

Reclamation of Disturbed Lands

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Key words: environmental impact, industrial landfills, reclamation, forest restoration of degraded sites, innovations in forestry

Although Earth has lost at least 35% of its pre-agricultural forest cover over the past three centuries, forests are still widely distributed, covering a total of 40 million km² (~25%) of Earth's terrestrial surface. Of the remaining forests, as much as 82% is now degraded to some extent as a result of direct human actions such as industrial logging, urbanization, agriculture and infrastructure. Anthropogenic degradation of forest biogeocenoses of the planet causes economic activity, which is expressed in physical changes in forests and leads to a decrease in their ecological functions. This may be the fragmentation of forests, clear-cutting, excessive seizure of resources of individual species (both tree species and hunting objects) and changes in fire and flood regimes.

Currently, on the territory of the Russian Federation, where forests used to grow in previous centuries, several million hectares of land were disturbed during the development of mineral deposits, lying of linear objects, carrying out logging, reclamation, exploration, storage of industrial and household waste, and more. The accumulation of industrial waste is due to the extraction and production of minerals, and inevitably causes the alienation of producing lands, during which there is a dangerous environmental pollution and accumulation of environmental damage.

It has been experimentally proven that acceptable as artificial soil factors for accelerated biological culture and biophysical research are a mixture of various natural factors that are rich in organic matter, in which there are strong hygroscopic, weak and weak substances that cause strong hygroscopicity and disease. and phosphogypsum, phosphorus and sulfur. For reclamation, we use aspen, red oak and pine. For experimental and mental work in the laboratory, seedlings with a closed root system of the following species are grown: red oak – 400, aspen – 400, and pine trees – 400. Differences and differences in man-made soil using dump trucks and bulldozers, as well as planting trees and shrubs by hand.

When developing reclamation technologies, the authors of this article patented several ways to improve soil fertility, and the ecological reclamation project was recognized as important for the tasks of environmental safety and modernization of the country, and was awarded the highest award of the Governor of the Moscow Region in the area of "Resource Saving and Introduction of Environmental Technologies". And we can confidently state that the afforestation associated with the restoration of degraded sites allows:

- *reduce the cost of acquiring materials for the creation of artificial soil;*
- *reduce the negative impact of landfill sites and mine openings on the environment;*
- *dispose of household sewage sludge at the district wastewater treatment plant;*
- *improve landscape landscaping.*

The Institute has developed a set of technological techniques that allow efficient use of forest objects, organic waste production and consumption, such as wood and agricultural waste, plant residues, rainfall sewage, etc. Other environmental challenges have arisen, including at the international level: adaptation of forests and forestry to climate change, reduction of forest biological diversity in the areas of their development, use of modern achievements of genetics. All-Russian Research Institute of Silviculture and Mechanization of Forestry conducts research in these areas, which will make it possible to develop sound solutions that will ensure ecological balance and sustainable development of forest ecosystems.