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Forest Regeneration in the Context of Current Biodiversity

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Abstract

The forest represents a remarkable natural resource for man and society. Its importance and value is enhanced by the fact that compared to other natural resources like oil, natural gas, coal, forest is characterized by its capacity of reproduction, as a result of a natural process of renewing tree generations. The regeneration of forests, respectively the passage of trees from one generation to another through the application of efficient treatments, is a prime objective in the activity of intensive, rational and multifunctional management of the forestry fund. It is also one of the priority activities in Romania, because the extension of the forest area is done by: regeneration of all forest areas from which timber was harvested, afforestation of land without forest vegetation, ecological reconstruction of land plots affected by degradation phenomena. In this paper, we will see exactly how forest regeneration has evolved in recent years and what are the best strategies for regenerating these areas.

Keywords: Regeneration, forests, biodiversity, ecosystem, environment.

JEL Classification: Q57

1. Introduction

Over time, several factors have acted to the degradation of the forest ecosystem, in different forms, closely related to the population's historical development stage. Their ecological impact, the general imbalances have been increasing continuously and are often irreversible. Deforestation is the main factor, reducing the forested area in favour of the expansion of the agricultural area, or of the need for fuel or construction material. The intensity of these processes is determined by the pace of population growth. Referring to Romania, the main enemy of forest vegetation is

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drought. Most of the time, the steppe vegetation can take over the place of the forests, and the soil has a rather diminished protection. Whatever, the purpose of deforestation remains the main risk factor for the entire forest ecosystem (Kotler, 1998).

The paper will present statistical data on the structure of the forest fund and area, the volumes of wood harvested by species and main destinations and the structure of sales of forest products during the 2014-2018 period. The article will also focus on the cutting area and forest areas that have been regenerated, by land categories. The obtained results will be interpreted and analysed in order to be able to notice the state of Romania at that moment.

In view of the above, in approaching this analysis that involves a quantitative research methodology, we will use series of data processed from the previous statistics and we will identify what are the trends for the forest area and why in our country some factors are anthropically influenced.

The abusive cuts that have taken place in the past 4 decades have led to an export exceeding the regenerative capacity of 143 m^3 of wood from Romania. The erosion processes that started on the upper slopes of the mountainous area intensify as we approach the base, increasing the amount of sediment (Preston, 2000).

The distribution of forests on the territory of Romania is not uniform, and their surface is deficient especially in the plains where the most deforested areas or physical-geographical units are:
• Bărăgan Plain (3.6% afforestation degree);
• Oltenia Plain (5.4% afforestation degree);
• Western Plain (3.1% afforestation degree);
• Transylvania plain (6.7% afforestation degree);
• Moldavian Plain (with only 4.2% afforestation degree).

According to the reports prepared by the Territorial Inspectorate for Forest and Hunting Regime, most thefts were recorded in the hill and mountain areas for the species of hornbeam, durmast, beech, acacia and oak. The worst thing is that many cuts came from the locals after obtaining title deeds and it was found that large areas of forest were cleared in a very short time, thousands of trees being felled and transported with the help of heavy-duty machines, according to the findings from the Forestry Directorate (Castro, 2004).

The governmental measures that were taken to stop the deforestation were the issuing of an emergency ordinance (GEO) through which the forests were redistributed to the forest schools for better management, so the owners of these goods have the obligation to conclude contracts of administration of all land plots only with authorized forest schools (Merce, 2016).

The research topic that we have chosen supposes understanding the economic-ecological mechanism by its specificity and refers to the relationship between man and environment in economic sectors such as agriculture, industry, tourism, forestry, etc. The current situations which Romania is facing are major and need to be linked to the economic and ecological components which will involve efficient

economic management. The dysfunctionalities of the economic and ecological risks will be highlighted, by preserving the forest area in the current context of sustainable development (Hunt, 1999).

2. Problem Statement − Effects of Deforestation

The phenomenon of deforestation affects the climate in several ways. Trees release water vapour into the air, and also provide the necessary shade that keeps the soil moist. This leads to imbalance in the atmospheric temperature, which makes it difficult in certain ecological conditions. This accidental arrangement of forests has led to the disappearance of certain species of animals or we encounter several species that have difficulties to survive or adapt to new habitats (Bran et al., 2011).

The disappearance of forests is known for many negative effects, some of which occur immediately, and others are medium and long term. For the effects that appear immediately we mention soil erosion that will shortly lead to the occurrence of desertification due to the lack of forest curtains. The effects in the medium and long term involve the disappearance of forest vegetation that contributes to the "greenhouse effect", the destruction of plant and animal species or even the damage of the ecosystems of the remaining forest (Daniels, 2003).

