

## **FOREST COVER – MAIN PROTECT FROM OF VARIOUS DISASTERS IN MOUNTAINOUS AREAS**

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**Summary:** *Today for Biosphere and environmental protection in mountain regions the maintenance particular importance has the forest cover. The mountain forest is the main factor that facilitates the transfer of atmospheric precipitations to the depth of the soil, thus regulating the liquid surface runoff improving the water balance and protecting the river from the drying. The main thing is that forests protect the inhabited areas and populations, roads, fields and soils from dangerous disasters such as floods, mudflows, landslides, avalanches, erosion, etc. But, humans are not caring for it and resulting from unsystematic feeling forest are becoming sparse, are losing their protective functions. Therefore, for the present time the environment protection and rational use of forest resources is the global problem of paramount importance.*

**Key Words:** *Avalanches. erosion, floods, mudflows.*

### **Introduction**

Today one of the main concerns of the world society is the anomaly cataclysmic processes caused by global warming on our planet, which resulted in increasing catastrophic disastrous events that led to large destruction and casualties. With the increase of the population of the planet. The capture of forest areas and the irrational cutting of trees causes the reduction of photosynthesis process and the resulting increased heat beams of the sun is the reason that causes global warming, oxygen reducing, new viral, bacterial and chronic diseases [1].

In the XXI century it is expected to increase the temperature on the Earth, which will lead to the melting of Antarctic and Greenland ice, the sharp rise of the world ocean level and flooding the coastline, loss of crops, deficit of drinking water, floods, storms, and coastal erosion will increase as well [2]. Nowadays, for the purpose of Biosphere and environmental protection, for the climate regulation, stabilization of oxygen balance and the maintenance of biodiversity particular importance has the forest cover.

### **Study area and method**

The forest is a vital component of the biosphere and represents a complex combination of trees, bushes, and herbs, animals, birds, and microorganisms that are interconnected affect both the environment and each other. The forest has a substantial impact on the processes that are occurring in the atmosphere, on the surface of the Earth and below its depths. The forest cover participates in the emergence of natural resources such as soil, water, animals, minerals, energy, recreations, and resorts. The forest also plays an important role in economic activity. It is a source of raw material, which is widely used in different industries. The timber is used as building materials and still as a fuel. The forest also provides food and medicinal products. Paper, cardboard, furniture, parquet are made of it. 15 thousand types of a piece of work are made from trees, so the increase in population in the world and technical progress is the reason for an incredible increase in demand for forest resources [3].

The historical, informational and literary sources regarding forest have been studied.

### **Discussion**

The biosphere is the layer of the earth where the life exists and develops. It covers the whole hydrosphere, lithosphere and atmospheric parts. The atmosphere holds part of the space beams and the majority of meteorites. Only 48% of solar radiation reaches the Earth. If there was no atmosphere, the average temperature of the air on the surface of the earth would be 23 ° C, not 15 ° C [4].

In the past, the atmosphere did not contain much oxygen. Then it was rich with carbon dioxide, methane and nitrogen compounds. Nearly 3 billion years ago, the first living organisms on the earth were created at the bottom of the non-deep parts of the hydrosphere, where with the carbon dioxide absorbed by the plant's chlorophyll and from the weather with help of solar energy, free oxygen is released. This process is called photosynthesis. Over a year there are more than 10 billion kcal of solar radiation per 1 Ha on Earth, which is used by the plant for photosynthesis. Every year, with the solar effect, by the green plants, about 83 billion tons of organic substance is formed on Earth. Because of these, 53 billion tons are created on land and the rest in the seas and oceans. Because of photosynthesis, the quantity of carbon dioxide in the atmosphere was reduced to 0,03%, and the number of free oxygen increased to 21% or 1000 times [5].

The development of plants containing chlorophyll on the ground along with the increase of oxygen contributed to the formation of soils. As a result of photosynthesis intensity atmospheric ozone was created, which stopped the adverse effect of ultraviolet beams of the sun. This contributed to the development of the organic world first in the upper layers of water, then on land. Millions of years later, various species of plants were developed that were the primary products for animal and human nutrition [6]. Later, thanks to the increased amount of oxygen, a variety of flora and fauna, including humans have developed on earth.

At present, there are about 2 million species of plants and animals, including animals up to 1.5 million.

The vegetation of the earth annually assimilates around  $5 \times 10^{10}$  tone carbon, or absorbs  $1,8 \times 10^{11}$  tone carbon dioxide, decomposes  $1,3 \times 10^{11}$  tone water, separates  $1,2 \times 10^{11}$  tone molecular oxygen and gathers  $4 \times 10^{17}$  Kcal solar energy [7].

It is estimated that all 50-60% of oxygen is released by land vegetation and the rest by the phytoplankton. 1 ha forest in 1 hour absorbs so much carbon dioxide as 200 people breath out in 1 hour. During one year, 1 ha of mixed forest absorbs 15 t. Carbon dioxide and releases 13 t. Oxygen. The use of oxygen by humans depends on the physiological condition of his body, age, weight, and sex. In medicine, it is known that the person in a waiting period in one minute spends 0,35-0,40 liters Oxygen and 5 l / min during work. A person needs 500-600 liters Oxygen in a day, therefore a forest area per person should consist of at least 0.3 ha [6]. So the vegetation cover is the source of oxygen, food, and energy, and therefore the existence of humans and animals depends on the condition of the forest cover. But the forest is ruined unmercifully by people [8]. The oldest vegetable cover is found in Australia, which is 395 million years old. About 370 million years ago, vegetation was a form of a bush. Primary forests were low. 345 million years ago, the Stone Age began, when dense, wide forests have been spread with 30 meters high trees. Over the last 800 thousand years, humans have been able to get rid of around 50% of the forest area. Several hundred years ago the forest areas were 7.2 billion hectares, covering 48% of the land. At present, the area covered by vegetation is 12.2 billion hectares 4,1 billion of which are covered with forests [4].

Table. Areas of the World Forest and Their Dynamics

Region	Common area, Mln ha	Forests of local species, Mln ha	Forest, % from the total area	Forest areas, Mln ha		
				Change of forest area 2010 – 2015		Forest Plant Area
				Total	Annual	2015
<b>World</b>	3999	1277	31	- 17	- 3,0	290
<b>Africa</b>	624	135	23	- 14,2	- 2,4	16
<b>Asia</b>	593	117	19	- 3,4	0,8	129
<b>Europe</b>	1015	277	34	1,9	0,3	82
<b>North America</b>	751	320	33	0,4	0	43
<b>South America</b>	842	400	49	- 10,1	- 2	15
<b>Oceania</b>	174	27	23	1,5	0,3	4

According to FAO estimates (Table 1) in 2015 forests were covering 4000 million ha of land or 31% of its total area. In the early twentieth century, the forest area was about 2 ha per capita. In 2015, per capita comes only 0.6 ha of forests. With regular inventory manufactured by FAO, forestry is decreasing with high rates: from 1990 to 2000 annual decrease was 16 million hectares, and in 2000-2010, 13 million hectares, in 2010-2015 the forest area decreased with 16.5 mln ha or yearly forests were decreased by 3,3 mln ha. In 2016, the destroyed forest area was 29.7 million hectares.

Destroying the forest increases with geometric progress every year. The reason for this, besides the tree cutting, is that the forest area goes into land use categories (arable, towns, roads, etc.). Forests are also destroyed because of natural disasters (landslides, avalanches, etc.) after which the trees will not be restored. According to National Geographic, 80,000 m<sup>2</sup> green cover is damaged annually, causing not only material loss but also victims. For instance, fires resulted in 100,000 deaths in Indonesia. In 2017, about 100 people were killed in California, Portugal, and Spain because of fire. The fires were hugely destructive in California in November 2018 when more than 70 people were killed, 1400 people were lost, and up to 100 ha forest were burnt and about 80 thousand houses were destroyed. It is important to note that during the fires besides people, a lot of live beings, living in the woods die.

With the destruction of forest from the beginning of XXI century, forest cover will be increased by artificial forest or naturally restored forest. From 2000 to 2010, forest area in Asia grew by 2,2 million ha, mainly due to the intensive cultivation of forest in China. Forest areas in Europe have grown annually by 700 thousand ha. Mountain slopes in Georgia were covered with frequent forests, where many varieties of fruits were produced, and many species of animals and birds lived there. That's why the Georgian peasants were kept, defended and fed by the forest. Therefore, in the past, the forest industry has been created here.



Forests in Georgia  
(National Atlas of Georgia, 2018)

The forest cover starts from the seashore and extends to 2100-2200 m, and in some cases up to 2500 m. The total forest fund of Georgia amounted to 3007.6 thousand hectares in 2010, which is 43.2% of the country's territory, but it is spread unequally: 58% in west and 42% in the east. 73% of the forests are located at the height of 1000 m above 80% of which are spread over the slopes of over 20°. Forests cover 2770 thousand ha of the state forest fund of Georgia, with 86 protected areas covering 600 thousand ha [9].

In the valleys of high mountains and hard to reach gorges the untouched forests (566 thousand ha) are still remaining. According to World Bank experts, in Europe, we can hardly find a country where the natural landscapes of unique beauty are so exquisitely replaced by old cultural landscapes. It is noteworthy that the forests of Georgia, is the shelter of pre-ice age flora and fauna, or Relics, that connect us with ancient geologic epochs and their area will be a huge loss not only for Georgia but for all mankind.

Along with timber, more than 150 species of plants in the forests give fruits, berries, walnuts, and other resources, using of which can make significant contributions to economic development. More than 110 species of plants are used in medicine. 2/3 out of 48 medicinal and 200 recreational resorts of Georgia are located or surrounded by forest. Their existence in the forest is justified by an aesthetic viewpoint. Therefore, ecotourism and resort-recreational farming are developed in Georgia. The potential of hunting tourism is also great in Georgian forests [10, 11].

The forest is factor of climate formation. Its importance of the forest is first revealed in the regulation of the air elements (air temperature, humidity, motion speed, etc.) that affects human health. In the forest, where almost all the tree-plant emissions of gliding aromatic essential substances Fitoncides, which can disappear many microbes and viruses, that cleans and makes the air healthier. 1 m<sup>3</sup> air contains up to 500 pathogenic bacteria, while the in the 1 m<sup>3</sup> air of the city there are 36,000 bacteria. The forest is the strong filter of the air from dust. It is estimated that 1 ha forest during the year filters 50-70 tons of dust. In this regard, beech copse, 1 ha area of which filters about 68 tonnes of dust. Forest to absorb various kinds of noise. In the case of a forest cover, the yield increases by 20-25% [10]. The impact of the forest stripes is particularly pronounced in the months leading up to drought. It is said: "The forest produces water, the water produces a harvest, and the harvest produces the life".

In particular note water management and soil protection skills of the forest. Part of the atmospheric precipitation on the land surface is slept down in the soil that feeds the river all year round. The higher is the seepage in the river the less is the flood and erosion of the soil. Therefore, forests also perform watershed and protective functions. In this regard, the importance of forest is huge in mountainous areas where there are many other defensive features added to the multilateral purposes of the forest, described above. The forest in the mountains regulates the flow of rivers. According to statistical observations, the high frequency (> 0,8) mountain forest is the main factor that facilitates the transfer of atmospheric precipitations to the depths of the soil, thus regulating the liquid surface runoff, improving the water balance and protecting the river from the drying. The main thing is that forests protect the inhabited areas and populations, roads, fields and soils from dangerous disasters such as floods, mudflows, landslides, avalanches, erosion, etc. [12].

No one argues about the great importance of the green forest cover, but as for the proper attention to it, it is not yet visible. The reason for this is the enormous increase in demand for forest resources as a result of population growth and technical progress. In addition, tree-plants are usually cut into forest copse as well as in the towns and planting strips, which, in addition to the lack of oxygen, resulting in the reduction of water keeping and catchment function, which causes drying of some springs, rivers, and lakes.

## **Conclusion**

Forest is a complex ecosystem of trees, plants and living organisms, which is the guarantee of preservation of the cosmic-ecological - economic- sustainable environment of the biosphere on Earth, along with water, air, and soil. The forest absorbs carbon dioxide and releases large amounts of oxygen, regulates microclimate (humidity, temperature, and wind). The forest is a powerful filter for cleaning air and water from harmful impurities. By doing so, it makes the environment healthy and friendly affects human and other living organisms. The forest also provides many types of food and medicinal products.

Forests protect agriculture and populated areas from strong wind. Forest is also the main factor for regulating water resources. It improves groundwater quality, increases their debate. In the mountains, forests protect communities, roads, and fields from floods and mudflows, erosive processes, landslides, and avalanches. The forest promotes an increase in yield.

The forest has great importance in agricultural activities, as a source of raw timber, which is used in various industries. With the increase of population and farming, demand on the timber is increasing as well. Because of this, forests are cut and the forest area is reduced to 0.3% annually in the world.

In addition to plant cutting and disease, the forest is also damaged by fires, which have become more frequent in areas of different countries due to the negligence of adolescents in terms of climate warming.

Because of this the number of oxygen decreases and the amount of carbon dioxide increases in the atmosphere and climate heats intensively.

It is noteworthy that the use of forest areas has helped not only the plant but also the reduction of unique representatives of animals and birds. Particularly negative consequences are to eliminate forests in mountainous areas where the river water regime changes, catastrophic floods and torrents increases, erosive and landslide phenomena develop, soil erosion, stone erosion, snow-glacier evolution, etc. occurs. The areas that aren't covered by the forest began to become a desert that was accompanied by the reduction of food production.

According to expert conclusions, the global warming in the XXI century will continue and the temperature of the Earth may increase by 2 - 4 °C, which will seriously damage the ecosystems and most of the world's countries' economies. So technical progress, on the one hand, improves the conditions of human well-being, but on the other hand, threatens their future. Today, the protection of nature and the rational use of its resources is the primary problem of human significance. It is a necessary precondition for biosphere existence. Therefore, in all countries of the world, special attention should be paid to the protection and expansion of forest cover. In agricultural fields, the protective lines of the forests should be planted, which will help to increase yield. In order to ensure rational use of forest resources, its manufacturing and processing processes must be undertaken with complex non-waste technologies.

In order to protect the biodiversity of forests in the perspective, the system of biomonitoring should be created and timely restoration of forests and their management should be carried out; It is necessary to develop long-term programs for the rational use of forest resources in order to improve forest productivity and its qualitative composition; Complex production of timber raw materials - introduction of techniques of progressive methods of processing and non-waste technologies and finally creating protected areas for the purpose of maintaining biological and landscape diversity.

It is also necessary to raise the knowledge of the broad parts of society on nature and its rational use. Proper bring up of the youth and their love of nature can save the biosphere and our natural environment from destroying and bring us economic prosperity.

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