ECOTOURISM AND ENVIRONMENTAL CHANGE IN THE ROMANIAN CARPATHIANS

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Abstract

The Carpathian Mountains still preserve a wide diversity of quasi-natural landscapes, most of them protected within national and natural parks. The entire Romanian Carpathian Chain holds 22 major protected areas that total approximately 1 million hectares, among which 8 natural parks, 12 national parks and 2 geoparks. They constitute a favourable background for the multitude of existing tourist resorts and the development of a wide range of tourism activities.

The development of ecotourism relies primarily on the natural and human potential of the Carpathians and is related to the European Union initiatives in this field. For the beginning, few nuclei were materialised, combining the attractiveness of national and natural parks with ethnographic traditions.

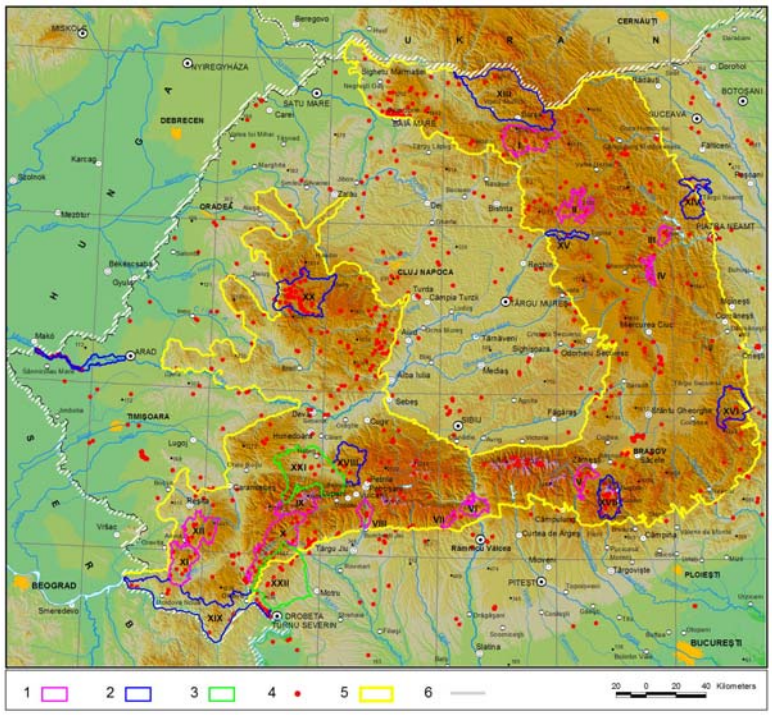
Environmental and socio-economic change in the Carpathians are including climate change, biodiversity loss, management of shared water resources, trans-boundary air pollution, trade in endangered species and waste disposal with a direct impact on ecotourism.

Key words: ecotourism, environmental changes, protected areas, Romanian Carpathians

Introduction

The Carpathian Mountain Chain, the longest in Europe, crosses eight countries, with over 50% extending in Romania, where the wealth of its natural environment and the ethnographical traditions represent a major tourism development asset. Ecotourism is a form of tourism in which the main motivation for the tourist is the observation and appreciation of nature and of local tradition in natural areas.

The main goal of ecotourism in Romania is conservation and preservation of the natural heritage, especially in protected areas, securing financial and cultural benefits for the local communities (from selling hand-made items and home-made foods, providing tourist accommodation in traditional households, using traditional means of transport – carts, horses) and supplying local guides. A characteristic feature of ecotourism, still in an early stage, is the formation of the so-called "ecotourism nuclei" of a great regional diversity. There are numerous groups of initiative engaged in promoting and developing ecotourism. The major ecotourism destinations are the Carpathian Mountains with their protected areas (Fig.1) and the Danube Delta.



Legend: *1. National Parks:* I. Rodna Mountains, II. Călimani, III. Ceahlău, IV. Bicaz Gorge - Hăşmaş, V. Piatra Craiului, VI. Cozia, VII. Buila-Vânturarița, VIII. Jiu Defile, IX. Retezat, X. Domogled-Cerna Valley, XI. Nera Gorge - Beuşnița, XII. Semenic-Caraş Gorge; *2. Natural Parks:* XIII. Maramureş Mountains, XIV. Vânători Neamț, XV. Upper Mureş Defile, XVI. Putna, XVII. Bucegi, XVIII. Grădiştea Muncelului-Cioclovina, XIX. Iron Gate, XX. Apuseni; *3. Geoparks:* XXI. Dinosaurus Geopark Hațeg Land, XXII. Mehedinți Plateau Geopark; *4. Natural protected areas; 5. Carpathian limits; 6. Country boundaries*.

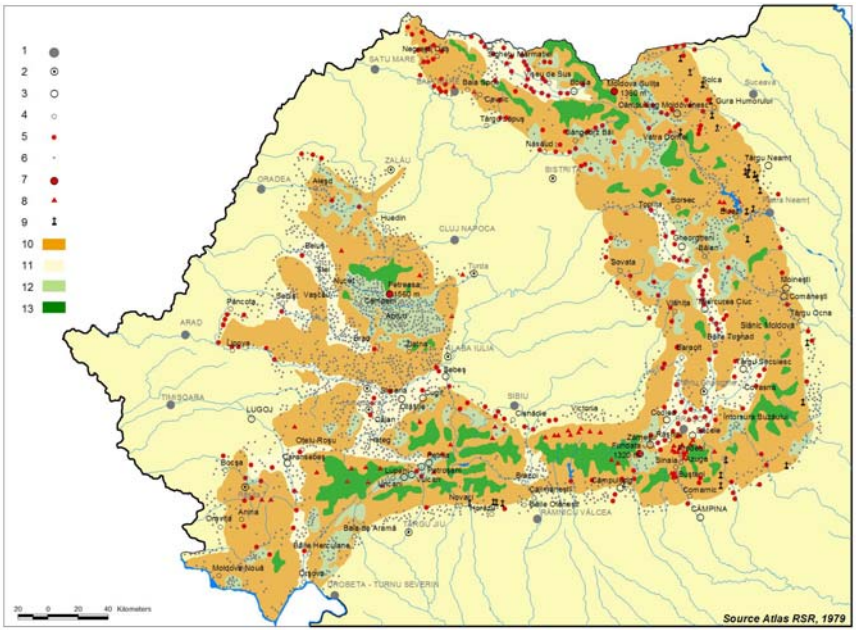
Fig. 1 Natural protected areas in the Romanian Carpathians.

1. Geographical setting

The Romanian territory, situated in the South-Eastern part of Central Europe, in the lower Danube Basin, holds the largest sector of the Carpathian Chain. These mountains still preserve a wide diversity of pristine landscapes, most of them protected within national and natural parks there are an exquisite background for the multitude of existing tourist resorts and the development of a wide range of tourism activities.

Unlike the Alps, the Carpathian Mountains are less elevated, more fragmented by transversal valleys and numerous depressions, and also more populated. The Romanian Carpathians cover 66,300 km², are 900 km long, average height 1,136 m, and 2,544 m absolute altitude (Moldoveanu Peak). They include the longest volcanic range in Europe, with over 2,000 mineral springs and many spas and health resorts associated to them (*Romania. Space, Society, Environment*, 2006).

The climate is temperate-continental with oceanic influences. There are three altitudinal zones: *high mountains* (1,800 – 2,500 m) and their alpine and sub-alpine belts with spectacular landforms – ridges, glacial cirques and glacial valleys, large leveled surfaces covered with alpine meadows and lots of relict and endemic species; *middle mountains* (800 – 1,700 – 1,800 m), housing Central European and Boreal forest ecosystems, display three vegetation belts– spruce, deciduous mixed with conifers and beech; *low mountains* and *intra-montane depressions* (500-800 m) whose landscapes have been severely modified by human activity (*Carpathians Environment Outlook, 2007*). Since conditions in the Carpathian Mountains are propitious to habitation, settlements are seen up to 1,300 – 1,400 m altitude (Fig.2).



Legend: *Towns: 1.* > 100,000 inh.; *2.* 50,000 – 100,000 inh.; *3.* 20,000 – 50,000 inh.; *4.* < 20,000 inh.; *Villages: 5.* > 2,000 inh.; *6.* < 2,000 inh. *7.* Permanent settlements at high altitudes; *8.* Hotels and chalets; *9.* Massifs; *10.* Intra-montane depressions; *11.* Scattered permanent or temporary settlements; *12.* Sheepfolds.

Fig. 2 Settlements in the Romanian Carpathian Mountains.

Man's impact on the mountain space has produced specific landscapes: forest, pastoral, agro-pastoral and industrial (mining-related) ones. They all have a remarkable tourism potential, but each gives a distinctive response to environmental change. Pastoral and forest landscapes, with their ethnographic traditions (shepherding) and civilisation of the wood, respectively are of particular tourism interest.

2. The concept of ecotourism

Although a recently developed term, ecotourism is a much debated topic that has a whole literature devoted to it. Many theoretical approaches to defining ecotourism have been made, trying to cover all its aspects. One of the first definitions accepted by the international scientific community is Ceballos-Lascurain's (1996), according to whom ecotourism means "traveling to relatively undisturbed or uncontaminated natural areas with the specific objective of studying, admiring, and enjoying the scenery and its wild plants and animals, as well as any existing cultural manifestations (both past and present) found in these areas" (Dinu, 2005). Fennell also defined ecotourism as evolution, "where many places and people independently responded to the need for more nature travel opportunities in line with society's efforts to become more ecologically minded" (Fennell, 2003). Later on, discussions focused on the overlapping terms of *nature-based tourism* and *ecotourism* and definitions tried to make a distinction between the two concepts. As the literature on sustainable tourism enlarged, such notions as *appropriate*, *eco-*, *soft*, *responsible*, *small-scale*, *green* tourism were advanced as alternative forms of tourism to the classical forms, generally seen as mass tourism, developed into *movement* and finally into *convergence* phases (Clarke, 1997). Moreover, ecotourism, said to be the core of the sustainable tourism concept, was also blamed to be the opposite, entailing negative consequences for pristine natural areas (Swarbrooke, 1999; Page and Dowling, 2002). Comparing the different definitions of ecotourism by certain selected variables, Fennell's scheme shows that most of them highlight an interest in nature, the contribution

of ecotourism to conservation, reliance on parks and protected areas, the benefits for local communities and long-term advantages; some would pinpoint on education and the study programmes that comprise a code of ethics, the fact that ecotourism is a low-impact/non-consumptive form of tourism, that it is sustainable and based on a management system, while just a few definitions would speak also of enjoyment, culture, adventure and small-scale tourism. Nevertheless, ecotourism has also been connected, both in theory and in practice, with adventure and cultural tourism.

The International Ecotourism Society defined ecotourism as *the responsible travel to natural areas that conserves the environment and improves the well-being of local people* (International Ecotourism Society). The European Travel Commission has adopted this point of view, as well as the definition given by the World Conservation Union in 1996 which described this form of tourism as *visitation to relatively undisturbed natural areas ... has low negative visitor impact, and provides for beneficially active socio-economic involvement of local populations,* at the same time emphasizing the necessity to distinguish between the concepts of ecotourism and sustainable tourism. The definition adopted by the Association of Romanian Ecotourism is based on the definitions and principles of ecotourism accepted by the international community, and states that ecotourism is *a form of tourism in which the main motivation for the tourist is the observation and appreciation of nature and of local tradition in natural areas; this type of tourism must fulfill the following conditions: to contribute to nature conservation and protection; to support the well-being of local people, with emphasis on local ownership and business opportunities for local people (especially in rural areas); it also should have an educational component that develops awareness about nature conservation, both for tourists and local communities, and exerts the lowest possible negative impact on the environment and on the socio-cultural component.*

3. Ecotourism in Romania and in Europe

Protected areas with their environmental and cultural values are becoming more and more attractive for the growing European tourism sector. The number of ecotourists keen to experience an unspoilt natural and cultural setting, rural tourism, outdoor activities, or well-being programmes is on the increase as policies and programmes of environmental protection are more active and tourism-developing programmes focus on impact issues. Eco-labels awarded for various environmentally-friendly tourism services and products, as well as European initiatives and networks of protected areas such as Natura 2000, PAN Parks, IUCN Parks for Life based on EU directives, are ever so popular. The network of Romanian protected areas integrates well into the political and legislative context of Europe and the above-mentioned networks. Only Retezat National Park holds a PanPark Certificate, while Rodna Mountains National Park is just going to receive one. Noteworthy, Piatra Craiului National Park has been awarded the *European Diploma of Protected Areas*, and this important distinction will soon be granted to Retezat National Park.

Since 2007, Romania is part of "Natura 2000" European Network which contains 273 community sites (3,291,854.6 ha) and 108 specially protected avi-fauna sites (2,988,713.6 ha) totaling 6,280,568.3 hectares.

The main ecotourism destinations are the protected areas which, according to the IUCN classification, fall into Category V and Category II, respectively. The National Park (Category II) management has in view ecosystem protection and recreational activities, while the Natural Park/Protected Landscape (Category V) management objective, inscribed in European legislation, is landscape conservation and recreation, within an area where people's interaction with nature is in harmony. From a "nature-related interest" perspective, the Laarman and Durst scheme shows national parks to correspond rather to the hard dimension of ecotourism, and natural parks to the soft dimension; on the other hand, in terms of "physical rigour", there are cases when also natural parks correspond to that hard dimension.

4. Environmental change in the Romanian Carpathians

Changes in the Carpathians are related to global environmental change and to regional and local socio-economic transformations.

Many of the major environmental challenges Carpathian countries are being faced with in the early 21st century are of a global or trans-boundary nature, including climate change, biodiversity loss, management of shared water resources, trans-boundary air pollution, trade in endangered species and waste disposal (*Carpathians Environment Outlook, 2007*).

The Carpathian forest management system emphasizes the impact of extreme droughty periods and of acid rains on forests and trees. According to Alexandrescu *et al.* (2003), most affected were the leafy forests; among resinous species it was the fir-tree that was hit by severest defoliation (p. 107). Changes in the general conditions of mountain environments will probably drive cold weather species to higher altitudes (Keller *et al*., 2000; Theurilat and Guisan, 2001). Thus, the timberline is a good climatic indicator in terms of variability in the temperature regime. Climate warming trends in the Carpathians led to "a modification of altitudinal belts and a tendency of an upward shift of the timberline" (Bălteanu *et al*., 1987, p.38), as well as an intensification of erosion and landslides.

Significant environmental changes are already affecting the Romanian Carpathians natural ecosystems given that precipitation extremes (e.g. heavy rainfalls triggered by greater local atmospheric instability; liquid precipitation overlapping the snowmelt process due to temperature rise) are a favourable soil erosion factor.

The last IPCC Report (Trenberth *et al*., 2007) indicated an increase rate of 0.74°C in global mean surface temperatures over the last 100 years (1906–2005), while the rate of warming in the past 50 years almost doubled that of

the last 100 years (Trenberth *et al*., 2007). In Europe, the annual mean temperature rose more than the global average recorded since 1900 (+0.95ºC), and more in winter (+1.1ºC) than in summer (0.7ºC) (EEA, 2004).

4.1. Climate trends

From the data provided by long-term meteorological observations the effects of global warming on Romania's climate are obvious (Busuioc, 2008). A mean temperature increase of +0.5ºC registered in Romania over the 1901-2007 period of observations, affected mostly the Extracarpathian regions (*Carpathians Environment Outlook,* 2007).

During the 1961-2007 period, most stations recorded higher annual average temperatures in the northern and western mountain regions, and unusual weather warming over most of the mountain areas in summer and winter (Fig. 3).

Variability figures for that period show a winter tendency to milder weather and a warming process during the snow season with a negative impact on ski resorts. Many studies show that most winter warming might be related to the large scale-circulation patterns, such as NAO (Hurrell, 1996), even though local and regional factors still play a more important role in the Romanian Carpathians than in other mountains (e.g. the Swiss Alps) (Bojariu and Dinu, 2007). However, a strong positive NAO index phase led to a very warm 2006-2007 winter, which was indeed one of the mildest ever recorded in Romania, both at low and high-altitudes. Within a global context, the snow cover duration in the Romanian Carpathians indicates visible decreases at low and median altitude sites (below 1,500 m), especially in the Southern Carpathians, with estimated variation rates of 6 to 8 days/decade, between 1961 and 2003. The snow season tends to stay on longer in the alpine realm (estimated variation rate up to 11 days/decade).

Annual precipitation trends in 20th century in Europe showed significant differences between Northern and Southern Europe (10–40 % wetter and up to 20 % drier, respectively), and winter changes in most parts of the continent (EEA, 2004). The Romanian Carpathians featured greater spatial variability and heterogeneity with altitude and the general atmospheric circulation which shaped the distribution of precipitation over the 1961-2007 period (Fig. 4).

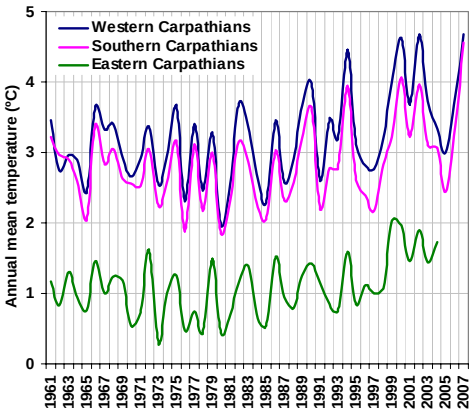


Fig. 3 Annual mean temperature over the 1961-2007 period in the Romanian Carpathians.

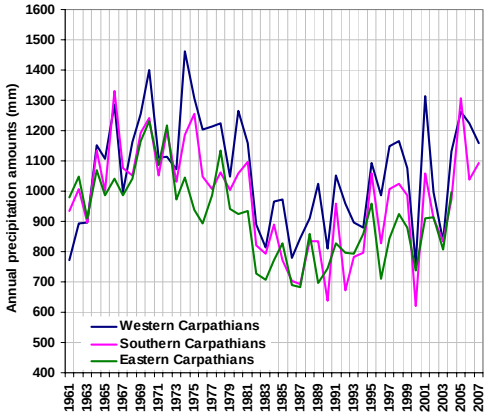


Fig. 4 Variability of annual mean precipitation in the Romanian Carpathians.

The Romanian Carpathians experienced a general decrease in the precipitation regime and most weather stations registered significant falls (>50%). In many areas, the last decades of the 20th century indicated a general tendency toward a drier mountain climate. However, the beginning of the 21st century, basically 2005, brought about large annual precipitation amounts in many regions, with highest values and positive deviations in the Southern Carpathians (e.g. Sinaia 1,628 mm/year, Predeal 1,361 mm/year and 57% and 43% respectively, from the 1961-1990 mean) comparatively with the other Carpathian branches.

Analysing the variability of climate extremes, Boroneanț *et al*. (2004) speak of significantly lower annual quantities of precipitation, especially in the Southern Carpathians which are strongly influenced by the south-western circulation (45 mm/decade at Omu Peak - the highest weather station).

Snow depths variability at high altitude registers a statistically significant downward trend only in the Apuseni Mountains (Western Carpathians) and in the north-eastern part of the Eastern Carpathians (Bojariu and Dinu, 2007).

In most parts of Europe, the past 100 years featured fewer cold and frost days, and more frequent summer days and heat waves (EEA, 2004). The cold extremes in the Romanian Carpathians, mostly above 1,000 m altitude, also tended to decrease (air frost days), except for some elevated Eastern Carpathians areas, where cold winters have still been recorded. The shortest air frost duration was recorded in the Southern Carpathians, during mid-1990s, with deviations of 110–69 days from the multi-annual mean.

As the majority of previous studies have mentioned, winters in the Romanian Carpathians tend to become warmer, especially at stations influenced by humid airflows, and in forest belt ones, which appears to be more sensitive to temperature fluctuations than alpine and sub-alpine areas.

4.2. Climate change projections

In the latter half of the 20th century, the warming process in Romania showed up in a rise of maximum temperatures, a fall of diurnal thermal amplitude and exceptionally high quantities of heavy rainfalls with severe flooding episodes in some regions, and high temperatures and lack of precipitation and severe droughts in others. The effects of these changes are felt particularly in mountain regions, because of their natural environment is very fragile and highly sensitive to any amplitude and swift climate change both at present and in the future (Keller *et al.*, 2000, Bălteanu, 2003).

The Romanian Carpathians and their ecosystems are a source of goods and services for society, e.g. fresh-water supply, carbon storage, protection from natural hazards and tourism-related activities. However, climatic conditions might provide ecotourism opportunities but also constraints.

Further global warming (+0.1ºC/decade) over the next two decades of the 21st century is expected, in case all climate forcing agents are maintained constant at the level of the year 2000. Regional Climate Model simulations of future climate change in the Romanian Carpathians, have shown that winter precipitation (B2 and A2 IPCC scenarios) are likely to increase by 40-50 mm (Busuioc *et al*., 2006a). Regarding extreme temperatures, Busuioc *et al.* (2006b) determined significant signals mostly for winter minimum temperatures (A2 IPCC scenario) in that stronger warming will occur in the Eastern Carpathians (>5ºC) than in the Southern and South-Western ones (4.5-5ºC) (*Carpathians Environment Outlook*, 2007).

In regard of climate change, variability and impact in Central and Eastern Europe (FP6 Clavier Project[1]), similar outputs were obtained by preliminary climate simulations results by using REMO 0.22º model driven by ECHAM5/MPI-OM global model simulations, for A1B IPCC scenario over the 2001-2100 period. According to these results, temperature is expected to increase, particularly in May-August, while precipitation might register greater changes over the 2071-2100 period (increases in autumn and winter and decreases in spring and summer) (Fig.5).

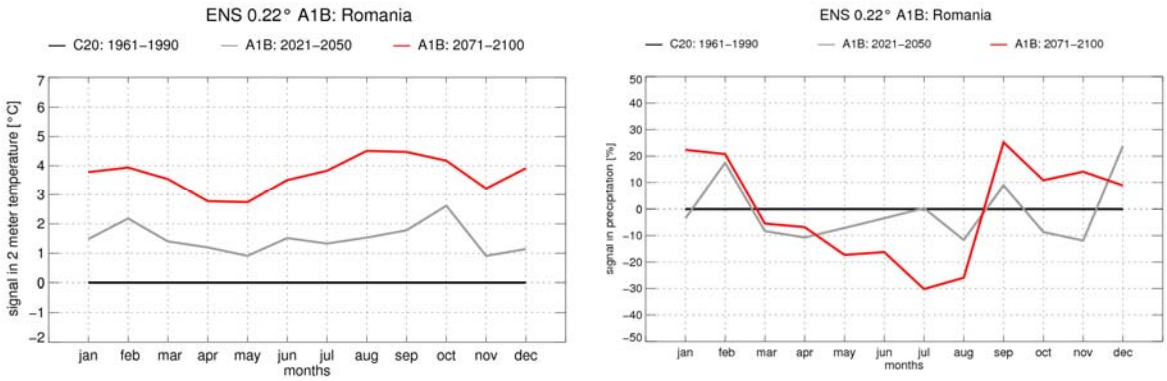


Fig. 5 Temperature and precipitation trends in Romania according to Clavier REMO 0.22º simulations, under A1B scenario (Max-Planck Institute for Meteorology, 2008).

Under the ongoing warming process, climate simulations indicated a significant shortening of annual snow-cover duration, especially in the western and north-eastern part of the Romanian Carpathians, where supposedly more frequent winter flooding and a rise of the snow line, as well as an obvious decrease of river discharge in summer would occur in the future.

4.3. Human pressure on the environment

Besides climate change signals, significant environmental change in the Romanian Carpathians is also expected, mainly through deforestation and over-grazing, threatening the natural equilibrium of mountain ecosystems in protected areas which offer good ecotourism opportunities.

Biodiversity loss is a topical problem of many natural habitats and the Carpathian Mountains make no exception. The number and diversity of vegetal and animal endemic species in the Romanian Carpathians are in jeopardy, due to climate change, air and water pollution, upgrading of the transport infrastructure, extending all types of built-up environment and urbanization schemes, changes in agriculture and forestry ("a lack of dead wood implies a significant lack of biodiversity"), hunting and poaching and, last but not least, inappropriate tourism management. (*Carpathian Environment Outlook*, 2007)

Forest resources, a main component of the Carpathian environment, has suffered major changes over short periods of time due to the economic and political transformations brought about by the transition period. The new land laws passed thereafter sanctioned private property and unfortunately paved the way to deforestations.

Thus, under Law 18/1991, each former owner, but also other members of the local community who had not possessed forest land before the communist regime came to power, were entitled to receiving 1 forest hectare. The result was fragmentation of forest property and deforestation, moreover so, as Law 26/1996 stipulating forest management and protection, came into effect only 5 years later, fact that facilitated illegal logging. Law 1/2000

[1] FP6 CLAVIER Project (*Climate Change and Variability: Impact on Central and Eastern Europe*) (www.clavier-eu.org).

stipulated the right of holding up to 10 hectares, while Law 247/2005 sanctioned ownership over the entire property. These successive changes led to many forested zones being cleared, even in spaces closed to, or inside protected areas (e.g. Apuseni Natural Park, Călimani National Park, etc.), a situation encouraged also by people's uncertainties connected with the restitution process, and the dissatisfaction of some owners who recovered only part of their property, or what they did recover was in poor condition; other causes were people's low living standard, their need for money and timber, or simply lack of interest of urban residents whose forest properties lay at a great distance from town.

Water is still an abundantly available resource, because no more than 12% is currently being used in the Romanian Carpathians (*Carpathian Environment Outlook, 2007*). Besides global change, also human settlements are expected to put greater pressure on hydrological systems in the near future. In many rural areas and in cities, installing and updating running water and sewage systems has been made possible by pre-accession EU funds (PHARE, SAPARD), and recently by European structural funds.

An important problem of rural and urban settlements, as well as of protected areas in the Romanian Carpathians is **waste management**. The considerable increasing volume of non-recyclable materials implies a new approach to this issue. The capacity of dumping sites being transgressed, the local administrations are implementing a new waste management strategy (ecological dumping sites, waste sorting, etc.).

The Romanian Carpathians' **social-economic background** does affect the natural environment, but at the same time is affected by its changes. The Carpathians are considered to stand at *the periphery of major development axes* preserving *biological resources over the centuries but remaining relatively under-developed compared to the rest of the countries* (*Carpathian Environment Outlook*, 2007). The social-political and economic evolution of Romania during the 1990s was marked by transition from a centralized communist system to a democratic one. Economic growth in the transition period was at its lowest in the early and the late 1990s (*Carpathian Environment Outlook*, 2007). Simultaneously, the economy experienced structural changes to the effect of the share of agriculture and industry / total GDP decreasing; however, referred to the whole Carpathian Chain, they rank at the head of the table. A remarkable development registered the services sector. The same source considers that agriculture and forestry are the dominant forms of land use in the Carpathian Mountains. The important variability of the agricultural production index, organic farming and extensive grazing are among the characteristic features of mountain agriculture in this country. Industry and mainly its mining sector, as well as the small one-industry towns were declining, with negative effects on both environment and social life (unemployment).

The transport infrastructure is still insufficiently developed (few motorways), a problem that should be addressed by the Trans-European Transport (TEN-T) networks

Traditional economic activities (wood-work stone-work, brandy distillation, farming and traditional means of transport (horse-driven carts) could become ecotourism attractions. Moreover, in terms of farming, there is remarkable persistence of transhumance shepherding in the Jina Region (Urushibara-Yoshino, 2006).

The Romanian Carpathians' **population** registers a numerical decrease and low density rates, a situation that has a negative impact on the further practice of cultural and economic traditions in the area. Despite the high level of ruralisation, Internet and mobile phone systems are largely available.

5. Ecotourism in the Romanian Carpathians protected areas

5.1. Protected areas

The Romanian Carpathian Chain holds 22 major protected areas that total approximately 1 million hectares, among which 8 natural parks, 12 national parks and 2 geoparks (Fig. 1) (*Romania. Space, Society, Environment, 2006*).

Besides, the Romanian mountainous regions also have some 600 reserves and natural monuments totaling 50,000 hectares. The first national park in the Romanian Carpathians was established in 1935, but most parks were founded only in 1990 (Table 1), even though the corresponding scientific documents had been elaborated by the Commission of Natural Monuments of the Romanian Academy long before that date. Retezat National Park and Pietrosul Rodnei Reserves were declared Biosphere Reserves and included on the UNESCO World Heritage List in 1980. Other natural and national parks were set up in 2004, the year when the great majority of parks developed a management system and started defining a management strategy with ecotourism as a main target. Two national parks (Retezat and Piatra Craiului) and a natural park (Vânători Neamț) developed such a system in 1999, some others did it in 2005. However, there is a significant difference in terms of the founding year of parks and the implementation of a management system.

The general objectives of national and natural parks are in principal the conservation of landscape and of biodiversity, the area´s traditions, promotion and management of ecotourism. The Romanian Carpathians have a special potential for developing ecotourism given the attractivity, unicity and diversity of their natural environment (landforms, often karstic, primeval forests - 400,000 ha, and numerous protected plant species - *Dianthus callizonus*, *Leontopodium alpinum,* etc.; the widest alpine and sub-alpine meadows on the continent and a lot of animal species - 30% of the big carnivores in Europe among which 4,000 bears, 3,000 wolves and 1,500 lynx) and traditional life styles of local communities. The Carpathians and the Danube Delta were included in the "Global 200" WWF List among the world's major ecoregions, sanctuaries of habitat and biodiversity conservation.

Table 1 National and natural parks in the Romanian Carpathians.
(Source: National Forest Administration, Protected Areas Unit)

	National Parks	Area (ha)	Founding year	Founding year of Park Management	IUCN Category	Specificity
1.	Călimani	24,041	1990	2004	V	Landscape / Geology / Biological diversity
2.	Bicaz Gorge - Hăşmaş	6,575	1990	2004	V	Geology / Landscape / Flora and fauna
3.	Nera Gorge - Beuşniţa	36,758	1990	2004	V	Flora and fauna / Relief
4.	Cozia	17,100	1990	2004	V	Biodiversity / Relief / Traditions
5.	Domogled - Cerna Valley	61,211	1990	2004	V	Flora and fauna / Relief
6	Piatra Craiului	14,773	1990	1999	V	Geology / Karst / Flora and fauna / traditions
7.	Retezat	38,138	1935/1990	1999	V	Flora and fauna / Relief
8.	Rodna Mountains	46,399	1990	2004	V	Landscape / Relief / Traditions
9.	Semenic - Caraş Gorge	36,160	1990	2004	V	Flora and fauna / Relief
10.	Buila - Vânturariţa	4,186	2004	2005	V	Geology / Flora and fauna
11.	Ceahlău	8,396	1990	2004	V	Landscape / Relief (Karst)
12.	Jiu Defile	11,127	1990	2004	V	Flora and fauna / Relief
	Natural Parks					
13.	Upper Mureş Defile	9,156	2007	-	V	Landscape / Mureş Defile
14.	Apuseni	75,784	1990	2004	II	Landscape / Caves / Traditions
15.	Bucegi	32,663	1990	2004	II	Flora and fauna / Relief
16.	Grădiştea Muncelului – Cioclovina	38,184	2000	2004	II	Landscape / Dacian Fortresses/ Caves / Traditions
17.	Iron Gate	115,655	1990	2004	II	Flora and fauna / Relief / The Danube Gorge
18.	Vânători Neamţ	30,818	1990	1999	II	Landscape / Traditions / Monasteries / The bison
19.	Maramureş Mountains	148,850	2004	2005	II	Anthropic resources / Landscape
20.	Putna - Vrancea	38,204	2004	2005	II	Biodiversity / Traditions
21.	Dinosaurs Geopark Haţeg Land	102,392	2004	2005	II	Geology / Landscape / Traditions
22.	Mehedinţi Plateau Geopark	106,000	2004	2005	II	Geology / Landscape / Traditions

In order to improve nature protection and sustainable development in the Carpathian Mountains, the Carpathian Network of Protected Areas (CNPA) has been founded with a view to implementing the Carpathian Convention.

Ecotourism cultural sites occur inside, or in the immediate neighborhood of protected areas, e.g. the local communities in the south of the Piatra Craiului National Park which have also developed interesting ecotourism programmes, and those inside Apuseni Natural Park, known for their old nature-related traditions, as well as the communities of other mountaineous places.

5.2. Ecotourism in the Romanian Carpathians protected areas

Tourism resources and ecotourism

The main forms of tourism in the Carpathian protected areas are rural tourism and agrotourism, mountain tourism, cultural tourism, scientific tourism, speleological tourism and adventure tourism (Fig. 6).

The development of *rural tourism and agrotourism* has been sustained by the presence and harmonious combination of traditions, ancestral festivals and handicrafts in the villages of Bran, Rucăr, Tulnici, Haţeg, Gârda de Sus, Eşelniţa and Albac. The villages situated in protected areas organize traditional events that are a real attraction for visitors.

Cultural tourism is practiced individually or in the form of organized trips to historical and architectural monuments (Tabula Traiana, the ruins of the Tri Kule Fortress and of the St. Ladislau Fortress), archaeological sites (Arutela Roman Camp, Dacian Fortress), religious structures (the monasteries of Turnu and Stânişoara, the ruins of Vodiţa Monastery) located in protected areas, or in places where a traditional life style is still preserved by the local rural communities.

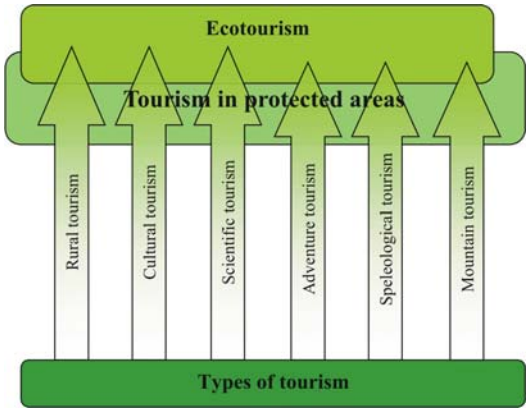


Fig. 6 Types of tourism in Romania's protected areas.

There are several tourism nuclei that attract lots of visitors because they combine the parks' natural sites with the cultural assets of surrounding localities. Such a nucleus is Bran-Rucăr, well-known for agrotourism linked to ethnographic traditions, visits to Bran Castle, wildlife watching, mountaineering and recreational tourism. Another notable nucleus is Bucovina with its famous monasteries, listed as UNESCO's Mankind Heritage, situated in the proximity of Călimani National Park. Among its tourism assets are ecological education programmes, horse-riding and scientific tourism.

Apuseni National Park, visited annually by 300,000 tourists, has on offer agrotourism and speleological tourism. Informations on numerous caves are periodically updated (tracks and endowments) and open to tourists. Retezat National Park (set up in 1935), certified in the Pan Parks network, is associated with Dinosaurus Geopark - Haţeg Land. It is divided in four areas, each discharging distinct activities (scientific tourism, agrotourism, leisure tourism and mountaineering).

There are numerous situations when tourism targets also other types of protected area (Iezerele Cindrelului Reserve, "Nature 2000" Frumoasa site), dotted with agrotourism villages which practice traditional transhumant sheepherding and offer specific foods.

Tourism infrastructure

The most important tourism infrastructure elements are the accommodation units which meet the tourists' vital needs for rest and leisure. