

# **Physical Planning in Periphery Systems – Effects on the Forestry System in the Eastern Carpathians**

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**Key words:**

## **SUMMARY**

Of the different modalities of approach of such a topic on the physical planning in the regions situated at the periphery of the EU, our paper will focus especially on the empirical analysis of some of the most active layers of physical planning and will render evident the dissimilarities among them.

After the presentation of the general background of territorial planning in Romania as related to the situation in the UE, our paper approaches in detail some of the national features of the rural planning in the mountain region, emphasizing the fact that through a stratified and incongruous planning the levels arrive to annihilate each other.

Among the actors that structure the rural planning in the mountain region could be mention: the external economic agents, the local community, the church as institution and the European transportation routes.

The last part of paper deals with the fragile forestry fund systems in the Romania's Eastern Carpathians Range, which is influenced by the tensions between the main actors of the arrangement and territory planning, generating destructuring and restructuring chain on the ensemble of natural and anthropic systems.

# Physical Planning in Periphery Systems – Effects on the Forestry System in the Eastern Carpathians

Violeta PUSCASU, Romania

## 1. FORESTRY FUND IN ROMANIA

Although the Romanian territory stands for 2% of the European area (without CIS), it hosts five of the 11 natural vegetation zones found in Europe, and it has more than 500 types of natural forests accounting for almost 40% of the European floristic survey (Stoiculescu, 1990).

Romania is located in the southeastern part of the Central Europe, along the Carpathian arch mountainous and inferior course of the Danube (1075 km) as far as the Black Sea. Romania's territory stretches along 4<sup>0</sup>37'59" Northern latitude, at the crossing of 45<sup>0</sup>N parallel with 25<sup>0</sup> E meridian (National Institute of Statistics, 2000), on an area of 238,391 Km<sup>2</sup>, according to other authors and a population of more than 22.5 million inhabitants.

Romania's relief is characterized by a balanced distribution of areas according on their elevations (33% plains and riparian areas; 36% hills and plateaus and 31% mountains) as well as the concentric layout, like an amphitheatre of the natural relief areas. At the same time one can see the great deal of relief energy, the fragmentation and steep sloping terrain in the hilly region as well as in the mountainous one. Romania is covered by wealthy and diverse vegetation, wherein the forests stand for about 27% of the national territory.

This huge diversity comes from the country's geographical location, wherein various climates interfere: continental, south European, sub-Mediterranean and central European.

Romania is covered by wealthy and diverse vegetation, wherein the forests stand for about 27% of the national territory. This huge diversity comes from the country's geographical location, wherein various climates interfere: continental, south European, sub-Mediterranean and central European. The percentage of the forest fund of the country area is of 26.8%, and if considering the surface of the forest vegetation unincorporated in the forest fund (348 thousand hectares) it reaches 28.2 %, which is below the European average (29%) and far below other neighbouring countries (ex-Yugoslavia-36% and Bulgaria 33%) or those with similar climate and relief (Austria 45%, Czech Republic, Slovakia –36%).



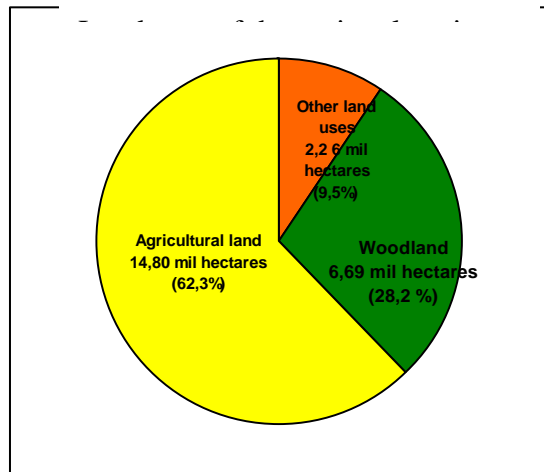
## **2. THE POSITION OF CARPATHIANS ARCH IN EUROPE**

Romania has an important position in Europe, being considered, in terms of forest resources and quality of wood products, a country with a sound forest policy, illustrated by a special interest for ensuring the perenniality of forest as well as continuity /sustainability of wood production based on legislative regulations according to which protection and preservation of forests is an estate matter. In accordance to the Law 26/1996 (Forest Code), safeguarding developing and securing the forest fund is a national priority for the public authority who is in charge with forestry. It is not allowed to diminish of national forest fund, either public propriety or private propriety.

## **3. EVOLUTION OF THE NATIONAL FOREST FUND STRUCTURE**

The forest structure (composition, density, type of structure and the manner in which trees are grouped) may influence the spirit in different ways. In principle, mixed and uneven-aged forests, in which the density varies more or less are more attractive than pure, even-aged regular stands. Broadleaved species are also more appreciated than resinous species, due to the variety of shapes, colors and light.

Although the surface of the forest fund diminished at the Romanian level forestry surface by about 2%, the percentage of forests increased by 9.6% due to the foresters' efforts to afforest the bare land and some terrains initially assigned to the foresters' husbandry.



The actual percentage of forests in Romania is unsatisfactory and far below the optimal percentage admitted by researchers (about 40%) to maintain the ecologic equilibrium and ensure the quality of life.

The reduced percentage of forests and their uniform distribution in the territory is a characteristic of Romanian forest fund with negative far-reaching consequences for the environment protection and agriculture production. The forests in the mountainous region are dominant (51.9%), and those in the plain account for only 10.9% of the total.

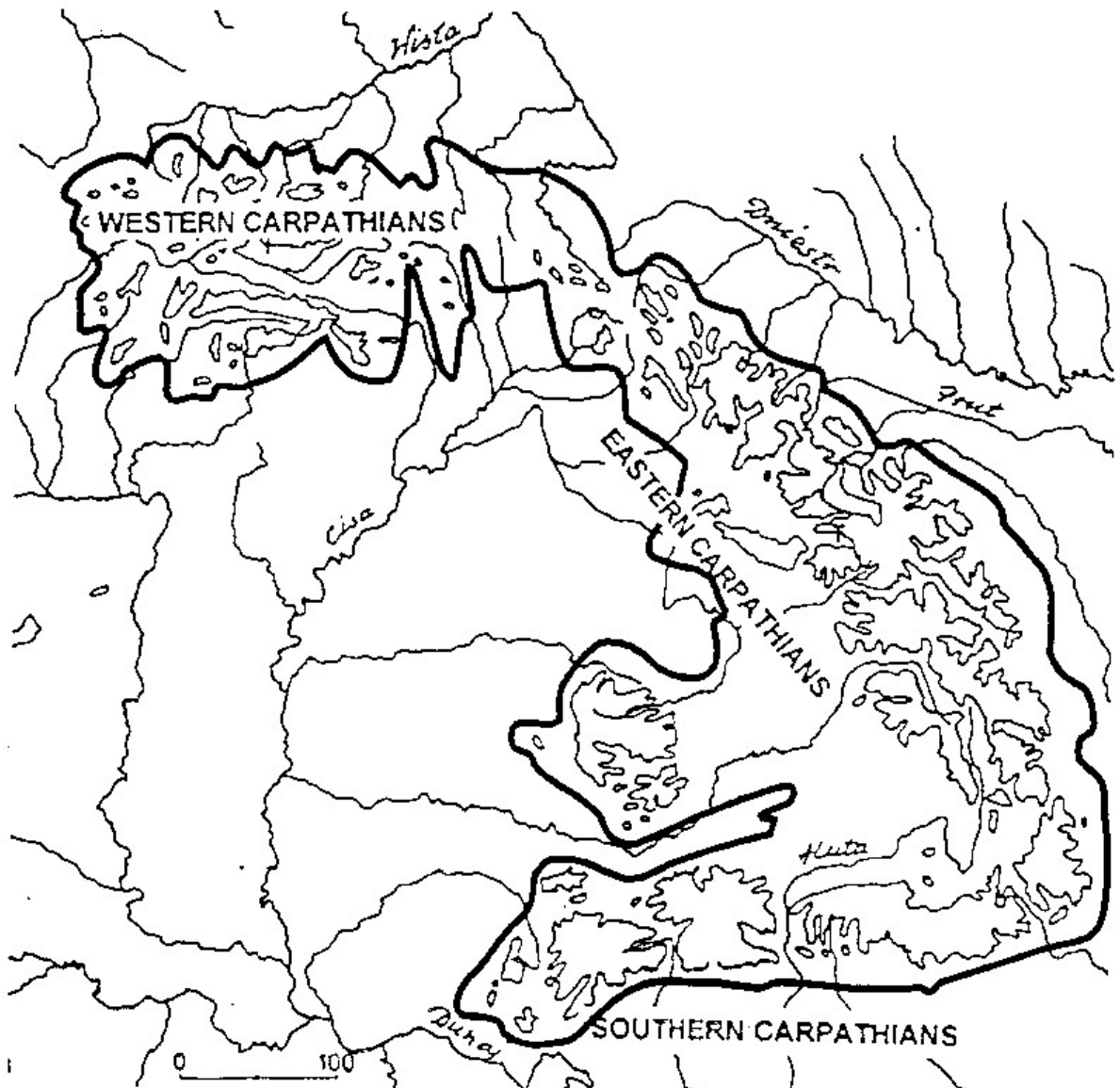
In the structure of Romanian forests the deciduous species lay on a (70%), with a major percentage for beech (31%) followed by oak species (18%), other hardwood species- maple, ash, cherry tree, walnut, elder, hedge maple, locust tree (16%) and softwood broadleaved species –lime, willow, birch, indigenous poplar, Euramerican poplar (5%). Resinous species lay on 1,852,690 hectares (30%), with a major percentage of spruce (23%), followed by fir (5%), pine (1.8%), Douglas fir and larch (0.7%).

As compared with the year of 1929 can note o reduction of 5% of deciduous species especially at beech (from 38% to 31%) and oak (from 24% to 18%) and a corresponding increase of resinous, especially the Norway spruce (from 19% to 23%) and other resinous – pine trees, (Scott pine, Douglas fir, larch (2%). The diminish of the surface of deciduous is due to the policy of increasing resinous portion of resinous species in Romania, which under the provision of ‘National Program for conservation and development of forests during 1976-2010’ promoted the pulp plantations of Norway spruce instead of beech onto its own natural area and pine cultures instead of low-yield oak forests.

Comparing to other European countries the action of increasing the share of resinous species within the Romania’s forest fund was weaker but replacing the naturally diversified stands with pure plantations of resinous species influenced negatively the stability of the forest ecosystems and diminished considerably their biodiversity. Similar negative effects were also recorded by setting up selected poplar cultures in the areas of indigenous poplar, but on a smaller area: 65376 hectares (1.5% of the deciduous area) in 1990 and 48992 hectares (1.2% of the area of deciduous species) in year 2001.

#### 4. THE EASTERN CARPATHIANS FORESTRY FUND

Position of the Eastern Carpathians in the Carpathians Arch



The Eastern Carpathians are limited in the West and in the East by lower hillock areas, by the Northern country border and the Prahova Valley under the shape of parallel peaks, getting lower and lower from the West to the East separated by a system of almost-geometrical valleys.

The spreading of the Eastern Carpathians on the 3,5 latitude is/makes-up another essential element in the landscape differentiation.

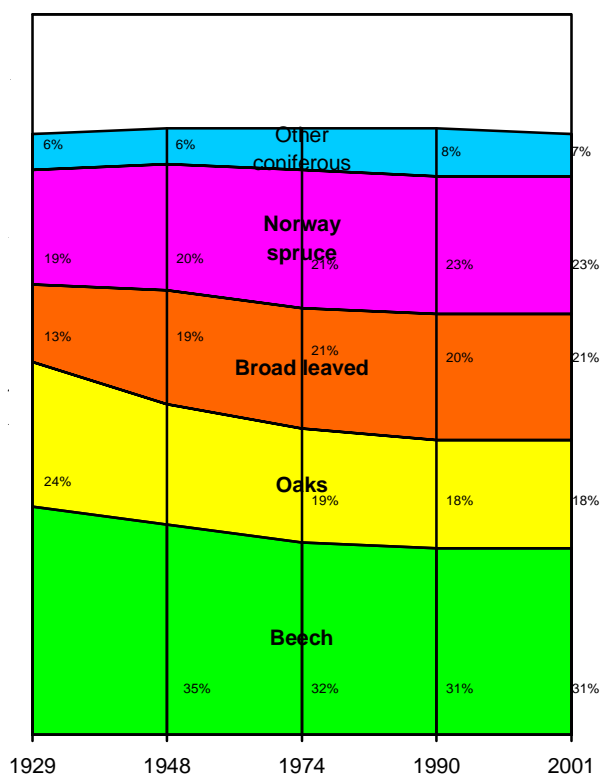
Here are some reference elements that shape the structure of landscapes: the superior/higher level of the spruce fir forest is situated at ~1730 metres, where the annual medium temperature is below 1,7°C; in the Vrancei mountains the mixed forests of spruce- fir, fir tree

and beech are maintained at 1600m and have an isle-like extension and the annual medium temperatures have higher values, respectively 3°C. The Western and Eastern fronts of the Eastern Carpathians determine different structures of the forestry fund: in the West, the spruce fir forests have an isle-like character climbing in the Tibles at 1400-1700m , with the prevailing of the spruce fir tree , that can climb up to 1600m ; in the East the mixed forests , of spruce fir tree and others resinous begin at 850-900m , so that beginning at 1300m only the spruce fir ones would develop/grow. The geographical landscapes of the Eastern Carpathians are discontinuous due to the valley corridors and to the depressions crossed longitudinally and transversely, as they hold 25,6 % of the carpathic mass, thus registering an obvious fragmentation.

The landed fund of the Eastern Carpathians is the result of long time antropic interventions grafted on the specific physical-geographical conditions . Within the Eastern Carpathians there are 40% of the country's forestry patrimony . The prevailing are the spruce fir areas especially in the Northern half and the fir tree and beech climb down from the sunny sides with extension in limitrophe hillock areas . It is frequently encountered the enclaving/isolation phenomenon of pastures at over 600 metres in the North with an obvious tendency of lowering of this altitudinal limit in the South of the Eastern Carpathians . The numerous/many intermountain depressions, an average of 48% of the intracarpatical depressions are situated at over 500m (altitude) determining a mosaic of agricultural fields and harvest meadows, adapted to low temperatures and with shorter phenological phases of development. The settlements in the Eastern Carpathians confirm, through the structure and their functionality the economic and traditional activities: the exploitation and the processing of wood and of the subsoil resources .

## **5. DYNAMIC OF THE FORESTRY FUND IN ROMANIA AND IN THE EASTERN CARPATHIANS**

In its history Romania's forests undertook an important spatial regress, gradually subsiding only during 1829-1930 - by 3 million hectares, (Toader, 2004) to extend the agricultural terrain, localities and public roads. Taking into account all the existing relative estimations until 1957, when the national forest fund managerial planning campaign was over, it is considered that the forest fund shrank the most when the Law of Agrarian Reformation came into force in 1920 and about 1.2 million hectares of forest were felled to enlarge the surface of rural meadows (MAPP, 2000). The Romania's forest fund the diminished after 1948 as well and it was recorded by the Forest Fund Inventory of 1974 a reduction of about 150 thousand hectares due to mainly communal forests felling which were given by the estate to the communities to supply the population with fire wood. The massive felling occurred in the oak forests in the plain regions where the wooden area was diminished from 24% to 18% across the country. During the afore-mentioned period (19<sup>th</sup>-20<sup>th</sup> century) the area of the beech forests diminished from 40% to 31% of the total surface of the forests.



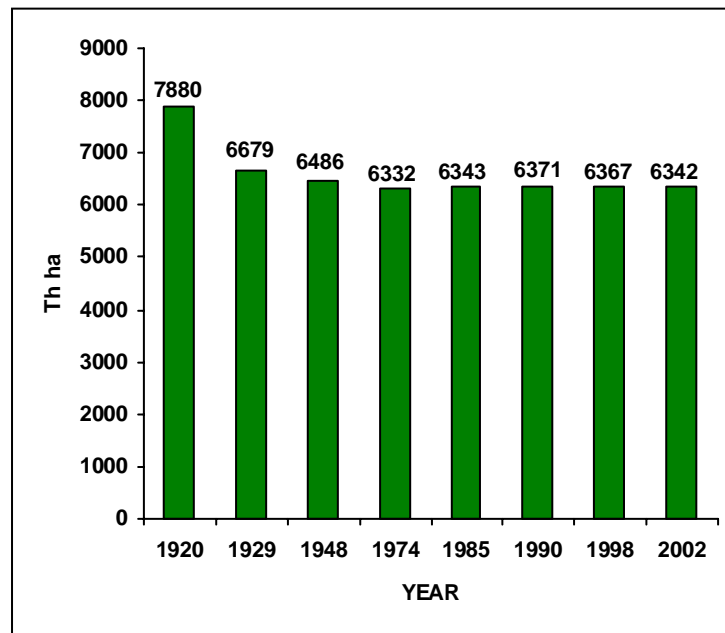
Dynamics of the surface and composition of the forests

The distribution of the forests by regimes highlights the orientation of the Eastern Carpathians' forest to substantiate the high forest share by applying the method of seed-based regeneration of older stands or planting new seedlings after clear cuttings in order to obtain diversified and uneven aged stands with valuable industrial timber grades. In the evolution of the structure of the forest propriety in Romania four stages could be considered: the first one, until 1948 when the forests belonged to communities or individuals; the second stage between 1948-1991 during which all the forests belonged to the state; the third stage 1991-2000 characterized by a property rights restoration process, when all persons who owned forests in the past were given 1 hectare of woodland, according to the Law of Land 18/ 1991 and the fourth stage up to the present; according to Law 1/2000 the propriety rights for all types of owners are being reinforced and about 2 million hectares of woodlands will go into private or community's property.

The excessive exploitation of the last 50 years split the forest massifs of Norway spruce and favored the windthroghts and snow breaks that diminished the growing stock with a volume of over 140 million m<sup>3</sup> between 1960 and 1989. The high productivity of the forest sites and the large share of valuable indigenous species (over 90%) located in natural areas of the main species (beech, oak, spruce, fir) have guaranteed a high production potential for the Romanian forests.

The forest allowable cut included in the decennial plan for main yield and wood volume foreseen to be harvested as secondary yields (tender and thinnings) is set up by forest

managerial planning works. Both works are deemed as important tools to optimize the forest structure and to normalize the age class structure for each forest.



Romania's dynamic national forest fund surface of the surface of the in Romania

Briefly, the main cause of a lesser allowable cut should be sought in systematical overexploitation of the last 50 years when the main yield had been exceeded with about 134 million m<sup>3</sup> (58 million m<sup>3</sup> of coniferous species), which means 23% overexploitation on the whole and 36 % just for coniferous species.

The overexploitation of the main yield allowable was possible due to adopting by the Government of Romania of some cutting rates (exploited volume) greater than the allowable cut in order to pay the dues to the former Soviet Union after the World War II and to provide the wood-processing industry with rough material as well as to export furniture to the European countries. The extra yield focused on accessible forest basins led to unbalanced forest age classes.

This is why periodic natural calamities have been recorded in Romania: catastrophic floods in 1970, 1975 and 1999, the long-lasting droughts during 1942-1953, 1983-1993, the strong storms in the mountainous area in the counties of Covasna, Harghita, Mures, which resulted in 10 million m<sup>3</sup> windthroughs at the end of 1995, or the most recent one, occurred in 2001 in the counties of Suceava and Neamț. All these events have triggered the soil erosion and flush floods.

The majority existence of natural stands consisting of natural regenerated species and suitable from the site viewpoint ensure a great stability and a great biodiversity of the forest ecosystems and highlights the sustainable development of Romanian forest policy according to the principles of ecological silviculture.



In a few words, Romanian forests were moderately damaged in 1990 (13 %), the draught during 1993 and 1994 caused severe damages while the health improved between 1995 and 1999, when the share of severe damaged trees was smaller.

According to Simionescu et al (2001) between 1986 and 2000 30,6% of the Romanian forests were affected by pest, that is an average annual area of 1899.8 hectares. The most influential factors (84.9 %) were insects, plant parasites, rodents while the less influential ones were weather conditions such as wind, snow, draught, frostiness, pollution, acid rains, and floods, responsible for 15 % of the damages. Researches that have been carried out in the field of forest dieback (Patrascoiu et Badea, 1995) have concluded as follows:

- Resinous species and beech stands are much more resistant to biotic factors, comparing with the oak stands that had been affected by intensive exploitation and overgrazing.
- A noteworthy dieback occurred within poplar plantations and willow stands that had been installed along interior rivers, beyond the dams of hydro electrical power.
- Serious dieback occurred in Norway spruce and pine plantations wherever these species had been installed beyond their natural vegetation areas.
- More died trees are to be found wherever stands had been affected by overexploitation or overgrazing. Forests have been seriously disturbed by numerous windthrows and snow breaks.

According to the official statistical data the rate of forest dieback is not worrying and a strong evidence in this respect is the situation recorded between 1991 and 1993: between 401 and 457 thousand hectares were affected to different degrees by forest dieback (about 7% of the woodland), of which only 0.3% stood for severe damaged forests, about 1.2% stood for medium damaged forests and 1.5-2.3% were affected by the early symptoms of dieback.

The forest belt is located in the Carpathian Arch and in hilly regions and, of course in the Eastern Carpathians. The superior limit of the forest (1500-1800 m), being the largest and the most representative in terms of number of forest species. Beech (*Fagus sylvatica*) stands for a main forest species of the stands of Romania, covering around 31% of the surface of the forests. Through the upper limit of the beech belt there are mixed forests (broadleaves and coniferous) beech and Norway spruce, beech with fir tree or beech with fir tree and Norway spruce. Coniferous sub-region is characterized by stands with persistent and evergreen leaves in which spruce prevails (*Picea abies*) and to a lower extent fir trees (*Abies alba*). The inferior limit of coniferous is arising from the west side of eastern Carpathians to the East side of them. In the Middle Carpathians and in the southern part of the Eastern Carpathians the coniferous sub-region is fragmented and not so well represented. Other coniferous species that grow in eastern Carpathians are: larch, located in six centres in Ceahlău and Tarcău; Swiss pine (*Pinus cembra*) that grows in Călimani and Rodna; pine (*Pinus sylvestris*) spreads in the inferior part of the Norway spruce area, perched on the rocks or in peat bogs (Poiana Stampei-Suceava) (Donita, 1992).

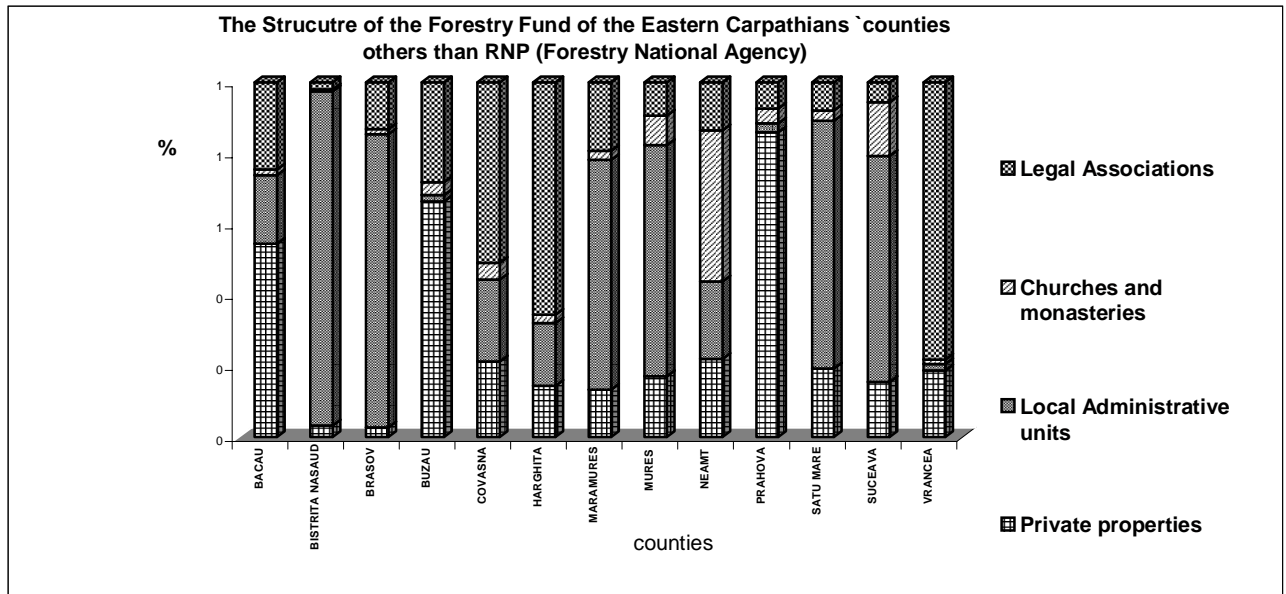
From the analyses of the structure of the Eastern Carpathians forestry fund on counties level it is noticed a variety of situations as follows: the most important surfaces that belong to the Juridical Associations are to be found in the counties of Covasna, Harghita and Vrancea holding over 50% of the total forestry fund of these counties.

The forest that belong to the *local administration units* have a very high percentage in the counties of Brasov and Bistrița – Năsăud, of over 80 % as well as in the counties of Maramureș , Mureș, Satu Mare and Suceava.

The forests that at the present belong to the *churches and monasteries* have relative low percent in the total forestry fund of those counties, with the exception of the counties of Neamț and Suceava. In the case of the Suceava counties, trough by successive action of the process of ownership (giving back their forest, from ancient time) of the Archbishopric of Suceava and Rădăuți it has come to the point that at the present, in January of 2005, it holds 28% of the total forestry fund of the county.

In comparison with these situation, the *private properties* of the forestry fund register higher percentages in the counties of Buzău, Prahova, Bacău, having over 60% and modest values, under 20% in Covasna, Harghita, Maramureș, Mureș, Neamț, Satu Mare, Suceava, Vrancea. This Strucutre refers to the forestry fund outside of the state forestry fund. The presentation introduction of this situation an of the chart points out the fact that there are very heterogeneous counties from the point of view of ownership type (Suceava, Satu –Mare, Neamț, Harghita, Covasna, Bacău) in comparison with the counties of Bistrița – Năsăud, Vrancea where there is (to be found) a higher percentage of an ownership type .

Also, from this presentation results the creation of some new spatial organization system and planning owner territory of the forestry fund, which could generate a series of local or regional tensions. There are numerous example where it were compositional restructuring of the forestry fund as a result of the chain of ownership of the forest as a result of the process of the changing their owner, from state to above mentioned type of owners without always ensuring a coherent planning management.



Romania`s Forestry Fund Management

Romania is a European country, which has been, is stocked with important and diversified forest resources due to a sound and sustainable forest management. Forests have been managed according to a managerial planning national system, which has encompassed the whole forest fund since 1948. All environmental aspects of forest management have concerned the Romanian forest scientific community and the ecological principle has been stated as well (Giurgiu, 1978, 1988).

Forest Codes issued in 1881 and 1910 advocated for managerial planning both for public and industrial private forests, while non-industrial private forests were exploited according to harvesting outlines. For financial and technical reasons the whole process took place with slow paces and only 39% of the forest fund were covered with managerial plans in 1948 (Carcea and Dissescu, 1995), although some other authors have noticed a larger share, 51% respectively (Toader, 2004).

After forest nationalization in 1948 the managerial planning campaign has been intensified and it ended up in 1956, afterwards being the managerial plans being updated each ten years. In 1962 the Forest Code was updated while the technical standards for managerial planning were updated according to research findings (1951-1953, 1959, 1969, 1980, 1986 and 2000).

Following the concept of sustainable development launched at inter-ministerial conference on forest conservation in Europe (Helsinki, 1993) along with the pan-European criteria and indicators for sustainable forest management (Lisbon, 1998), the achieved level of sustainability will be checked as follows: biodiversity preservation, avoidance of human activities that may threaten forest ecosystems, protection for old-growth forests, promoting indigenous valuable species, both in economic and ecological terms, healthy state of forests, the degree to which forests structure has been diversified due to natural regeneration and shelterwood systems.

During 1948-1989, 2493 thousand hectares were reforested, of which 1156 thousand hectares (46%) plantations with resinous species. In this way the regeneration class (750 thousand hectares) was integrally reforested and the share of closed forests increased from 88.3% in 1948 to 98.4 % in 1989. Ecological restoration of degraded was also carried out along with replacing low productive stands with better ones on 940.8 thousand hectares (77.9% of the 1208.5 thousand hectares came from underproductive former private properties).

At the same time, fast growing species were planted on 800 thousand hectares, of which 550 thousand hectares with coniferous species (Norway spruce, pine, Douglas fir, larch) and 250 thousand hectares with broadleaved (poplar, black locust, selected white willow).

After 1989 the area regenerated in the forest fund has continuously decreased from 54,104 hectares in 1989 to 21,806 hectares (40,5%) in 1998), following a lower allowable cut: from 20-24 million m<sup>3</sup> /year to 12-16 million m<sup>3</sup> /year at the present. Artificial regeneration was less and less required due to shelterwood systems (Toader, 2004).

The natural regeneration of forests faced major hardships, caused by the overexploitations on large areas without any sustained preoccupation for natural regeneration.

Forest management certification in Romania and in eastern Carpathians, also regarded as forest certification, is a new challenge for the forestry, which has been initiated in 1993 by the Forest Stewardship Council. This international organization (gathering forest companies, forest owners non-governmental organizations and other different institutions) developed economic, ecological and social principle and criteria for sustainable forest management.

More certification schemes have been developed recently but the FSC system seems to be the most important one, although in Europe the Pan European Forest Certification Council has developed its own scheme few years ago. In 2003 the PEFC gave up its European background and turned into a forest certification system acknowledging, that is a global certification program. Having more options for certification, the forest owner has to contemplate all economic, ecological and social aspects, FSC being the one that meets both ecological and social goals in an appropriate way.

Nowadays, especially in western countries (Great Britain, Austria, Belgium, Denmark, Switzerland, France, Germany, Italy, the Netherlands, Spain, Sweden) and the Northern America, hundreds of logging, wood-processing and retailer companies have assumed to purchase and sell wood and wooden products from FSC certified forests only.

For Romania the forest certification is advantageous in two ways:

- Contributes to bettering the forest management in terms of applying silvicultural works, diminishing illegal cuttings and poaching, supervising the flows of rough material a better visibility of the forest management, nature protection and international recognition for all the efforts carried out by the forest administration in all these respects.

- Access on the western markets wherein more and more certified wood and certified wooden products have been demanded. For numerous companies operating in Romania it is still impossible to meet some specific demands (furniture, lumber, and stratified panels) coming from the western countries.

Along with that the image benefit is also welcome in a commercial context wherein all stakeholders are paying more and more attention to the forest sustainability issue.

In recent years numerous Romanian or foreign companies have expressed their interests in purchasing wood from certified forests. Therefore the National Forest Administration has kicked off in 2001 the certification process with the two forest districts of Eastern Carpathians, in Văratec and Târgu Neamț, with a total allowable cut exceeding 100,000 m<sup>3</sup>, both of them being included into the Vânători Neamț Forest Park. The two forest districts were pre-assessed 2001 and effectively evaluated in 2002 by a certification body agreed within the FSC framework. Issuing the two FSC certificates in June, 2002 proved the sustainable forest management applied by the National Forest Administration and highlighted, at the same time, some managerial issues that must be improved in order to meet the certification criteria. Thus it has turned out that more care is needed in approaching the environmental issues of forest logging along and across the water bodies, in reducing the rate of damaged remaining trees, in identifying the forests with high protection values, in providing labour security and getting the local communities more involved into the forest management (Toader, 2004).

Having in mind the Romania's economic interests and the need to enter the western markets with certified wood,, the Ministry of Agriculture, Food and Forests came up with the proposal (approved by the Government in December 2002) to trigger the forest certification process regardless the ownership type in accordance with legal provisions.

Foreseeing the certification process, some Romanian companies created with foreign capital have certified their chains of custody till the beginning of 2002. As the Romanian Forest has triggered the certification process for eight forest counties and announced the determination to certify all the public forests, more and more logging companies are interested in certifying their chains of custody.

All these efforts may be regarded as important paces in promoting abroad the country's economic interests and bettering the sustainability of the forest management.

## BIBLIOGRAPHY

- The National Forestry Administration (2004), *National Forest of Romania . National and Natural Parks* , Editat tipografia Intact, Bucuresti.
- Geografia României -The Geography of Romania*, vol I, II , Academy Publishinghouse, Bucharest
- Doniță, I, et col. (1992)- *The vegetation of Romania*, Editura tehnică și Agricolă, București
- Giurgiu, V. (1998)- *Amenajarea pădurilor cu funcții multiple*, Ed. Ceres, București
- Puscasu, Violeta (1999)- *Urbanism and urban planning* , Editura Arionada
- Toader, T. (2004), chapters Romania`s Forest in National Forest of Romania. National and Natural Parks , Editat Tipografia Intact, Bucuresti.

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