Table 1. Regenerated surfaces, by types of regenerations and by categories of land, between 2014 and 2018

Categories of land	2014	2015	2016	2017	2018
Regenerations - total	25,727	26,285	29,505	28,750	28,456
Natural regenerations	**14,701**	**15,848**	**16,997**	**16,904**	**16,841**
in the forest background	14,618	15,848	16,997	16,903	16,841
in land taken over by the forest fund	65	-	-	1	-
in land plots outside the forest fund	18	-	-	-	-
Artificial regeneration	**11,026**	**10,437**	**12,508**	**11,846**	**11,615**
in the forest background	10,088	9,902	10,077	11,260	11,004
in land taken over by the forest fund	106	33	76	61	1
in land plots outside the forest fund	832	502	2,355	525	610

Source: National Institute of Statistics

During the whole period analysed, the artificial regenerations had a much lower weight in the total of the regenerated surfaces than the natural surfaces.

The activity of regeneration of forests is generally carried out continually by maintaining and installing forest vegetation. The seedlings on the natural regenerations occupy a quite large share. For these planted seedlings, it follows a not very easy period, because it takes time to accommodate with the new environmental conditions, with a soil poorer than the soil in a nursery and with the competition of grass species. After planting, it is necessary to perform certain maintenance works on the plantations and the mobilization of soil around the seedlings. Each autumn, it is established the total number of regenerations and the percentage of those which have taken root is also calculated. Those that are dry are replaced in spring.

In the graph below, you can see the structure of the surfaces by types of regenerations, where it is clear that most of the regenerations took place in 2018, about 97.9% (only in forest fund) and slightly over 2% per land outside the forest fund.

Table 2. Artificially regenerated surfaces, by types of artificial regeneration, between 2014 and 2018

Types of artificial regeneration	2014	2015	2016	2017	2018
Artificial regeneration - total	**11,026**	**10,437**	**12,508**	**11,846**	**11,615**
Plantations	**10,969**	**10,315**	**12,456**	**11,790**	**11,578**
from deciduous species	5,162	5,106	7,127	5,632	5,398
from softwood species	5,807	5,209	5,329	6,158	6,180
Direct seeding with forest seeds	**57**	**122**	**52**	**56**	**37**
from deciduous species	54	109	37	31	30
from softwood species	3	13	15	25	7

Source: National Institute of Statistics

Out of the total artificially regenerated area, the largest percentage is represented by the plantations comprising 99.6% resin species over a total area of 6,180 hectares, together with the plantations of deciduous species over 5,398 hectares.

Table 3. Land and soil preparation works, care of young crops and natural regeneration aids, between 2014 and 2018

Name of works	2014	2015	2016	2017	2018
Field preparation	3,683	2,761	2,522	2,977	3,023
Soil preparation	-	2,614	2,222	1,943	1,816
Care works for young cultures	85,308	84,951	88,379	81,378	83,730
Works to help natural regeneration	16,321	17,598	20,353	18,482	18,134
Works for the installation of the natural seedling	5,429	5,840	4,966	5,311	5,417
Sowing and planting under the massif	395	342	224	306	711
Maintenance work	10,497	11,416	15,163	12,865	12,006

Source: National Institute of Statistics

For the year 2018, field preparation works were performed on an area of 3,023 hectares, which represented 46 hectares more than the previous year, soil preparation works on an area of 1,816 hectares, with 127 hectares more compared to 2017 and care of young crops on 83,730 hectares which is 2,352 hectares more compared to 2017.

Conclusion

In the above, we tried to discover what the main factors that influence nature are; overall, this is a study on the development and protection of forests that we must protect, as it offers us great benefits. The forest represents a very important economic resource and is also an attenuator of the climatic factors, because in winter it decreases the amount of snow that comes in direct contact with the soil, during the summer it absorbs the surplus of water, restoring it later in nature, stabilizing the soil and it generates a significant amount of oxygen, representing a good filter for pollutants. If the forests in our country disappeared, over 70% of the species of wild animals and plants would be endangered. The decline of the forest ecosystem will in the future induce some rather serious ecological imbalances such as land degradation, which will have a direct effect on agricultural productivity.

A Romania without forests would look much worse and more vulnerable, which is why we have to make minimal efforts, but coming from as many people as possible, to give an answer to the question "Who will save the forests in our country soon?"

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