

Original Article

The Management of the Anthropic Contribution to Forestry Ecosystems in Ghiurghiu Mountains

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Abstract

This paper aims to deliver important knowledge support for official statal institutions designated to manage the forest fate, and determining a more realistic action upon forest, by the activity of forest managers, specialists and private owners. The results of our study also is valuable and useful for the scientific community in what concerns the study of the consequences resulted from the irresponsible action of man upon the forest. Our study, also recommends the followings: limitation of the cutting quota in the limitroph areas anthropically affected by deforestation; recovery of the forest echosystems by reforestaion of deforested areas, recovery of the installed stands by promoting the natural forest type; reconsideration and framing of the identified stands in functional groups that will benefit of special protection; correct assessment of the social and economical importance of the forest.

Keywords: deforestation, management, illegal cuttings

1.Introduction

The present economical and social realities require solving quickly, and clarifying the theoretical and practical impact of shortfalls caused by human intervention in natural ecosystems, in particular in the forest [1, 5, 10].

Among the most disruptive factors influencing the growth and development of forest, there was identified the human contribution, which regularly and constantly affects forest ecosystems at local, regional and national levels, with effects on a global scale [2].

Between the economic and the ecological processes, an unbiased, direct relationship that influences each other is recorded.

The relationship between economic processes and judicious management of the natural resources of the ecosystems may be based on principles that deliver the premise that they do not collapse with the opportunity and ability to continuous regeneration of the equilibrium [6, 9].

The natural ecosystems, in particular the forest, create conditions for the development of the social system. In correlation, the human society and social system as a whole can affect and alter, sometimes irreversible, self-regulation and self-organization of the forestry systems.

The analysis of the management of anthropic factor and efficiency of the analysis of the impact of anthropic factor is relevant for a geographical unit, relatively uniform from geographical point of view, stand structure, homogeneous in terms of level of demand of wood products, in terms of forest dependence of local communities, and also on degree of economic and social development [2, 3, 5].

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It was considered that Gurghiu Mountains are a representative area from the point of view of the anthropic impact on forest ecosystems [4, 7].

The general problem considered in this study consists in the identification of human interventions in the wild in forests, especially through excessive tree cuttings that causes great imbalance with regard to the forest ecosystem.

They can have local harmful effects, both vertically and horizontally, the most evident being the increase of the incidence of floods and landslides [8].

Determination and assessment of environmental damage, in terms of quantity, represents the essential element in the management of forests in the anthropic risk conditions. Thus it is identified as desirable and necessary mapping risk areas and this represents a real possibility for synthesis, analysis and decision on the implementation of some forestry technical measures concerning the management of the forest ecosystem.

As a result of the analysis of data relating to disruptive factors in the area of Gurghiu, Mountains, the main objective of our research was to quantify the anthropic impact of dendrometric and ecological effects on affected stands, in conjunction with factors select as determinants and possibility of generalization of the study method [4, 8, 9].

The aim of the present study consists in identifying and estimating the consequences of action of the anthropic factor and also of disturbances due to this action in forest ecosystems of the Gurghiu Mountains.

2. Material and Method

In addressing and identification of problems it is necessary to traverse several steps relating to the identification and assessment of forest resources and the manifestation of individual factors:

- identification of the current situation and determination of the objectives;
- inventory of resources and data on the current situation of the area studied, types of stand, types of ownership and management;
- the establishment of the method of work, materials and equipment;
- analysis of all elements of the data contained in the documents concerning resources;
- expressing the action of failure factors resulted from anthropic impact considered in value units;

- proposal of measures concerning the mitigation of the impact of anthropogenic factors;
- monitoring and evaluation of the measures proposed for restoration of the effects resulted as consequence of the anthropic factors.

To identify and characterize the current situation concerning quantification of anthropogenic influence, there were taken into account comments on the damage produced by the creation of structural imbalances both vertically and horizontally, stands split, damage by illegal tree cuttings and soil, as well as imbalances of the forest biocenosis and the biodiversity conservation.

For carrying out the research the following issues were aimed:

- identification and determination for the whole researched area (within forestry offices, but also from unmanaged forest, returned by restoring the right of property), of the characteristics of the destructive impact on forest after criterion of illegal cutting and theft of wood;
- identification and recording of all changes occurring in the forest environment;
- carrying out dendrometry measurements concerning the quantification of damages of the forestry fund, in terms of the illegally extracted volume and comparison of the resulted volumes with the foresees of the previous arrangements.

The data were collected from control documents and field recordings performed by the author and forestry staff from forestry offices, measured in the field.

3. Results and Discussions

The Gurghiu Mountains area, is about 140 thousand hectares, of which approximately 135,000 hectares are forests, grassland areas of woodland or grassland with trees the consistency of 0.40 – 0.60. Of the total identified forest area, administered by authorized forestry authorities are of 122.60 hectares representing 90% of the forest area (fig. 1).

According to the research data, it was found that in the East and North - East area dominated by softwood stands, the privately owned unmanaged areas are most affected by the anthropic factor. Of all the factors which have caused disturbances in forest ecosystem, which invariably led to the worsening impact of anthropic, it was found that the illegal tree cuttings, in particular on the private property forest areas, is the most serious and destabilizing.

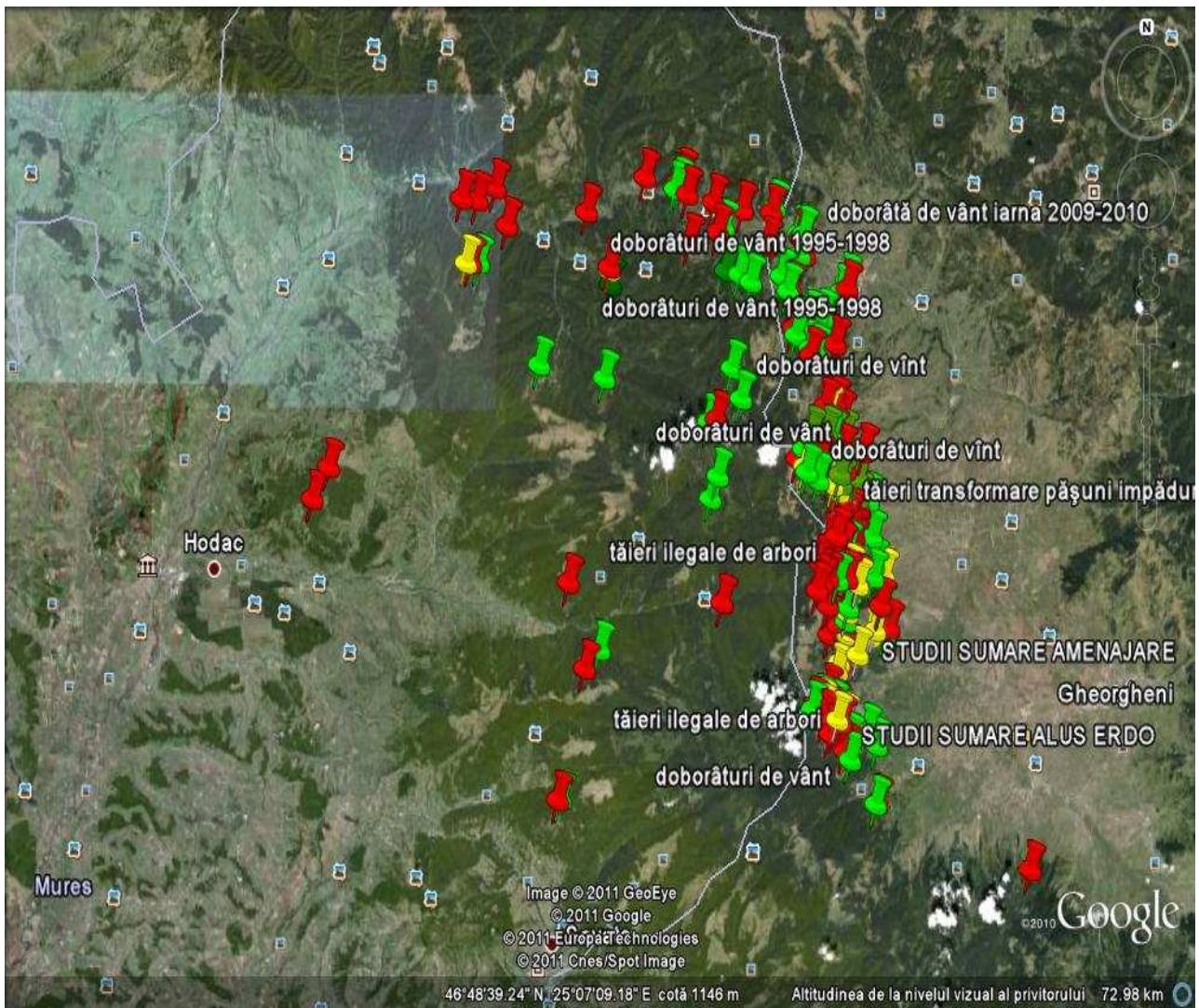
The mapping of the stands exposed to anthropic factor was carried out according to current identified consistency parameter. There have been identified fields very strong affected by anthropic factors, determined by a complex of cumulating factors, by wrong putting into practice of the forestry treatments, application of the summary studies in compliance with the real situation in stands (age, composition, consistency), intensification of illegal selective cuttings, produced sharp decline of stands consistency and their exposure to wind action (crashing).

