

УДК 811.111:502.53

Bulynko M., Yalovik E.

## **Anthropogenic Impact on the Ecological System of the Forest**

Belarusian National Technical University  
Minsk, Belarus

The forest is one of the most important factors in the ecological balance of the biosphere. It is the largest storage of solar energy, biological mass and one of the sources of oxygen on earth. The process of forest destruction is an urgent problem around the world, as it worsens their ecological, climatic and socio-economic characteristics. At the moment, forests occupy about a third of the land area, which is 38 million km<sup>2</sup>, 264 million hectares of which, or 7%, are planted by humans. Anthropogenic impact on forests is any type of human activity that has a significant positive and negative impact on them. Currently, such problems as: forest fires caused by humans, deforestation, poaching in the timber industry, radioactive contamination of forests and many others are particularly acute. This leads to an increase in the concentration of carbon dioxide in the atmosphere, desertification and waterlogging of land. The human impact on forests and on the entire plant world can be direct and indirect. Direct impacts include: continuous deforestation, forest fires and burning of vegetation, destruction of forests during the creation of economic infrastructure. Indirect impact is a change in living conditions as a result of air and water pollution, the use of pesticides and mineral fertilizers. The penetration of alien species of introduced plants into plant communities is also of some importance. Every 5 years the forests of Belarus lose about 20% of the area of operational forests. The plan for deforestation is

25,000,000 m<sup>3</sup> per year, which is about 125,000 hectares. The problem of forest disappearance is really relevant. With the decrease in the number of trees, the species diversity of animals and plants inhabiting forests also decreases: 60 thousand species of plants and trees, 75% of bird species and 68% of mammal species. At least 30% of various tree species around the world are endangered. To represent the state of forests, let's compare the annual net change in forest area. This is a set of indicators of forest area reduction and its growth over a certain period of time. In the period 1990-2000, the decrease in forest area was -7.9 million hectares per year, in the period 2010-2020 – 4.7 million hectares per year. The indicator has decreased significantly, which means deforestation continues, but at a slower pace [1]. This process leads to local and global climatic changes. Deforestation contributes to global warming and is often called one of the main reasons for the intensification of the greenhouse effect. Greenhouse gas emissions have doubled since 1980, and the average temperature on the planet has increased by 0.7 degrees Celsius. In the modern Earth's atmosphere, the concentration of carbon dioxide in dry air is 300-450 ppm. Approximately 20% of greenhouse gases come from deforestation. Forests absorb up to 2 billion tons of carbon dioxide per year [2]. Deforestation can lead to soil erosion, the growth of ravines, flooding and landslides, that is, to the loss of farmland areas. It also negatively affects the water cycle and irrigated agriculture, it worsens the hydrological mode of rivers. Trees absorb underground water through their roots, water rises to their leaves and evaporates. During deforestation, the transpiration process stops and the climate becomes drier, the ability of the terrain to delay precipitation decreases. Forest protection is one of the most affordable means of combating climate change. Poaching in the timber industry is a serious problem. Forest poaching is one of the environmental crimes and there is

criminal liability for illegal felling or damage to the extent of stopping the growth of trees, shrubs and lianas. Over three decades, the area of protected forest areas has increased by 191 million hectares and reached 726 million hectares, which is 18% of the world's forests. Not all deforestation is caused by humans, sometimes it is a combination of natural processes, such as fire and floods. Every year, fires destroy significant forest areas. After them, forests can recover, but this does not happen, because people begin to engage in economic activity in the burned-out territories: they use the territory as pasture for livestock and agriculture, as a result of which the young forest cannot grow again. In addition to the negative impact, humans also have a positive impact on the forest ecosystem: extinguishing fires during peat burning, restoring rare species of animals and plants, by creating nature reserves, wildlife sanctuaries and national parks. The complex of measures to protect the forest ecosystem includes: planning of land use, the introduction of points of protection and control, improvement of legislation on environmental protection. Much attention is paid to improving the fire resistance of the forest fund, prevention of forest fires in pollution zones. According to radiation monitoring and monitoring data, the area of polluted forests decreases annually by an average of 2.6%.

Currently, human economic activity is becoming more and more global, thereby having a huge impact on forests as a whole, so it is worth paying attention to this problem.

#### References:

1. Олейникова Е.В., Зиновьева И.С. Антропогенное воздействие на леса // Успехи современного естествознания. – 2012. – № 4. – С. 191–193.
2. Леса на планете земля [Electronic resource] – Mode of access: <http://eco.na-vi.su/deforestation/> – Date of access: – 08.04.2022.