protection

above indicated problems and issuing respective recommendations. Accordingly, for this purpose, the audit should answer to the main question and sub-questions:

**To what extent Ministry's system of timber resource provision to population ensures preservation of the forest fund?**

- › *How adequately the measures and procedures of the Ministry respond to the firewood deficit problem?*
- › *On which factors does reduction and optimization of firewood consumption in the public sector depend on?*
- › *What causes non optimal periods of extraction of resource within the social felling?*

## **Audit Scope and Methodology**

In order to answer the main question, the State Audit Office studied the existing conditions from 2013 through the first half of 2016.

The following methodology was used at the stage of main study of audit:

- › documental analysis of the legislation and overview of procedures and legislative norms existing in the social felling;
- › study of the international practice of sustainable management of forest;
- › analysis of information (strategy, annual reports, financial and statistical data) provided by the audit objects;
- › interviews with audit objects and the stakeholders;
- › Meetings with the international organizations and local NGOs (Green Alternative, CENN, WEG) for the purpose to analyze the problems identified by them.

The following procedures and methods were used to respond to audit questions:

**For the purpose to estimate appropriateness of the policy and procedures of the Ministry in terms of solving firewood deficit problem**, the audit team has searched and analyzed the information on current and planned measures aimed at reducing the firewood deficit; the team has studied the information about the firewood resource deficit and the researches of various organizations; compared official and unofficial data of timber consumption.

**For the purpose to identify the factors supporting reduction and optimizing of the consumed firewood by the public sector** the audit team studied the dynamics of resource consumption in the public sector; for the purpose to facilitate economic consumption of the resource, analysis of consumed resources by the public schools in the regions was held and the potential of resource consumption reduction has been revealed. Also, the audit team studied mediations of requests of firewood resource by the public sector.

**For the purpose to identify the factors determining non-optimal periods of resource extraction within the social felling** the audit team identified seasons for extraction of resource, has calculated

resource saving potential, in case of its obtainment in the optimal period and accordingly in case of its consumption in an energy efficient manner; for the purpose to identify the reasons of non-optimal periods of harvesting, determined the resource allocation terms and using uniform base of timber resources management studied the time/period of extraction by the households participating in the social felling.

### Assessment Criteria

In the analysis of social felling, most important is to consider the principles of sustainable forest management. This principle was one of the key criteria of PA of Forest Commercial Resource Management in 2015.

- › According to FAO, sustainable management of forest is the concept which is aimed at maintaining and expanding all kinds of economic, social and ecologic values of the forest for the welfare of the present and future generations<sup>5</sup>.  
The principle of sustainable management implies forest maintenance, for this purpose it is necessary to keep annual felling of wood resources in the range of natural annual increase of the forest.
- › According to sustainable energy source principles of FAO, by adhering to forest sustainable management principles it is possible to use wood resources as a source of sustainable and renewable energy. Use of forest resources for energy purposes is deemed as renewable energy and having no harmful impact on the environment, provided that it meets the following terms:
  - The resource is obtained under the conditions of sustainable management of forests;
  - The resource is consumed using energy efficiency way.<sup>6</sup>

The audit group also used legislative acts regulating social felling as audit criteria:

- › Forest Code of Georgia;
- › Resolution of the GoG on forest inventory, planning and monitoring rule<sup>7</sup>
- › Law of Georgia on Management of the Forest Fund<sup>8</sup>
- › Resolution of the GoG on Forest Usage Rule;<sup>9</sup>
- › Resolution of the GoG on Forest Maintenance and Restoration Rule.<sup>10</sup>

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<sup>5</sup> FAO, Definition of Sustainable Forest Management, available: <http://www.fao.org/forestry/sfm/en/>. Resolution of the Parliament of Georgia N1742, „Georgian National Forestry Concept Paper“, 2013.

<sup>6</sup> FAO, *States of World Forests*, 2012.

<sup>7</sup> Resolution of the Parliament of Georgia N1742-Il, On Approval of National Forestry Concept Paper, Kutaisi, December 11, 2013

<sup>8</sup> Law of Georgia on Management of the Forestry Fund, July 6, 2010

<sup>9</sup> Resolution of the GoG N242 on approval of the forest usage rule  
Tbilisi, August 20, 2010

<sup>10</sup> Resolution of GoG N241 on forest maintenance and restoration rule Tbilisi, August 13, 2013

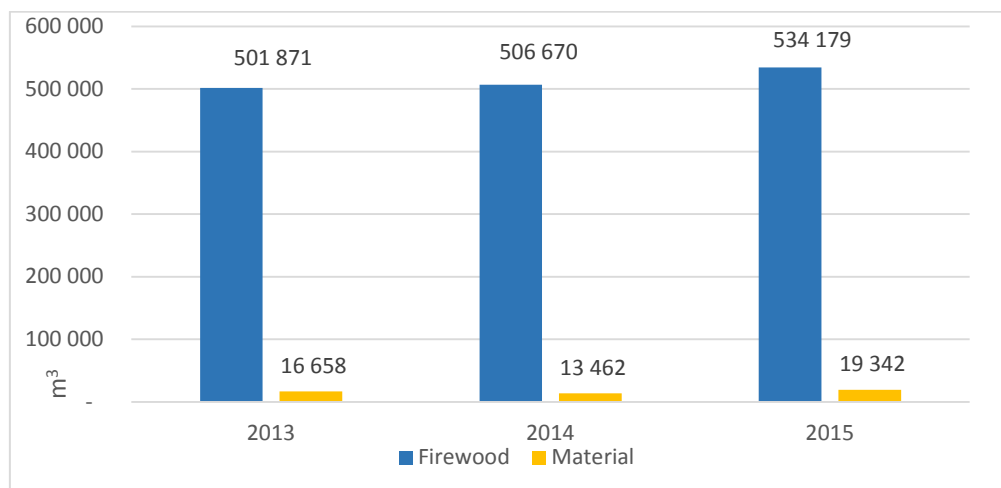
## 2. General Information on the Sphere of Audit

Meeting the demand on firewood in the regions of Georgia is exercised through the social tree felling activities. **Social felling** includes implementation of measures to provide wood for non-commercial purposes for the following stakeholders:

- › Population;
- › Budget organizations and LEPLs;
- › Other entities determined by GoG.<sup>11</sup>

Budget organizations include kindergartens, schools and state entities. Use of wood obtained through social felling is permitted only for personal purposes and cannot be sold.

**Diagram 2.1.1:** Volume of resource obtained within the social felling<sup>12</sup>

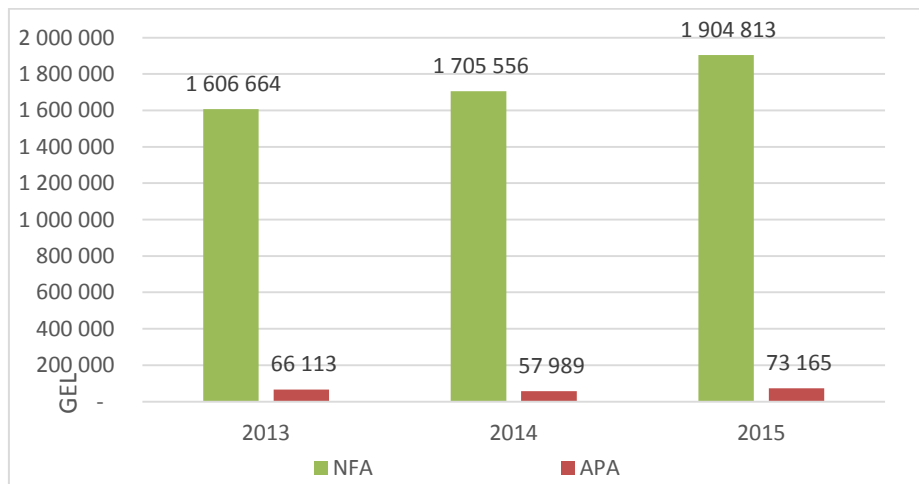


Within the social felling, firewood and raw timber is allocated to the population. For social felling, the resource is allocated by LEPL – National Forestry Agency and LEPL – Agency for Protected Areas. Accordingly, these agencies receive revenues for resource usage. For social felling, the population pays a fee – 5-7GEL per 1m<sup>3</sup> wood. Out of this amount, the agencies receive fixed service fee 3 GEL, the remaining amount, 2-4 GEL is transferred to the budget of the local self-governing body. In addition to the fee, the population incurs expenses for obtaining and transporting, which, according to the regions comprises on average 85 GEL per 1m<sup>3</sup><sup>13</sup>.

<sup>11</sup> Forestry Code of Georgia, Article 5.

<sup>12</sup> Obtained resource includes the resource obtained at NFA and PTA territories

<sup>13</sup> CENN, current situation in terms of forest management and its impact on population 2013.

**Diagram 2.1.2:** Revenues from social felling

Despite the large scale of the forest fund - 2,621,977 ha, at 43% of the forest fund of Georgia tree felling is prohibited<sup>14</sup> since this area bears special functional importance (areas with 35° higher slopes, water protection etc.) (See table 2.1.3).

**Table 2.1.3:** Distribution of the Forest Fund of Georgia

	Area (Ha)	%
Total Area	2,621,977	100%
Felling is Forbidden	1,115,469	43%
Licenses	182,197	7%
Protected Area	380,800	15%
For Social Felling	943,511	36%

Hence, the total area less protected areas (380,800ha)<sup>15</sup> and licensed areas (182,197 ha)<sup>16</sup> remains the part of the forest fund, where it is possible to allocate the resource for social felling - 943,000 ha (see. map 2.1.4).

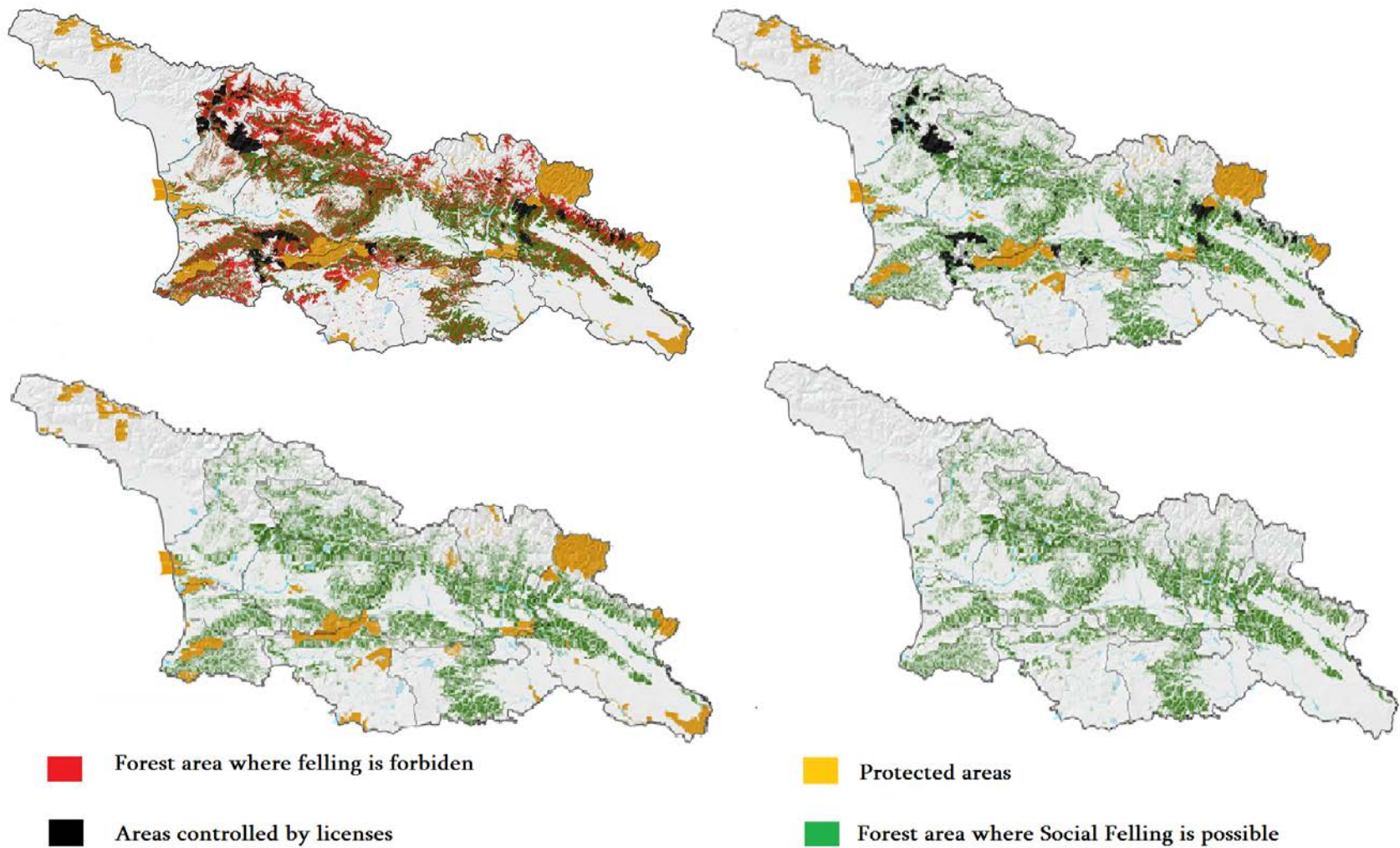
<sup>14</sup> In this area, felling for main usage is prohibited, but maintenance cuts are permitted.

<sup>15</sup> the Agency for Protected Areas allocated small amount of firewood (see the schedule 2.3.2)

<sup>16</sup> total area of licenses as of 2013



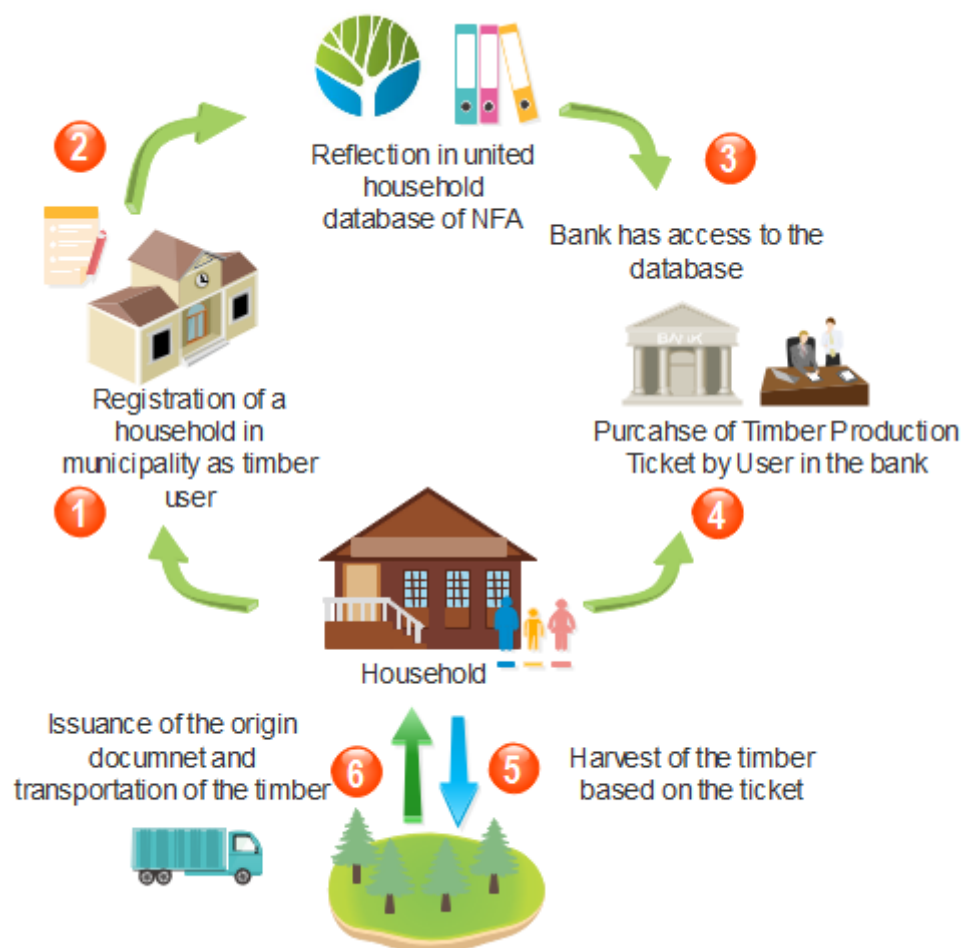
Map 2.1.4: Functional distribution of the forest fund of Georgia



## 2.1 Social Felling Procedures

Legitimate social wood felling requires the following procedures:

**Scheme 2.2.1:** Procedures necessary for social felling of trees



### 1. Registration of the wood user

For usage of II category (firewood) wood, the self-governing bodies produce the list of household representatives which is reflected in the electronic system for management of wood resources existing at the national forestry agency. During the calendar year, maximal amount of the II-nd category wood to be allocated to one household is 7 m<sup>3</sup>, for the mountainous settlement areas - 15 m<sup>3</sup>.

Registrations of I-st category (material) wood requesting persons are exercised on the basis of the mediation submitted to the state governor to the management body.

### 2. Acquiring Wood Processing Tickets

The citizen registered at the electronic system, on the basis of the ID card shall acquire the ticket for timber extraction. The citizen pays the fee of natural resources and for the service at “Liberty Bank” branch which has the access to the electronic system of wood resources management. The ticket



includes information on wood user, location of felling area, species, amount, and the quality of wood.

### 3. Obtaining Wood Resource and Transportation

The citizen, with the timber ticket and respective bank payment receipt addresses the forest guard – an authorized employee of the forest fund management body, who, on the basis of the ticket, shall issue the wood origin document (in case of 1st category wood, makes special sign to the log).

The timber origin document is filled out at the place of wood processing or loading and represents the document evidencing the legitimate origin of the timber. After issuing the document of origin, the user has 12 hours to transport the resource.

## 2.2 Audit Objects

Over the past years, structural changes have been exercised in the forestry sector. In 2013, the forestry sector was withdrawn from the Ministry of Energy and was subordinated to the Ministry of Environment and Natural Resources Protection. Hence, the Ministry of Environment and its subordinated LEPLs are responsible for social use of wood.

*The objects of audit are:*

- › Ministry of Environment and Natural Resources Protection
  - LEPL – National Forestry Agency;
  - LEPL – Protected Territories Agency.

**Ministry of Environment and Natural Resources Protection** (hereafter – *Ministry*) manages forest resources. Main tasks of the Ministry are:

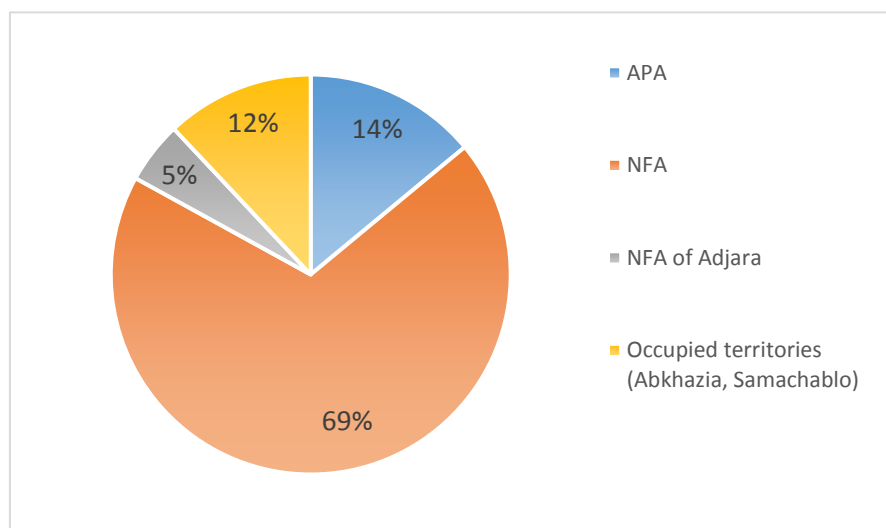
- › Facilitating sustainable development of the country and organizing environment planning system;
- › In the sphere of environment protection, development and implementation of state policy, targeted programs, strategy and management plans;
- › Protection and preservation of atmospheric air, water, land, subsoil and bio diversity;
- › In the scope of the competence, performing liabilities established by Georgian legislation and international commitments established in the sphere of environment protection.

The entity determining the forest management policy of the Ministry is the **Bio Diversity and Forestry Policy Department**.

**LEPL National Forestry Agency** was established in 2013 and incorporated legislative and management functions of the forestry sector. The agency includes: forest maintenance, inventory-stock taking and forest usage departments. As of 2016, there are 980 employees in the agency and is

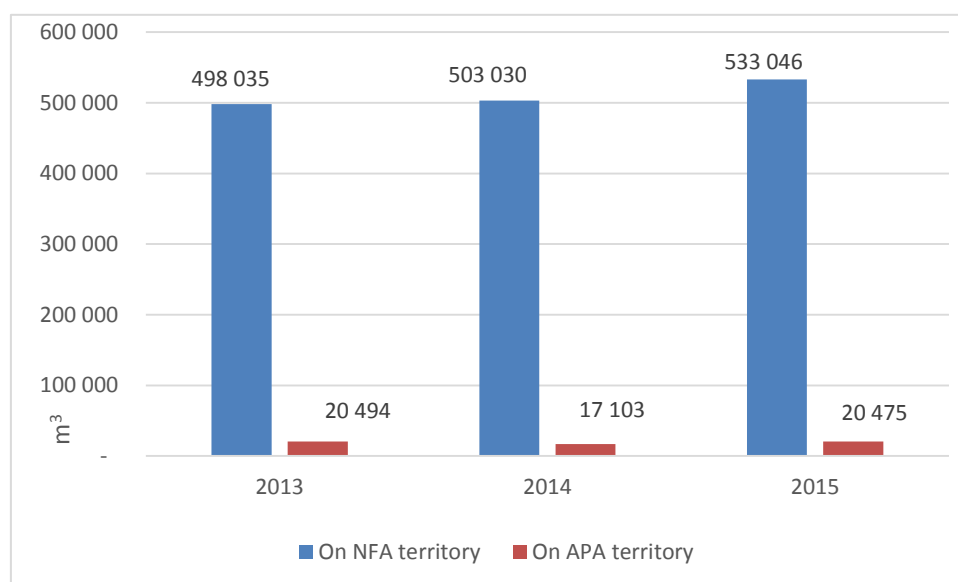
composed of the central office and regional services. The agency manages 69.5% of state forests which is around 1,821,883 ha <sup>17</sup> (see the schedule 2.3.2).

**Schedule 2.3.1:** Management of the forest fund of Georgia (ha) <sup>18</sup>



*Forest Usage Department*, along with the regional forestry services, works on the issues of firewood allocation, felling areas and planning of forest roads.

**Schedule 2.3.2:** Resource utilized in the areas managed by the agencies in the scope of the social tree felling program



<sup>17</sup> source: Ministry of Environment and Natural Resources Protection

<sup>18</sup> Report of activities of the national forestry agency 2013-2014.

*Forest guards employed at the regional offices of the Agency* exercise monitoring of the forest area and also, the regional service foresters are tasked to manage the resource allocated for the social tree felling purposes.

Main activities of the Agency include forestry fund management and its purposes are:

- › Sustainable management of the forestry fund – to preserve its useful functions and bringing maximal benefit to the public out of these functions;
- › Forest maintenance, forest restoration and renewal measures;
- › Planning multi-purpose, effective and sustainable forest usage;
- › Forest inventory;
- › Control of forest fund.

**LEPL Protected Territories Agency** – is the part of the Ministry system and manages state restricted areas, national parks, natural monuments, protected landscapes and territories of international significance.

Overview of the activities of this agency is relevant in terms of forest usage as felling areas are allocated in the territories subject to the agency management.

Total area of protected territories is 585,883 ha. This includes swamps, alpine meadows, rivers, lakes and sea water area. 65% of this area is covered by forests, comprising 380,000 ha. The Agency manages 20 territorial administrations, resource is allocated for the social felling purposes in 9 of them. In the Agency, as of 2016, there are 310 rangers and 23 natural resources specialists employed, who exercise firewood resource allocation in the scope of the social felling activities.

### 3. Measures of the Ministry and the Agency may not guarantee forest preservation and due reaction on firewood deficit

On the background of the social situation in Georgia, the demand on forest resources as a source of energy is high. 95% of rural population <sup>19</sup> in winter uses firewood for heating purposes.<sup>20</sup> In 2013-2015, under the social felling activities, the forest managing bodies allocated - 2,169,409 m<sup>3</sup> <sup>21</sup>timber. In Georgia, on average 700,000 m<sup>3</sup> firewood resource has been allocated over the past three years.

#### Social Problem – Dependence of the rural population on firewood

In the social sector of timber resource usage there is the deficit of firewood resource, which is caused by the social and economic background existing in the country. In particular, the resource allocated by the Ministry does not fully meet the demand of the population, and on the other hand, due to absence/high value of the alternative energy sources, the population extracts illegally, or purchases the resource obtained this way. Real firewood consumption, according to various surveys conducted by the NGOs and the public sector, significantly exceeds the amount allocated under the social felling program (see the table 3.1). The State Audit Office, in order to estimate the difference between the demand and supply of the firewood, relies on the data of the National Statistics Service (Geostat), according to which social consumption of firewood is the least in the given surveys – 2.4-2.5 million m<sup>3</sup>.

**Table 3.1:** The average difference between firewood consumption and the allocated resource according to the surveys

Survey/Year	Firewood Consumption (m <sup>3</sup> )	Utilized resource (m <sup>3</sup> )	Consumption is higher than allocation	Difference - deficit (m <sup>3</sup> )	% of illegal cuts
USAID-HPEP (2014) <sup>22</sup>	4,614,851	595,324	8 -times	4,019,527	87%
CENN (2015) <sup>23</sup>	5,300,000	628,037	8- times	4,671,963	88%
Geostat <sup>3</sup> (2014)	2,474,800	597,277	4 -times	1,877,523	76%
Geostat (2013)	2,543,200	595,324	4 -times	1,947,876	77%

#### Illegal Forest Usage

Taking into consideration that consumption of the resource is 2,4million m<sup>3</sup> and out of the resource allocated by the forest managing entities within the social felling, for the past three years on average

<sup>19</sup> Geostat, rural population -1,591,900, urban population -2,128,525, as of 2016.

<sup>20</sup> CENN, *consumption of the firewood in Georgia, estimation of the demand supply and the potential*, 2016.

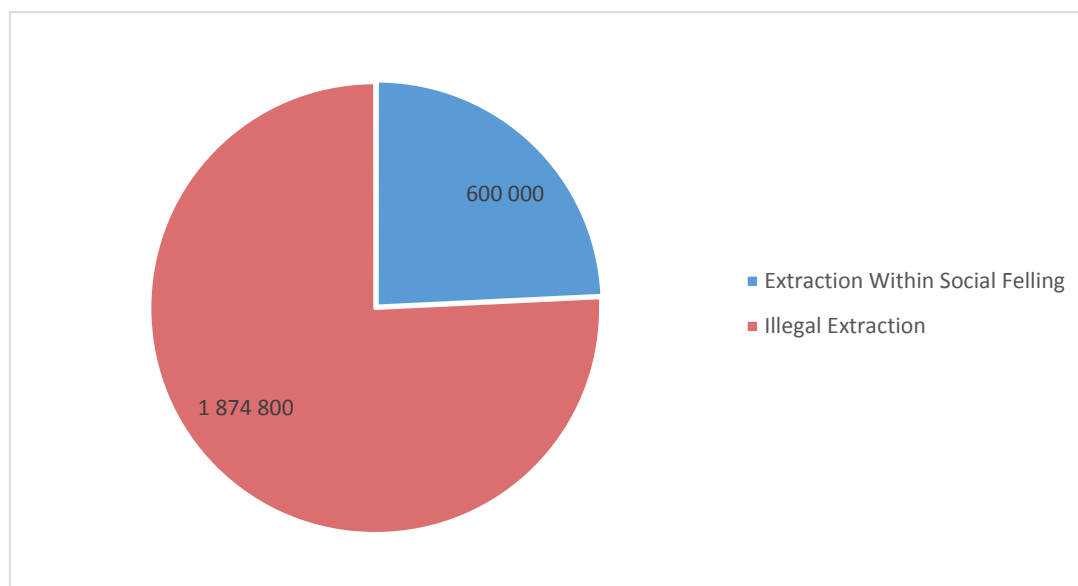
<sup>21</sup> including Adjara and protected areas

<sup>22</sup> USAID, *Domestic industries energy consumption in Georgia, 2014*.

<sup>23</sup> CENN, *estimation of the opportunity of reduction of dependence on firewood, 2015*.

600,000 m<sup>3</sup><sup>24</sup> wood is used, it appears that consumption of the resource exceeds the official allocation for 4 times. The difference between firewood supply and consumption (1.800.000 m<sup>3</sup>) indicates to the deficit of the resource allocated by the responsible entity, which is covered by the population by means of the illegal actions.

**Table 3.2:** Resource used in social felling and obtained through illegal actions



Comparison of the number of households registered in the wood management electronic base indicates the significant deficit of the firewood resource existing in the social sector of the timber resource use. In the electronic database, as of 2015, there are 715,327 households registered. Since each household can receive 7m<sup>3</sup> resource, it is possible to meet only 10-15% of the demand of the registered households with the resource allocated by the managing units (700,000m<sup>3</sup>).

**Table 3.3:** Registered and participating households

Year	2014	2015
number of participating households	93,242	93,885
registered households	702,185	715,327
<b>participating households %</b>	<b>13%</b>	<b>13%</b>

According to NGOs researches, in winter season, due to the migration of the rural population to the cities, the number of households registered in the social tree felling base is reduced. Based on the same survey, the number of firewood depending households in the regions for the winter season has been identified, thus their number has been reduced to 419,328<sup>24</sup>. The resource allocated by the forestry agency to meet the firewood demand of 419,328 households is still insufficient.

<sup>24</sup> Firewood dependent households – not consuming gas and other heating means in winter.  
CENN, estimation of the supply and demand on the firewood and the potential, 2016.

The Ministry assumes the responsibility only for the population engaged in the social felling activities, which is 25% (419,328) of the firewood dependent households, the remaining 75% has to address the illegal market to purchase the firewood.

In order to investigate the intensity of the demand on firewood resource under the social felling activities, the audit group has held the telephone inquiry with five regional bank branches authorized to issue the wood processing ticket (Bolnisi, Dmanisi, Gurjaani, Sagarejo, Mtskheta). The operators of the bank confirmed that the number of persons willing to obtain the tickets is higher than the amount of resource and whoever comes the first gets the tickets.

Taking into consideration the problems existing in the social sector of wood resource utilization, in order to preserve the wood resource and downsize the damage, the Ministry should exercise effective measures. These measures are discussed in the following sub-chapters.

### **3.1 Social felling is not sustainable – forest impact cannot be assessed**

According to sustainable and uninterrupted usage principles, in order to prevent forest degradation, it is necessary to establish the balance between the resource obtainment and the natural grow of the forest.<sup>25</sup> In case the annual obtainment of the resource exceeds the annual grow of the forest, the forest shall have the decreasing trend.

For preserving the forest, it is necessary to determine the optimal amount of timber to be extracted annually, which should not exceed the annual natural grow of the forest fund. For determining the optimal amount, the managing entity should have the data on the potential of the forest resource. Based on this information, the amount of the wood resource should be identified, which can be produced following the sustainable forest management principles. After identifying the optimally usable amounts of the resource, the demand on the wood resource should be determined. In case of the shortage between the optimal amount and the demand of the population, it is necessary to exercise effective measures aimed at reducing the deficit.

The audit group has requested information from the Ministry to estimate the sustainability of the social felling. The Ministry failed to produce information justification, due to which the grounds of the following data is not clear:

- › Amount of resource to be allocated to each household (7m<sup>3</sup>, 15m<sup>3</sup>);
- › Optimal amount of the resource allocated annually;
- › Actual demand of population on firewood.

The Ministry has not held the survey as to how much m<sup>3</sup> firewood is necessary for the population annually and what is the demand per each region. Also, the management unit cannot justify the grounds for determining 7m<sup>3</sup> firewood for a household and 15m<sup>3</sup> for the mountainous regions.

NFA failed to justify the principle under which the wood is annually allocated in the scope of the social felling activities and whether this equals to the annually usable optimal amount. Optimal

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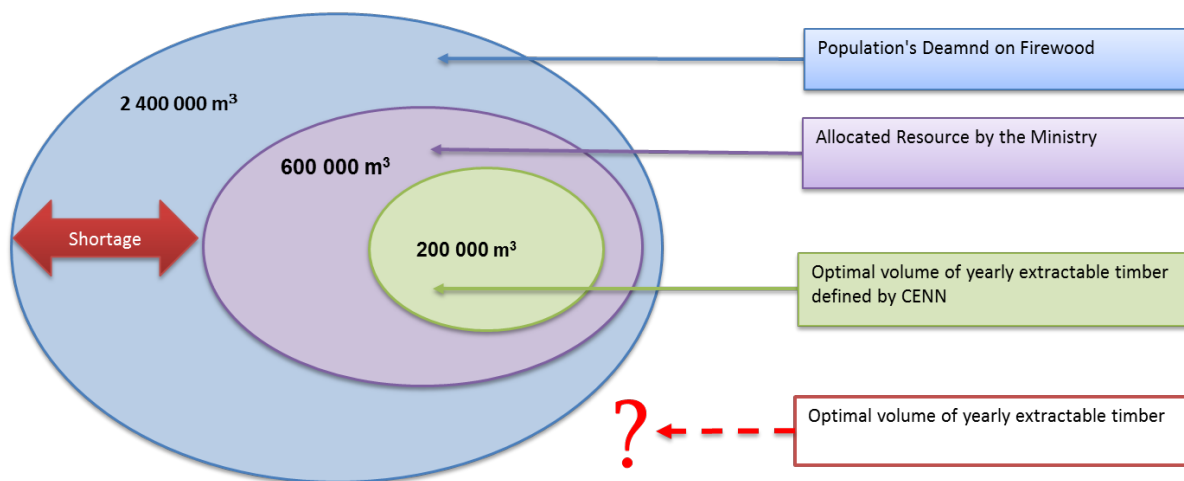
<sup>25</sup> Sustainable management principle.

amount of annual extractable timber is calculated by the formula. The managing unit does not possess the data necessary for calculating optimal amount of annually extractable resource, since the forest inventory has not been held for over 20 years. Consequently, the foresters determine the permitted tree felling area based on actual inspections.

*The Ministry allocates resource under the social felling activities without having accurate and exhaustive information necessary for the sustainable management of the forest due to which it is impossible to estimate both impact of the social felling to the forest preservation and its negative impact on the environment.*

CENN, on the basis of the latest forest arrangement data analysis (1998-2000), has established that optimal amount of the timber resource to be annually obtained is less than 200,000m<sup>3</sup>. At this stage, the Ministry does not have the official position on optimal volume of the annually extractable resource.

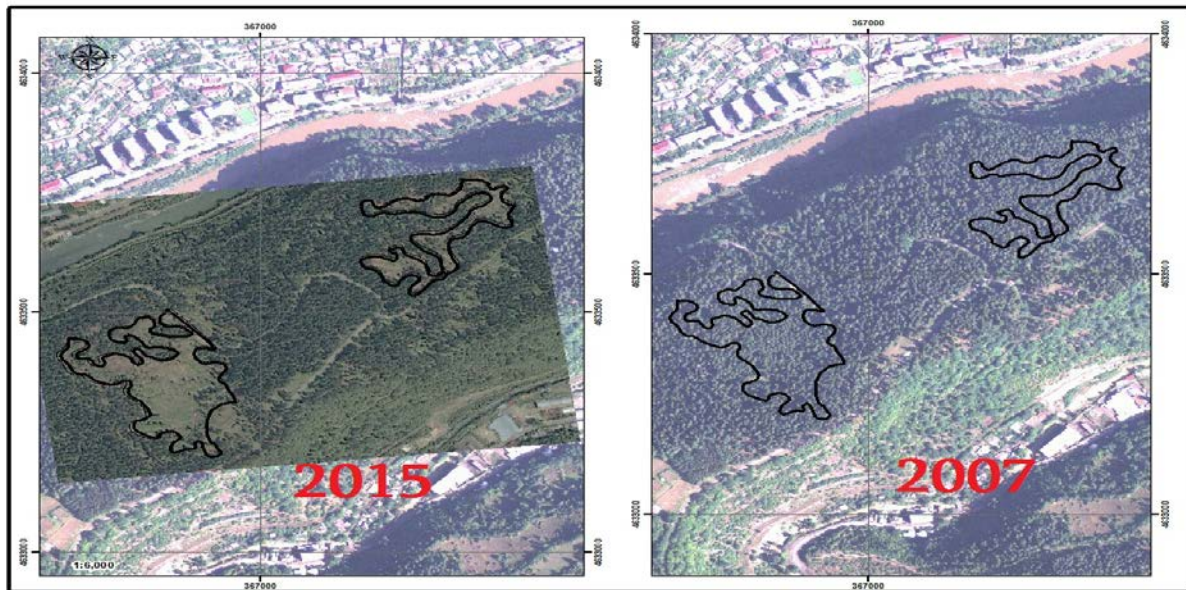
**Scheme 3.1.1:** Amount of the shortage and optimal volume of yearly extractable timber



In 2014, Borjomi-Bakuriani forest inventory has been finalized, after which the annual use norm – 38,000 m<sup>3</sup> has been established. It was also established that since 1998 until 2015, in this region, the forest timber resource (10.1 million m<sup>3</sup>) has been reduced by 1.8 million m<sup>3</sup>, i.e. 17%<sup>26</sup>. This example clearly demonstrates the negative impact of the unsustainable usage of the forest, in particular, significant reduction of forest resources and impossibility to preserve the forest. Accordingly, in the given region, the forest usage should not exceed the annual optimal amount established as a result of the inventory. Picture 3.1.2 demonstrates reduction of the forests near Borjomi from 2007 until 2015 as a result of illegal felling.

<sup>26</sup> This data does not include the area devastated as a result of fire in 2008, which covers 918 ha



**Picture 3.1.2:** Degraded forest area near Borjomi as a result of illegal tree felling

### Acknowledgement of the Social Problem and Establishing the Legal Framework of the Social Forest Usage

The timber resource deficit in the sector of its social use and the illegal market complicates achievement of the sustainable management of the forest and enforcement of the due measures for forest preservation. Accordingly, it is important that the Ministry undertakes effective measures to reduce the illegal markets. By determining the actual need of population on firewood and maximally meeting such demand, it is possible to significantly restrict the illegal market scales.

The Ministry does not share the indicated position regarding restriction of the illegal trading with the timber resources, which envisages that the demand on the firewood is met maximally legally. According to the Ministry, facilitating legalization of the existing wood consumption contradicts to the principles of the sustainable management and the goals of the Ministry. In the opinion of the Ministry, as a result of the inventory annual norm of timber resource extraction should be established and the timber processing/supply should be performed according to the indicated amounts. For solution of the social problem of forest usage, it is necessary to increase the role of other government entities, so that the Ministry of the Environment shall not remain as the sole responsible entity in the process of regulation of the problem of high importance.

At the initial stage, meeting the real demand of population on firewood legally may be contradicting the sustainable management principles, however, taking into consideration that the population anyway obtains the firewood illegally or purchases it, this measure will allow the Ministry to get the clear picture of the real situation existing in the social sector and also to restrict so called “black market”. Consequently, the Ministry, based on the actual data, may better plan the activities aimed at achievement of the sustainable management.

It is notable that the actual consumption of firewood by population remains unchanged in case the demand is met legally, accordingly, the possibility of infringing the principles of the sustainable management still remains the same as it is in terms of actual current consumption of the resource. Thus, it is important that the Ministry ensures that the demand of population is legally met, which will restrict illegal market in a short term. Otherwise, even after establishing the annual norm of timber resource consumption, provided that the illegal market remains, the sustainable management of the forest on behalf of the Ministry will be purely formal.

Parallel to maximal satisfaction of the real demand, it is important that the Ministry, with participation of the other government entities, makes efforts to reduce dependence of population of firewood by means of developing alternative sources of the energy. For ensuring sustainability in the forestry sector, it is necessary to engage responsible public entities and make joint efforts to solve the social forest usage problem.

### **Establishment of the state enterprise in the forestry sector**

According to the new forestry code, adoption of which is planned in the nearest future, the forest management<sup>27</sup> will be exercised by 100% state owned enterprise which will be authorized to produce and sell timber and firewood resources.

According to the international practice, along with the other criteria the following circumstances can be deemed as the basis for establishing the state enterprise:

- › The necessity to provide such goods/services, **the demand on which** is high and there is **the expectation of the public** that it will **be funded by the state**, and there is a risk that the supply cannot be adequately ensured only by the entrepreneurial entities;
- › The fear that **the private entrepreneurs** shall produce excessively such goods and services which have **a negative external effect** (for example impact to the environment).<sup>28</sup>

According to the criteria provided above and the social situation existing in the timber resource utilization system, establishment of the state enterprise shall facilitate sustainable use of the resource provided that the illegal market is significantly restricted. Parallel to legally produced and sold firewood resource by the state enterprise, it is not allowed to have illegal market for illegally obtained resource in place. It is important that the said enterprise, together with the private sector, ensures legitimacy and sustainability of timber resource production in the country.

### **Conclusion:**

Based on the foregoing, the social felling system in its current form cannot solve the firewood deficit problem. Due to the shortcomings existing in the system, illegal usage of forest and illegally obtained resource trading are encouraged. Taking into consideration existing social problem, to ensure sustainability of the system it is necessary to make due reaction to the issue of deficit in the social

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<sup>27</sup> forests other than in the protected territories and Adjara AR territories

<sup>28</sup> The Corporate Governance of Commercial State Owned Enterprises of Ireland, Dublin 2009, p. 12; OECD, Corporate Governance of State-Owned Enterprises: A Survey of OECD Countries, Paris 2005, pp. 20–1.

sector. In this respect, it is important that the Ministry to identify the amount of needed resource as possible. By meeting real demand maximally productively and effectively, it will be possible to plan and gradually enforce measures necessary for achievement of the sustainability of the system.

#### **Recommendations:**

#### **To the LEPL – National Forestry Agency of the Ministry of Environment and Natural Resources Protection:**

- › For the purpose to ensure sustainability of the timber resource usage in the social sector and plan measures necessary for maintaining the resource, it is important that the Ministry and the National Forestry Agency determine annual norm – amount of the resource, considering which, timber use will not cause forest fund reduction.

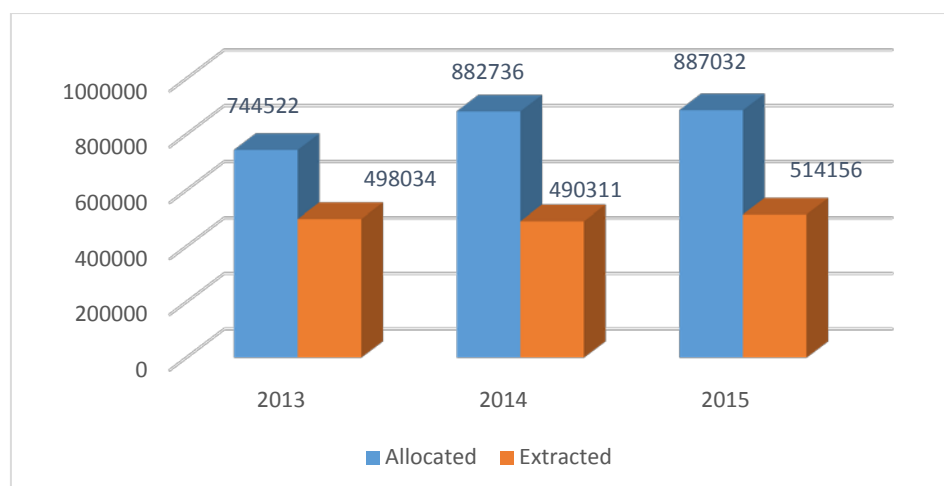
#### **To the Ministry of Environment and Natural Resources Protection:**

- › To identify the firewood resource deficit in the social sector and plan respective measures for its reduction it is important that the Ministry determines the real demand of population on firewood resource at the regional and municipal level.
- › For the purpose to restrict illegal trading and achieve sustainable management of the forest, the Ministry should ensure maximally legal satisfaction of the demand, taking into account the deficit existing at the regional and municipal levels. In the parallel regime, the Ministry, together with the other public entities (Ministry of Energy, Ministry of Agriculture, Ministry of Education, Ministry of Finance, Ministry of Economy), should initiate and incorporate other measures aimed at reducing the firewood deficit, so that the social tree felling gradually reduces and becomes compatible with the annual sustainable norm of usage.

### **3.2 Underutilized resources in the felling areas**

According to the forest usage rule, in the areas allocated for tree felling, where the resource is not utilized or is underutilized, after expiry of 2 years, such area is revoked. Different from revoking, according to the forest usage rule, the allocated areas are closed where no violations are identified, the resources are fully utilized and the forest use is conducted according to the established norms.

National Forestry Agency in 2013-2015 allocated 8,677 felling areas – with 1,702,122 m<sup>3</sup> firewood resource. Despite the wood deficit existing in the country, the resources existing in the allocated areas are not fully utilized. The table 3.2.1 provides comparison of the resource allocated by the agency and the utilized resource.

**Table 3.2.1:** Amount of resource allocated by the agency and the utilized amounts in 2013-2015

In 2013-2015, averagely 40% of the resource existing for utilization remained unutilized.<sup>29</sup>

Despite the firewood deficit existing in the country, underutilization of the significant part of the resource indicates to the shortcomings existing in the social tree felling activities. In particular there are frequent cases when due to absence of the access roads the resources are not utilized and accordingly the allocated areas are cancelled after expiry of 2 year term. The audit group has selected 45 cancelled allocated areas to investigate the problem of underutilization, out of which in 32 cases 0% of the resource and in the other 13 cases from 2% to 8% were utilized.

**Table 3.2.2:** Data on cancelled tree felling areas 2013 – 2015.

	Felling areas with 0% of resource utilization	Felling areas with 2-8% of resource utilization	Total	Felling areas cancelled due to absence of the access road	Felling areas cancelled due to non-utilization	Other violations	Total
Number of felling areas	32	13	46	11	27	8	46
Volume of the resource (m3)	9,335	3,456	12,791	4,064	5,677	3,050	12,971

The table above indicates that access to 4,064m<sup>3</sup> resource was restricted due to absence of the access road. Thereby, 27 underutilized cancelled felling areas indicate to the problems with the access roads, since out of 69 purchased forest usage tickets in mentioned felling areas, 42 users did not extract the resource.

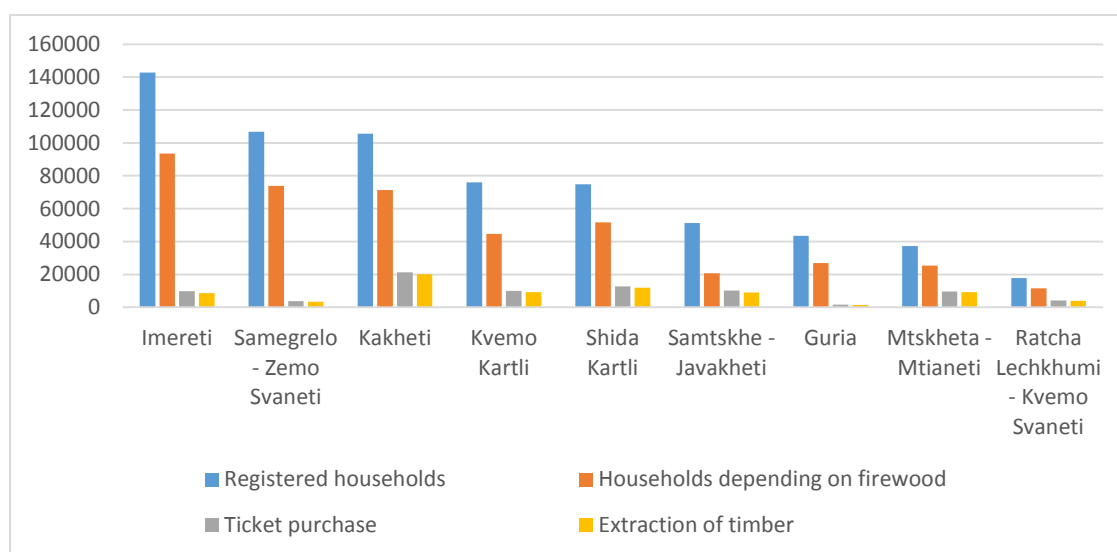
<sup>29</sup> The volume of resource provided in the table is obtained as a result of the volume allocated by the agency plus the balance of the resource remaining during the previous years.

Out of 46 allocated felling areas selected by the audit group, only 118 tickets were purchased, out of which 87 users did not use the ticket. There is a high probability that this is indicative of the difficult accessibility of the allocated area.

It is noteworthy that in 2013-2015, out of the forest areas allocated by the agency, only 244 (2%) have been closed, and 873 (10%) has been cancelled, out of which bulk of the entire resource (189 000m<sup>3</sup>) has not been used (45 000 m<sup>3</sup>).

In addition to the difficult access and lack of roads, the reasons of non-utilization of resources allocated by the agency are: difficult geographic-climatic conditions, less engagement of population in the social tree felling activities and the differences of the supply and demand per regions. Table 3.2.3 shows the indicators of participation in the social tree felling in the regions. Household involvement indicators as compared with the registered households is quite less and varies from 3% to 25% per regions. Taking into consideration the numbers revised by the NGO on firewood dependent households, the involvement data increases from 6% to 44%. The highest involvement is observed in Mtskheta-Mtianeti, Kakheti, Racha-Lechkhumi, Shida Kartli and Kvemo Kartli regions, less in Guria, Samegrelo-Zemo Svaneti and Imereti.

**Schedule 3.2.3:** Firewood dependant, registered and participating households as of 2015



The audit group, for the purpose to analyze the reason of non-utilization, compared the data of regions distinguished by the high and low activities in the social felling (see table 3.2.4). In Kakheti and Samegrelo-Zemo Svaneti, despite the almost equal number of firewood dependent households, the indicators of participation of the population in the social tree felling activities are different, for example, in Kakheti 20,020 households participated in the felling, in Samegrelo-Zemo Svaneti – just 3,344. Correspondingly, the share of the utilized resource in Samegrelo-Zemo Svaneti is low – 52%, in Kakheti the same indicator equals to 80%.

This fact can be explained by the surplus forest resource in the given regions, in Samegrelo-Zemo Svaneti there are more forest resources, in Kakheti due to lack of the resource the indicators of participation in the social tree felling activities and resource utilization is higher.

**Table 3.2.4:** Utilization of resources and engagement of population per regions

Region	Allocated resource <sup>30</sup>	Utilized resource		Firewood dependent households	Households participating in the social felling activities (2015)	
		∂ <sup>3</sup>	%		∂ <sup>3</sup>	%
<b>Mtskheta-Mtianeti</b>	134,683	100,019	74%	25,372	9,138	36%
<b>Samtskhe-Javakheti</b>	160,04	128,843	81%	20,667	9,099	44%
<b>Kakheti</b>	65,483	213,493	80%	71,257	20,020	28%
<b>Samegrelo-Zemo Svaneti</b>	54,989	28,850	52%	73,800	3,344	5%
<b>Guria</b>	18,443	13,877	75%	26,854	1,425	5%
<b>Imereti</b>	131,526	106,641	81%	93,488	8,594	9%

Non utilization of the resource allocated by the National Forestry Agency negatively affects the forest conditions. The population is less involved in the social felling and consumes illegally obtained resource without observing the forest usage rule which brings significant harm to the forest and the environment. In 2013-2015, the facts of illegal forest usage identified by the agency incurred GEL 12,788,000 worth damage to the environment.

#### Conclusion:

Difficult access to the allocated forest area, lack of roads and low involvement of the population in the social tree felling activities incurs underutilization of the resource. Thereby, taking into consideration that the demand and consumption of population exceeds firewood supply, non-utilization of the resource in the social felling activities represents the significant problem. Due to this problem, the Ministry fails to increase participation of the population in the social tree felling. Despite the unused resource, the population by bypassing the social tree felling obtains and consumes illegally cut wood resource.

<sup>30</sup> This column reflects the allocated forest cutting areas for 2013 and 2014, for better demonstration of the development trend.

**Recommendations:**

**To LLEPL – National Forestry Agency:**

- › For the purpose to raise the participation of population in the social felling, NFA, by better planning of the access roads to the allocated forest felling areas, should improve the firewood resource availability and facilitate usage of the resource at the allocated areas.

**To the Ministry of Environment and Natural Resources Protection:**

- › In the regions where the participation of the population in the social tree felling activities is low, for the purpose to increase the participation indicator and the legal usage of the resource, the Ministry should study the imbalance between the demand and supply of the resource and on the basis of the real information undertake necessary measures to regulate demand and supply.



## 4. Potential of Reducing the Firewood Deficit

### 4.1 Consumption of firewood in the public entities – potential of reduction and the resource of illegal origin

For the purpose to reduce the firewood deficit and accordingly reduce the harmful impact on the environment it is important that the public entities reduce the firewood consumption. In 2013-2015, the timber resource utilized by the public entities comprised 118,739 m<sup>3</sup>. Annually, firewood consumption at the public institutions equals to average 40,000 m<sup>3</sup> which is 6-8% of the resource officially used under the social felling activities.

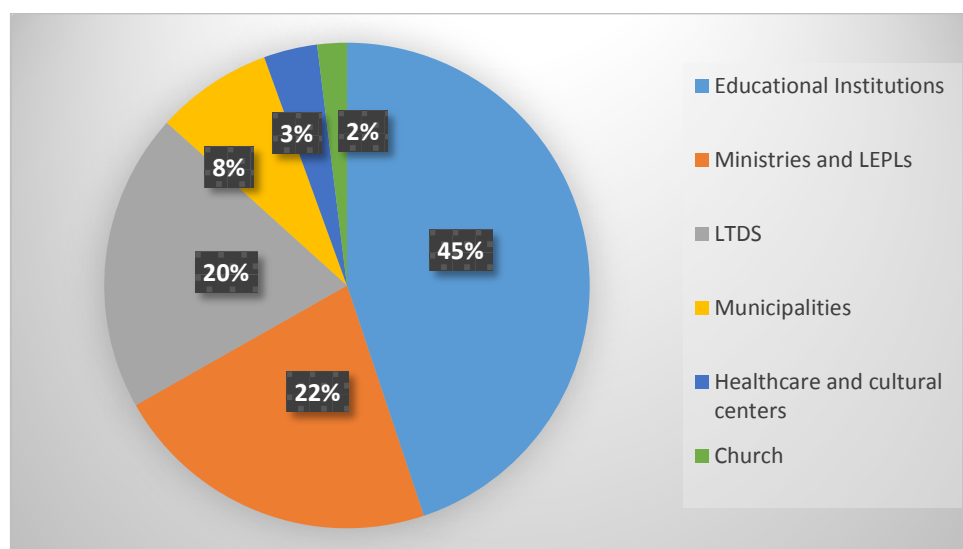
The Agency for Protected Territories is the exception in terms of firewood utilization for public sector, the firewood resource is allocated in its subordinated territories only for the personal consumption of the local population.

Firewood consuming budget organizations are divided into the following groups:

- › Educational establishments;
- › LEPLs of the Ministry of Defense and Ministry of Internal Affairs;
- › Local self-governing entities.

In 2013-2015, bulk of firewood was consumed by the educational establishments (45%) and the LEPLs of the Ministry of Internal Affairs (22%). Due to the firewood deficit existing in the country, it is important to reduce the firewood consumption at these objects.

**Table: 4.1.1:** Consumption of the resource by the budget organizations in 2013-2015 <sup>31</sup>



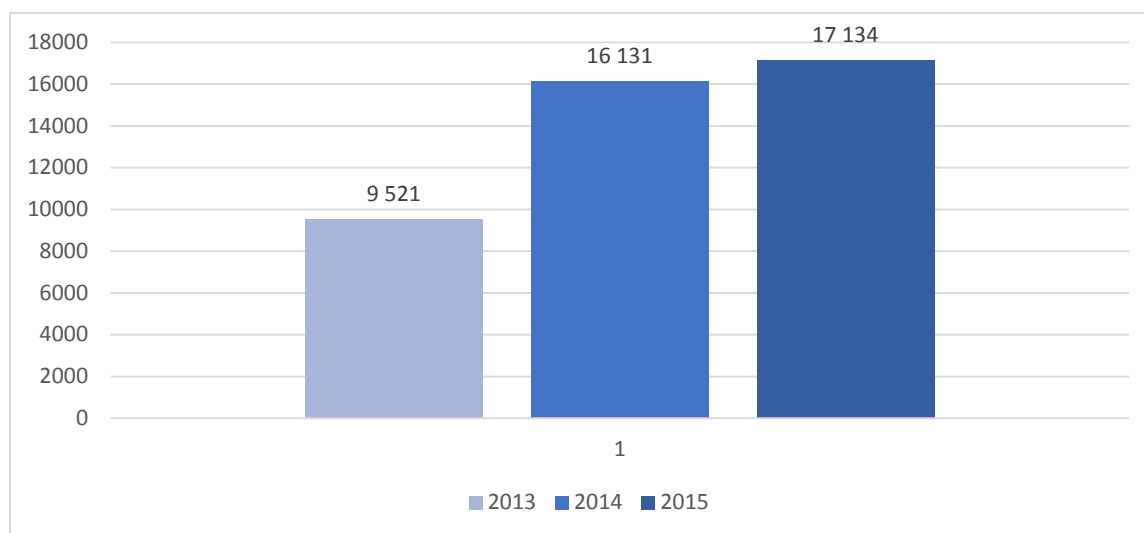
Educational establishments which consume 45% of the resource include kindergartens, public and arts schools<sup>32</sup>. Out of 792 educational establishments – 715 are schools. Since the schools in the

<sup>31</sup> Source: NFA.

<sup>32</sup> Music, arts and sports schools

public sector consume most of the resource, the further analysis of the audit group is based on the study of the firewood consumption data at the public schools only. Out of the 1763 public schools in the regions<sup>33</sup>, 715 participate in the social felling and for one calendar year on average consume 60 m<sup>3</sup> firewood. In 2013-2015, consumption of the firewood at the educational establishments has the growing trend.

**Table 4.1.2:** Consumption of firewood at public schools 2013-2015 (m<sup>3</sup>)<sup>34</sup>



Consumption of firewood at public schools per regions is different. The highest firewood consumption is recorded in Samtskhe-Javakheti and Kakheti, less in Samegrelo and Zemo Svaneti. The underlying reason can be attributed to the climate in the given regions, the number of pupils at schools or lower engagement of schools in social tree felling activities. For example, out of 264 schools of Samegrelo Zemo Svaneti, only 34 schools – 13% participate in the social tree felling activities. (See table 4.1.3).

<sup>33</sup> with exception of Tbilisi, Adjarian and Abkhazian schools. Geostat, data of 2014-2015

<sup>34</sup> Source: NFA

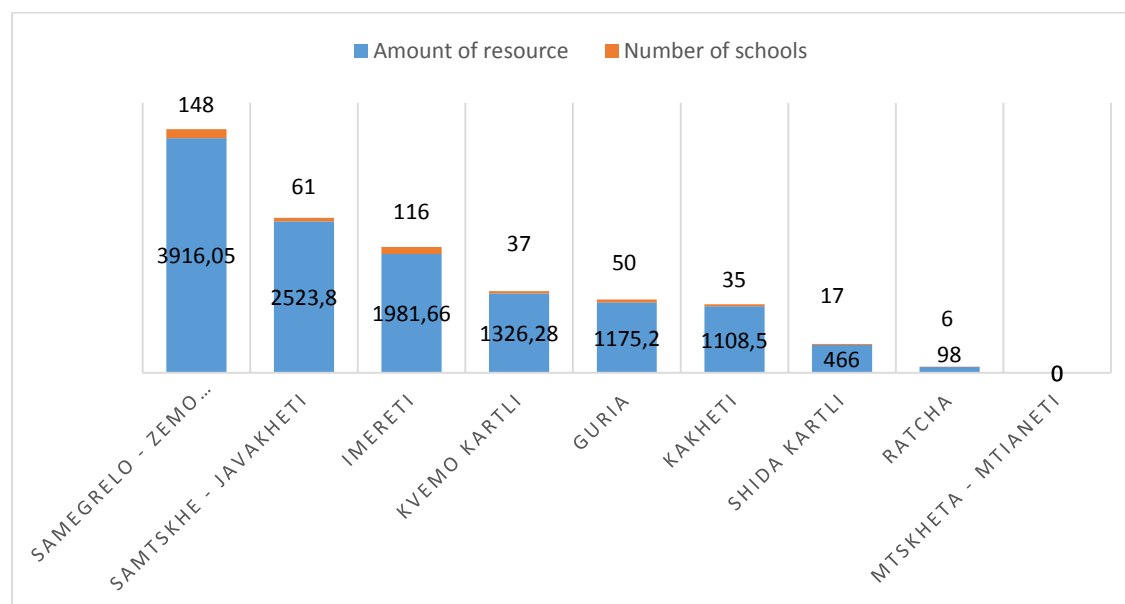
**Table 4.1.3:** Schools participating in the social tree felling program and gasified schools 2013-2015

Region	Schools	Schools participating in the social felling	Total consumption of Schools participating in the social felling 2013 -2015 (m <sup>3</sup> )	Number of gasified schools participating in the social tree felling program	Total consumption of gasified schools participating in the social tree felling program 2013-2015 (m <sup>3</sup> )
Racha Lechkhumi Kvelo Svaneti	68	53	2,356	1	44
Kakheti	194	116	7,967	80	571
Mtskheta Mtianeti	88	54	6,796	19	2,474
Samtskhe Javakheti	206	106	8,557	36	2,857
Shida Kartli	172	85	3,270	52	1,864
Imereti	401	150	6,215	62	2,030
Guria	101	35	1,631	6	161
Kvemo Kartli	269	82	4,441	43	2,688
Samegrelo-Zemo Svaneti	264	34	1,459	0	0
<b>Total:</b>	<b>1,763</b>	<b>715</b>	<b>42,692</b>	<b>299</b>	<b>17,832</b>

Analysis of the schools participating in the social felling revealed that 42% of schools participating in the program are gasified, nevertheless, they use firewood for heating. Kakheti region is one of the most active firewood consumers, although 69% of Kakhetian schools participating in the social tree felling activities are gasified. Also, as seen from the table below, Svaneti, which is not gasified region is not actively engaged in social felling program.

Due to above indicated, the audit group was interested in the heating means of those schools which are not participating in the social felling activities.<sup>35</sup> For this purpose, the analysis of schools not participating in the social tree felling activities was held, as a result of which it was revealed that additionally 450 schools consume firewood and in 2015 consumption of the resource comprised 12,595 m<sup>3</sup>. In total, out of 1,763 schools in regions of Georgia, 1,185 – 67% uses firewood for heating and the resource used in 2015 comprises 29,729 m<sup>3</sup>.

<sup>35</sup> Special attention was paid to the schools not participating in the social tree felling activities and does not belong to the gasified settlement.

**Table 4.1.4:** Number of schools not participating in the social felling and the amount of wood resource used per regions<sup>36</sup>

Different from table 4.1.3, the scheme above shows that Samegrelo Zemo Svaneti region which does not participate in the social tree felling program is an active firewood consumer.

For the schools not participating in the social tree felling, the only way to legally obtain firewood is through the timber production license holders, who produced only 6,700m<sup>3</sup> of the resource in 2015. The amount of firewood resource produced by the licensees is twice less than the consumption of schools not participating in the social felling.

1. Thus, the origin of the firewood consumed by the schools not participating in the social felling activities is illegal and the state funded public schools are purchasing/consuming illegally obtained resource.
2. There is a potential of firewood consumption reduction at public schools – by means of substituting firewood consumption with gas at gasified schools and determining rational amount of firewood consumption at non gasified schools (see chapter 4.2. on determining rational amounts).

The expenses of heating for public schools is allocated by the Ministry of Education. Analysis of the energy sources consumed by the public schools of Georgia revealed that average financial expenses for natural gas and firewood for schools is approximated. At schools where the firewood is the sole means of heating, averagely from 15 to 130m<sup>3</sup> firewood is consumed, at schools where the sole means of heating is the natural gas – averagely from 2500m<sup>3</sup> to 25000m<sup>3</sup>. The data on expenses is reflected in table 4.1.5. Accordingly, substitution of the natural gas with the firewood shall not incur significant increase of expenses.

<sup>36</sup> Source: Ministry of Education

**Table 4.1.5:** Comparison of the natural gas and firewood expenses at public schools

Natural gas			Firewood		
Number of schools	Average resource consumption (m <sup>3</sup> )	Expense of one school (GEL)	Number of schools	Averagely consumed resource (m <sup>3</sup> )	Expense of one school (GEL) <sup>37</sup>
37	25,000	15,000	9	130	11,050
54	15,000	9,000	75	60	5,100
110	10,000	6,000	355	40	3,400
136	6,000	3,600	247	25	2,125
26	2,500	1,500	386	15	1,275

As for the public schools which do not participate in the social felling activities, but use illegally obtained firewood, facilitate development of “black market” in the sector of social use of wood described in the present sub-chapters.

### Conclusion:

In order to reduce the firewood deficit, it is important to reduce the firewood consumption at the public sector. Most of public schools, among them at the gasified settlements, use firewood for heating. Also, there were some schools identified which consume firewood without participation in the social tree felling activities. At these schools, consumed firewood is of illegal origin. With respective measures, it is possible to reduce the firewood consumption at the public schools, in particular, by means of substituting firewood with natural gas at the gasified schools. Also, by engaging schools, using firewood of illegal origin, into the social felling program “black market” of illegal firewood trading will be significantly restricted.

<sup>37</sup> expenses are obtained by using following data: cost of 1m<sup>3</sup> natural gas – 0.6 GEL, average cost of 1m<sup>3</sup> firewood production and transportation per regions – 85GEL (CENN, *Current situation of forest management and its impact on the population, 2013*).

**Recommendations:****To the Ministry of Environment and Natural Resources Protection**

- › For the purpose to reduce the deficit of the firewood the Ministry with participation of the responsible public entities (Ministry of Energy, Ministry of Education and Science) should initiate gradual substitution of the firewood consumption at the gasified schools with the natural gas, also, the Ministry should identify gasified establishments, which consume firewood and together with the responsible entities (Ministry of Defense, Ministry of Internal Affairs, Ministry of Education and local municipalities) initiate gradual substitution of the firewood consumption at these establishments with the natural gas.
- › For the purpose to restrict illegal production of wood resource and selling in the public sector, the Ministry together with respective government entities, should gradually reduce utilization of illegally produced firewood in the public sector and ensure consumption of legally obtained firewood.

**4.2 Unjustified Request of Resource by the Public Sector**

According to the forest usage rule, justified request on issuance of the first and second category trees and also fallen trees to be allocated under the social felling activities is submitted by the budget organizations to the managing body, in particular, LEPLs, Non-commercial legal entities of the self-governing bodies.<sup>38</sup>

The budget organizations address the NFA on allocation of firewood resources. For instance, regional resource-centers of the Ministry of Education represent the request on firewood necessary for the public schools, the local self-governing bodies address the Agency to provide firewood for the kindergartens. Ministry of Internal Affairs, Ministry of Defense, Patriarchate of Georgia and budget noncommercial legal entities address also NFA for allocation of the firewood resource.

As a result of document analysis of 2014 – 2015 firewood resource requests, it was revealed that the budget organizations do not justify the need of the resource. The documents of request indicate only the title of the organization and the amount of requested resource. The justification of the need of the resource determined by the legislation does not take place.

The procedures according to which the budget organizations could submit justified request have not been developed at the Ministry. Accordingly, for the budget organizations it is unknown which criteria to follow when justifying the need on the resource.

Unjustified request of firewood resource in the public sector creates the unequal consumption trend and the risk of inefficient utilization. The audit group, in order to analyze the unequal consumption

<sup>38</sup> Resolution 242, Article 10, clause 9.

of the firewood resource at the public sector, reviewed the issue of firewood consumption by the public schools. Although schools are located in the same geographic area, consumption of the resource per one pupil is radically different. Table 4.2.1 shows unequal trend of resource consumption at the public school in the same municipality. Due to absence of the resource allocation justification procedure, consumption of the resources at the public schools is unequal.

**Table 4.2.1:** Comparison of the resource consumed in the municipalities and the number of pupils (2013 - 2015)

School code	Municipality	Number of pupils 2015-2016	Total resource	Resource per one pupil
242007430	Chokhatauri	87	32.5	0.37
242007519	Chokhatauri	25	32	1.28
242007494	Chokhatauri	12	55	4.58
239404113	Sachkhere	17	150	8.82
239403944	Sachkhere	15	50	3.33
224617449	Akhmeta	439	188	0.43
224628124	Akhmeta	624	144	0.23
229322177	Dusheti	61	270	4.43
229322220	Dusheti	62	87	1.40
242574763	Tsageri	100	35	0.35
242576002	Tsageri	14	35	2.50
235894476	Mestia	47	100	2.13
235894573	Mestia	131	49.5	0.38
222727967	Adigeni	197	105	0.53
222727976	Adigeni	17	105.92	6.23
228927506	Dmanisi	80	30	0.38
228927515	Dmanisi	186	30	0.16
232550799	Kaspi	9	38	4.22
232550673	Kaspi	227	41	0.18

The ministry meets the demand of the public schools without preliminary justification what creates the risk of irrational and inefficient consumption of firewood at schools. Schedule 4.1.3 shows that in some cases the regions with fewer schools and accordingly fewer pupils consume more resources than those regions with more schools and pupils. For instance, in 2013-2015, 150 schools of Imereti consumed 6200m<sup>3</sup> firewood while 116 schools of Kakheti consumed 7969m<sup>3</sup> for the same period.

#### Conclusion:

Unjustified request of the resource creates the risk that budget organizations consume forest wood resource inefficiently. Due to absence of the general procedures on justified request on the firewood resource it is impossible to establish rationality and expediency of the resource requested by the public sector. Audit Office believes that in case of presence of the established procedures, it will be possible to optimize timber resource utilization in the public sector, what on the other hand, shall reduce the amount of the consumed resource and reduce the negative impact on the forest.



As a result of study of the firewood consumption at the public schools by the audit group, certain shortcomings were identified which increase the risks of inefficient and irrational use of the resource in the remaining part of the public sector.

**Recommendation:**

**To the Ministry of Environment and Natural Resources Protection**

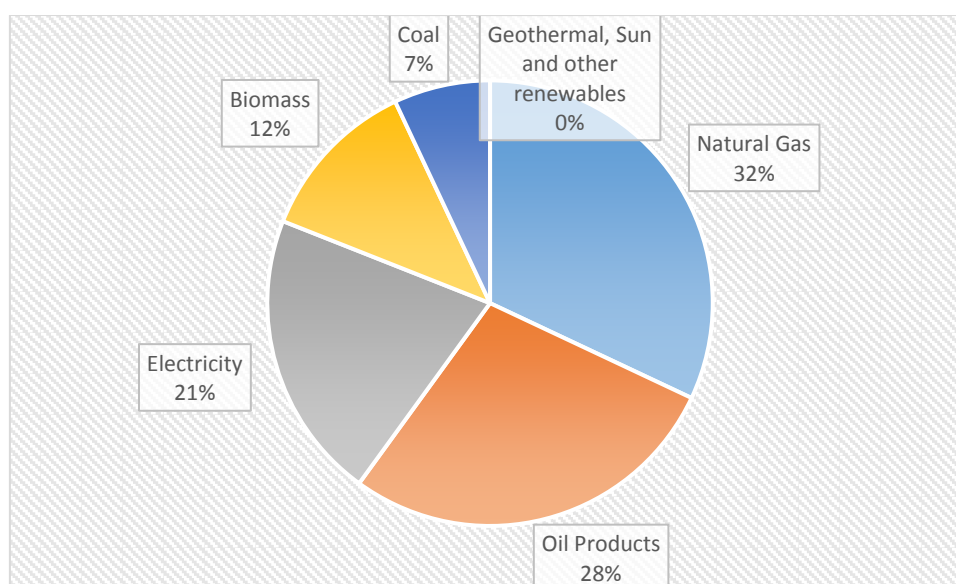
- › For the purpose to optimize the firewood consumption at the public sector and prevent inefficient/irrational use, the Ministry should develop the resource request justification procedures for the public sector and with the random selection principle conduct checkup of reasonable utilization of the requested resource.

### 4.3 Factors Precluding Utilization of the Residue Bio Mass Potential

There is a significant potential of utilization of the residue biomass for energy purposes in Georgia. Development of the residue biomass sector shall facilitate reduction of dependence on firewood resources, shall have a positive impact on the economy of the country – by creating new local businesses and jobs. For the purpose to attract the interest of the business to the residue biomass, it is important that availability/supply of the biomass be stable/systematic and the Ministry possesses reliable data on potential of the residue biomass.

In the energy balance of Georgia, bio mass occupies 12% which means that the biomass represents the significant source of energy. 99% of the biomass accounts for the firewood. The remaining 1% is for the recycled products of the residue biomass.

**Schedule 4.3.1:** Energy Balance of Georgia in 2014



There is a good practice of using residue biomass for heating purposes in Slovakia. Forest covered area of Slovakia (2,012,414 ha<sup>39</sup>) is approximated to Georgia (2,822,400 ha). Collection of the bio mass remnants in Slovakia is done in riverbeds, along the power lines and roads, which creates about 1000 000 tons of remnants during the year. The table below 4.3.2 shows the practice of replacing the natural gas with the bio mass in one of the regions of Slovakia. In case of Georgia it is possible to reduce the firewood dependence by using bio mass remaining products.

**Table 4.3.2:** The practice of substituting the natural gas with the bio mass in Slovakia

Year	2004	2011
Consumption of the natural gas (m <sup>3</sup> )	7 500 000	0
Biomass consumption (tons)	0	23 000
heat mWt/hr	63 000	63 000
Annual electricity	0 mWt/hr	17 000 mWt/hr
CO2 emissions (tons)	14 500	0

Up to now According to the existing vision, key alternative for substitution of the firewood in Georgia is the natural gas. 26% of the regions are not supplied with the natural gas, the gasification, on the other hand is the lengthy process and is related to significant infrastructural expenses. The audit group compared the dynamics of firewood consumption at gasified and non-gasified municipalities and established that at the gasified settlements population continues to consume the firewood. In particular, the audit group compared the indicator of participation of households in the social felling activities at Tianeti and Telavi municipalities (cities and villages), as the analysis showed both municipalities consume firewood.

**Table 4.3.3:** Participation in the social tree felling activities at gasified and non gasified municipalities:

2015	Less gasified		Fully gasified	
	Village Tianeti	Tianeti Municipality	City of Telavi	Telavi Municipality
Number of population	2,850	6,618	19,629	38,721
Number of households	919	2,134	6,134	11,734
Number of households participating in the social felling activities	749	1,072	2,327	4,199
% of households participating in the social tree felling activities	81%	50%	38%	36%

Gasification does not substitute the demand on firewood, since the choice of the population depends on their purchasing power. Considering gasification as an alternative of the firewood is expedient only in the long term perspective, along with improvement of the economic conditions of

<sup>39</sup> Stefan Smerkovsky, *Slovak Experience Concerning Solid Biomass Use for Energy*, 2016.

the population. Consequently, reduction of demand on firewood is not anticipated until the population. As a result, until improvement of economic condition is not improved, reduction of firewood demand is not expected, therefore, for the purpose to reduce the impact on forests, it is necessary to substitute firewood with alternative means.

For the purpose to reduce the consumption of firewood in Georgia it is possible to recycle and utilize bio mass residue. According to the survey of bio mass potential, country wide, each year 70 peta - joule (PJ) natural gas is consumed, the annual potential of the residue biomass is 37.4 pj, which equals to the half of the annual natural gas import. Annual bio mass residue sources are agricultural industry residues (28.7 PJ) and forest production remnants (8.7 PJ).

The forest bio mass remnants are generated as a result of tree cutting, remnants left in the forests and the sawdust. There are officially registered 688 wood processing saw mills in Georgia. According to the research, in previous years, as a result of activities of the licensees, population, illegal cuts and saw mill operations, about **3,113,000 m<sup>3</sup>** forest byproducts have been accumulated, energy value of which is 31.3 PJ <sup>40</sup> (see table 4.3.4).

*In Georgia, there is a potential of using residue biomass for energy purposes, however there are no measures ongoing at the Ministry to facilitate the residue biomass utilization. In particular, the Ministry has not evaluated the potential of the biomass and does not possess necessary data for development of the production.*

This is caused by the circumstance that the Ministry does not conduct respective surveys to estimate the residue biomass potential. The resource of the residue biomass is scattered in the regions and their annual potential is not studied.

By producing bio mass remnants it is possible to reduce the impact on the forests and meet the energy demand of population (see table 4.3.4). It is noteworthy that bulk of agricultural residue is stable, by means of which it is possible to provide heating to the municipalities.

**Table 4.3.4:** Potential of meeting the energy demand of the firewood dependent households with the bio mass remnants

Residue biomass	Quantity (m <sup>3</sup> /tons)	Energy value (pj)	Number of households (thousands)	% of households
<b>Accumulated forest biomass</b>	3,113,000	31.3	508	71%
<b>Forest biomass annual potential</b>	1,161,000	8.7	141	20%
<b>Annual potential of agrarian residue</b>	1,508,329	28.7	467	65%

<sup>40</sup> WEG, UNDP, *Assessment of Wood and Agricultural Residue Biomass Energy Potential in Georgia*, June, 26, 2014.

To date the bulk of bio mass potential in the country is underutilized. Most of biomass residue in Georgia is either burnt or disposed. 90% of inquired persons confirmed that vine branches are immediately burnt after trimming.<sup>41</sup>

**Conclusion:**

On the basis of the researches by different organizations, it is revealed that in Georgia there is the potential of producing residue biomass which can be used to reduce the deficit on firewood resource in the country. Nevertheless, the Ministry does not pursue the policy necessary for development of the residue biomass sector development. Reliable and accurate information on annual potential of the resource is the prerequisite of development of the residue biomass sector development, which is not available at the Ministry to-date. Absence of such information hinders development of the sector and significant part of residue biomass resource cannot be utilized.

**Recommendation:****To the Ministry of Environment and Natural Resources Protection:**

- › For the purpose to utilize forests residue biomass energy potential, the Ministry, at the municipal level should study annual potential of the forests residue biomass and by using reliable information facilitate development of the residue biomass production sector.

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<sup>41</sup> WEG, UNDP, *Assessment of Wood and Agricultural Residue Biomass Energy Potential in Georgia*, November 28, 2014.

## 5. Non-Energy Efficient Use of Timber Resource

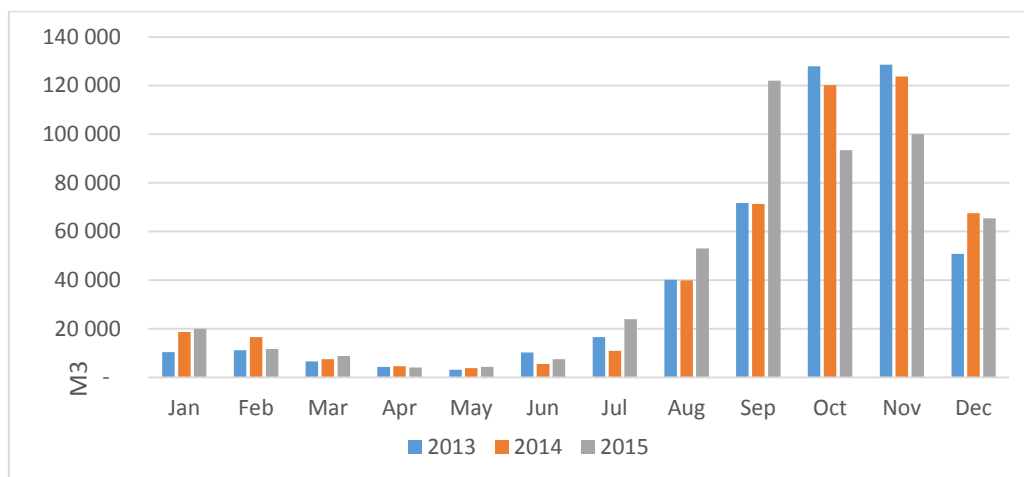
When using the wood resource for heating purposes, first of all the principle of sustainable energy source should be taken into account. For provision of the timber resource as a source of sustainable energy, first of all, it is necessary that the resource is obtained in terms of sustainable management, afterwards it is necessary to obtain maximal thermal energy out of the resource by raising the energy efficiency.

One of the ways of increasing energy efficiency of the firewood is its drying after the extraction. It is a common knowledge that newly cut wood contains water and without its sufficient drying maximal heat will not be received. After extraction, minimum 6-12 months are necessary for drying the firewood. After this term expires, water content is reduced in the wood resource and thus its thermal energy is augmented.<sup>42</sup>

To facilitate correct consumption of the firewood resource, various forestry organizations worldwide run population awareness raising campaigns. Forest managing bodies provide information on methods of correct utilization of firewood resources via internet and various media<sup>43</sup>

At the cutting areas allocated by the NFA, the population within 30 days after obtaining the firewood processing ticket, any time can extract and withdrawn the resource from the forest. To date, population extracts 77% of firewood resource each year from September to December period (see table 5.1 and 5.2).

**Schedule 5.1:** Amount of resource utilized under social felling activities per months



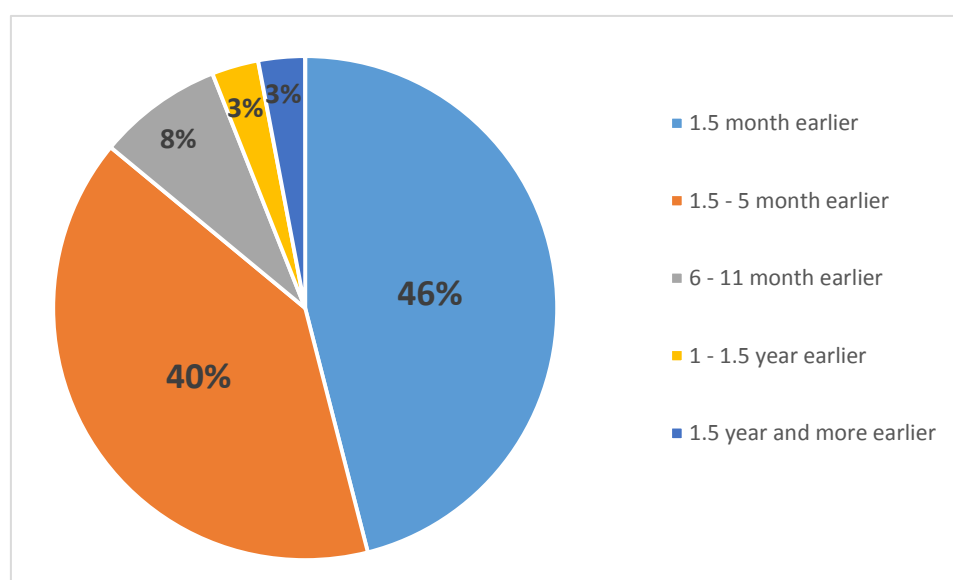
<sup>42</sup> Phil Potter, *Seasoning Wood for Fuel*, ხელმისაწვდომია: [http://www.forestry.gov.uk/pdf/eng-yh-seasoningwoodforfuel.pdf/\\$FILE/eng-yh-seasoningwoodforfuel.pdf](http://www.forestry.gov.uk/pdf/eng-yh-seasoningwoodforfuel.pdf/$FILE/eng-yh-seasoningwoodforfuel.pdf).

<sup>43</sup> Forestry Commission, *Wood as fuel a guide to choosing and drying logs*, 2009.

**Table 5.2:** Percentage of resource obtained during September – December

Year	Total of obtained firewood resource (m <sup>3</sup> )	Resource obtained in September – December period (m <sup>3</sup> )	Percentage of resource obtained in September – December period
2013	481,479	379,151	79%
2014	490,059	382,854	78%
2015	514,157	380,880	74%

According to the Household Energy End-Use Survey of 2013 it was established that the population consumes raw, not dry resource. In particular, out of the families inquired country wide (1081 households), 46% noted that firewood consumed by them was obtained 1.5 month ago, 40% stated that they got firewood 1.5-5 months ago (see diagram 2.3).

**Diagram 5.3:** Consumption of the raw firewood by population in 2013

*Based on the foregoing, firewood obtained under the social tree felling activities is consumed in non-energy efficient way.*

The forest managing bodies do not conduct resource planning measures, which should ensure raising energy efficiency in the course of firewood consumption. In particular, optimal terms for utilization are not defined, which would help population to use resource in the right period. Optimally determined utilization periods shall make it possible to establish minimal period necessary for sufficient drying of the firewood. As seen from the table 5.4, 75% of resource allocated in the scope of social tree felling activities is available in August – November period, since NFA opens most of the felling areas by this period.

**Table 5.4:** Resource existing the cutting areas opened in August – November

	2014	2015
<b>Total of allocated resource (m<sup>3</sup>)</b>	653,984	658,323
<b>Amount of resource at the cut areas in August – November (m<sup>3</sup>)</b>	503,950	490,144
<b>% of resource available in August – November</b>	77%	74%

After opening the felling area, the resource can be utilized for 2 years period, nevertheless, due to scarcity of the resource, the population utilizes the bulk of resource shortly after its availability. Table 5.5 and 5.6 demonstrates the amount of resource and utilization at the felling areas opened in the last 6 months of 2014-2015. The tables show that the population extracts the bulk of resource within 2-3 months after the opening of felling areas, accordingly, the resource utilized within this period is not sufficiently dry during the consumption.

**Table 5.5:** utilization of resource at the cutting areas opened in last 6 months of 2015

2015	Extraction in felling areas opened in December	Extraction in felling areas opened in November	Extraction in felling areas opened in October	Extraction in felling areas opened in September	Extraction in felling areas opened in August	Extraction in felling areas opened in July	Extraction in felling areas opened in June
Total Resource	35,842	56,161	83,556	157,065	193,362	91,884	24,333
Total Extraction	8,035	28,788	51,571	95,757	128,506	66,759	17,510
December	8,020	14,658	9,733	11,255	10,072	4,307	1,060
November		14,210	27,087	22,283	19,038	7,833	1,617
October			15,007	35,028	25,492	8,202	1,371
September				27,766	59,402	18,718	2,773
August					15,159	20,315	3,871
July						7,924	5,143
June							1,716

**Table 5.6:** utilization of resource at the cutting areas opened in last 6 months of 2014

2014	Extraction in felling areas opened in December	Extraction in felling areas opened in November	Extraction in felling areas opened in October	Extraction in felling areas opened in September	Extraction in felling areas opened in August	Extraction in felling areas opened in July	Extraction in felling areas opened in June
Total Resource	36,170	81,949	105,871	144,834	171,296	81,432	11,673
Total Extraction	9,253	42,101	69,655	96,665	109,924	50,895	6,623
December	9,280	21,856	9,811	8,772	9,574	3,602	168
November		20,372	38,315	25,190	22,682	7,605	1,029
October			21,798	45,776	29,498	11,448	1,812
September				17,420	34,284	11,120	945
August					14,290	13,814	1,251
July						3,514	1,045
June							384

Along with establishment of the period necessary for drying it is important that the Ministry conducts the awareness campaign for the population. To date the Ministry has not developed and



made publicly available the methodology on usage of firewood resource, the information, which would help population to correctly plan and use the resource energy efficiently.

Under the existing practice, thermal loss of energy after consuming the raw firewood is 30-40%. Accordingly, the population as a result of non-energy efficient utilization of the firewood consumes more resource than it is actually necessary. Hence, by increasing the productivity of the firewood it is possible to reduce the consumption of the resource by one household.

### **Conclusion:**

For utilization of the forest resource as the source of sustainable energy, it is necessary to use the wood in an energy efficient way. Nowadays, 77% of the resource is obtained in the non-optimal period and thus maximal heating energy cannot be obtained during consumption. The underlying reason is the non-optimal planning of the resource allocated for the social felling activities. In particular, 75% of the allocated resource is available to the population in August-November period, correspondingly the population obtains bulk of allocated resource in autumn and consumes the raw resource in winter due to which it is impossible to obtain maximal benefit from the firewood. In case the energy efficiency of the firewood is secured, it will be possible to downsize the thermal loss for 30-40% and reduce the amount of firewood consumed by one household.

### **Recommendations:**

#### **To LEPL National Forestry Agency:**

- › For the purpose to use firewood in energy efficient way in the social sector, the NFA should ensure availability of the necessary minimal period for drying of obtained firewood, by observing optimal timing of allocation and opening periods of the cutting areas.

#### **To the Ministry of Environment and Natural Resources Protection and LEPL National Forestry Agency:**

- › For the purpose to ensure correct and energy efficient utilization of the firewood resource, the Ministry and the Agency shall conduct awareness campaign among population by means of developing the guideline for using firewood resource and promulgating it by means of different media.

## Summary Conclusion and Recommendations

Preservation of the forest resources depends on sustainable forest usage, for this purpose the forest managing bodies should envisage the real data available in the sector and on their basis plan the measures necessary for achievement of the sustainability.

Measures undertaken by the Ministry do not properly respond to the deficit of the firewood in the social sector of timber use. It is notable that the resource allocated in the scope of the social felling activities is not sufficient to meet the real demand on the resource, due to the social background existing in the regions and due to absence/high cost of the alternative heating sources, the population has to illegally obtain or purchase illegally extracted firewood resource. High demand on the firewood and insufficiency of the resource allocated by the forest managing bodies, facilitate operation of the illegal market of firewood trading, which on the other hand, complicates performance of obligations of the Ministry and implementation of measures necessary for forest preservation and sustainable management.

State audit office believes that on behalf of the Ministry it is necessary to immediately exercise measures to ensure sustainable management of the forest. In particular, in the short term perspective, the Ministry for the purpose to restrict illegal forest usage and illegal trading should maximally satisfy the real demand of population on firewood. Illegal forest usage and associated illegal market presence makes it impossible to determine the real forest usage in the sector, accordingly, absence of the accurate and realistic information hinders planning of the due measures for achieving sustainability. After eradication of the illegal trading market, the Ministry will be able to see the actual situation existing in the sector and on the basis of the correct information provide due feedback.

In addition to meeting the legal demand of population, it is important that the Ministry determines the optimal amount of forest resource utilization which will be based on accurate and actual data reflecting forest conditions. In order to make it possible to utilize optimal amount of forest resource in the long term perspective, it is important that the Ministry in cooperation with the various public entities, gradually substitutes the firewood with the alternative energy sources.

Initially, legally meeting the real demand of population may contradict to the principles of sustainable management, however this shall not change the amount of resource consumed in the social sector. Consequently, the Ministry will be able to eradicate illegal forest usage, control the entire sector and effectively manage the forestry sector. Otherwise, the actual situation in terms of illegal forest usage and trading market and its restriction ways will not be clarified.

Also, according to the new forest code, creation of the state enterprise is planned in the forestry sector, which will be authorized to produce-trade material and firewood timber resources. In parallel to this enterprise, illegal production-trade of firewood will hinder effective development of the sector and achievement of sustainability in the forest usage.

In terms of overcoming firewood deficit in the country, significant role is attributed to optimization and reduction of the resource consumption in the public sector. At the gasified public sector, substitution of the firewood with the natural gas shall reduce consumption of the resource and

accordingly the negative impact on the forest. Thereby, justified request of the resource at the public sector shall create the prerequisite for economic, purposeful utilization of the firewood and in case of necessity the possibility to check. Also, by implementing the policy necessary for development of the residue biomass sector, the Ministry will be able to overcome the firewood deficit existing in the country.

For the purpose to reduce the impact on the forest and reduce the firewood deficit, it is also important to energy efficient utilization of the resource. By adopting the optimal periods for extraction by the forestry agency, it will be possible to ensure the minimal necessary time for resource drying. Thus, by energy efficient utilization the population will be able to increase the thermal energy obtained from the firewood and accordingly it will be possible to reduce the consumption of resource by each household.

### **Recommendations:**

#### **To the Ministry of Environment and Natural Resources Protection and the LEPL – National Forestry Agency:**

- › For the purpose to ensure sustainability of the timber resource usage in the social sector and plan measures necessary for maintaining the resource, it is important that the Ministry and the National Forestry Agency determine annual norm – amount of the resource, considering which, timber use will not cause forest fund reduction.

#### **To the Ministry of Environment and Natural Resources Protection**

- › To identify the firewood resource deficit in the social sector and plan respective measures for its reduction it is important that the Ministry determines the real demand of population on firewood resource at the regional and municipal level.
- › For the purpose to restrict illegal trading and achieve sustainable management of the forest, the Ministry should ensure maximally legal satisfaction of the demand, taking into account the deficit existing at the regional and municipal levels. In the parallel regime, the Ministry, together with the other public entities (Ministry of Energy, Ministry of Agriculture, Ministry of Education, Ministry of Finance, Ministry of Economy), should initiate and incorporate other measures aimed at reducing the firewood deficit, so that the social tree felling gradually reduces and becomes compatible with the annual sustainable norm of usage.

#### **LEPL – National Forestry Agency:**

- › For the purpose to raise the participation of population in the social felling, NFA, by better planning of the access roads to the allocated forest felling areas, should improve the firewood resource availability and facilitate usage of the resource at the allocated areas.

**To the Ministry of Environment and Natural Resources Protection**

- › In the regions where the participation of the population in the social tree felling activities is low, for the purpose to increase the participation indicator and the legal usage of the resource, the Ministry should study the imbalance between the demand and supply of the resource and on the basis of the real information undertake necessary measures to regulate demand and supply.
- › For the purpose to reduce the deficit of the firewood the Ministry with participation of the responsible public entities (Ministry of Energy, Ministry of Education and Science) should initiate gradual substitution of the firewood consumption at the gasified schools with the natural gas, also, the Ministry should identify gasified establishments, which consume firewood and together with the responsible entities (Ministry of Defense, Ministry of Internal Affairs, Ministry of Education and local municipalities) initiate gradual substitution of the firewood consumption at these establishments with the natural gas.
- › For the purpose to restrict illegal production of wood resource and selling in the public sector, the Ministry together with respective government entities, should gradually reduce utilization of illegally produced firewood in the public sector and ensure consumption of legally obtained firewood.
- › For the purpose to optimize the firewood consumption at the public sector and prevent inefficient/irrational use, the Ministry should develop the resource request justification procedures for the public sector and with the random selection principle conduct checkup of reasonable utilization of the requested resource.
- › For the purpose to utilize forests residue biomass energy potential, the Ministry, at the municipal level should study annual potential of the forests residue biomass and by using reliable information facilitate development of the residue biomass production sector.

**To the LEPL – National Forestry Agency:**

- › For the purpose to use firewood in energy efficient way in the social sector, the NFA should ensure availability of the necessary minimal period for drying of obtained firewood, by observing optimal timing of allocation and opening periods of the cutting areas.

**To the Ministry of Environment and Natural Resource Protection and LEPL National Forestry Agency:**

- › For the purpose to ensure correct and energy efficient utilization of the firewood resource, the Ministry and the Agency shall conduct awareness campaign among population by means of developing the guideline for using firewood resource and promulgating it by means of different media.

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### Links:

FAO, Definition of Sustainable Forest Management, available: <http://www.fao.org/forestry/sfm/en/>;

Phil Potter, Seasoning Wood for Fuel, available: [http://www.forestry.gov.uk/pdf/eng-yh-seasoningwoodforfuel.pdf/\\$FILE/eng-yh-seasoningwoodforfuel.pdf](http://www.forestry.gov.uk/pdf/eng-yh-seasoningwoodforfuel.pdf/$FILE/eng-yh-seasoningwoodforfuel.pdf).