As it may be observed (fig. 1), 1992 – 2010, the area affected by the anthropic factor is that

especially determined by the East and North – East part of the Gurghiu Mountains., locate in majority under the administration of the County of Harghita, where did not exist the legal obligation of guarding and managing the forest area by authorized forestry structures.

The total estimated area that was subject for illegal cuttings is about 20,000 hectares, being affected forestry area surfaces, of which about 4,000 hectares were totally deforested.

These areas were located around Lunca Bradului and Stânceni, County of Mureș, Toplița, Subcetate, Gălăuțaș, Ditrău, Remetea, Joseni, Borzont, Vărsag, Liban, county of Harghita.



Source: www.google.com

Figure 1. Mapping of areas anthropogenically affected in Gurghiu Mountains, 1992 - 2010

The comparative analysis of the situation concerning the tree cuttings indicates that the period 1970 - 1980 is characterized by a relatively small volume of injury, in amount of 3,570 m³, with an average of 354 m³ by year (fig. 2). This period is characterized by small damages, and the volume of standing timber in amount of around 400 m³, is due to:

- sufficient number of personnel within security guards bodies,
- stable legislation,
- permanent involvement of the legal authorities using "specific methods",
- proper involvement and organization of the activities concerning providing firewood to citizens,
- local authorities and last but not least,

- the social status of citizens and a high standard of living.

The period 1981-1985 recorded a total volume of 3,914 m³, 3 with a yearly average of 782.20 m³. The interval from 1986 to 1990, is characterized by increasing the illegal volumes of cuttings reaching a volume of 9,994 m³, annually being identified an average volume of 1,998 m³. Thus, it is found a substantial increase of damage compared to previous periods.

Lowering the standard of living, purchasing power, more limited possibilities of local resources, especially timber, resize the number of personnel after the take-over of communal and CAP, IAS, respectively, forests determined, beginning with 1985 increases up to 2000 m³, with a loss of about 1.40 cm³/100 ha.



Source: original photo, 2004

Figure 2. Deforestation of private forest areas – Remetea

The period during 1991 - 1995 represented a peak of damage observed in forests, with a total volume of 14,430 m³, with a yearly average of 2,886 m³.

The increase is due to the poverty and very low standard of living, social condition as a result of the political and economic changes and the transition to a market economy, to the number of undersized guard staff, local police agencies that have involved less (given the position of citizens against them), but also to long and frosty winters with high amounts of snow. If until 1990, the total volume of illegally tree cuttings is mostly reflected in the form of firewood, in the following period the quantity of illegally wood cuttings working has increased considerably, softwood being the most commonly affected.

These issues were identified mainly Transylvania, but also in Moldavia. We can also observe a decrease in the volume removed during 1996 - 2000, being found the decrease of the volume

of illegally tree cuttings on 8,751 m³, the annual average being of 1,750 m³, comparable to the period 1986 - 1990, but the share of the total wood volume is much higher, reaching over 50% and where, in addition to the softwood, it experienced a large growth in the valuable species (cherry, beach for veneer, ash, sycamore, resonance spruce). Thefts were extremely selective and well organized. In the interval during 2001 - 2005, the amount of damages has fallen to 6,742 m³, the annual average being 1,348 m³. The wood destined to manufacture recorded the biggest share of the recorded damages, being sought for further pieces of very good quality of the species, but compared to the previous period there has been a reduction (fig. 3).

The period 2006 - 2010 is characterized by the increase of the damage level recorded in forests up to 7,806 m³, with a yearly average of 1,561 m³. The damages were recorded mainly in areas in exploitation.



(a)



(b)

Source: original photo, 2009

Figure 3. The natural, artificial, or mixed restoration of forest areas affected by wind crashings, administered by the forestry authorities

The previously mentioned losses include all damages observed in Gurghiu Mountains and sanctioned by the forestry staff. They are composed by damages identified in state owned areas and private properties managed in Gurghiu Mountains.

With regard to the areas of forests and wooded pastures returned under the laws of restitution of property, they have been identified in numerous illegal actions of wood cutting.

Timber resulted from crashes produced by strong winds, was rated in the administered areas and disposed. From amounts obtained there were

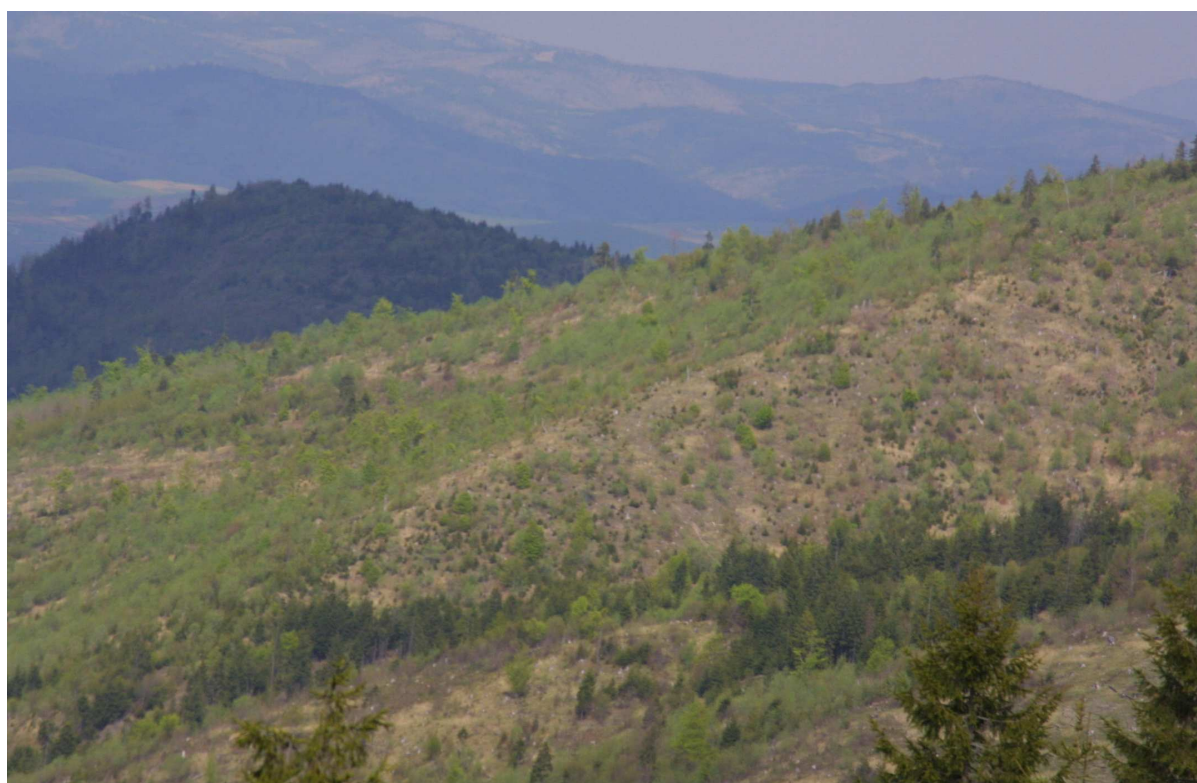
supported activities concerning forest restoration and regeneration, by pursuing the establishment and promotion of the fundamental natural forest type.

In forestry areas belonging to physical person type owners, especially on the East side of the Ghiurghiu Mountains in Remetea – Joseni area, there were not performed works of restoring for stands anthropically and entropically affected.

The installed natural restoration is composed mainly of pioneer species, and as consequence, these stands will become derivative stands with low production.



(a)



(b)

Source: original photo, 2006

Figure 4. The natural restoration of forest areas as consequence of illegal tree cuttings performed during 1995 – 2000 in private property forests, Remetea

5. Conclusions

The criteria used for estimation of the damages produced in the forests by increasing of the intensity of action of the anthropic factor in woods, take into account the size of the social and economical pressure on the forests produced by the local communities dependent on woods.

Among all analyzed factors concerning the anthropic impact on the forestry ecosystem, the illegal tree cuttings represent the most destabilizing factor in not managed forests owned by private persons.

The extremely strong anthropic impact identified through illegal cuttings in researched areas was advantaged by a series of factors as: accessibility, relative short distances to delivery points, permissive legislation, lack of the forestry administration.

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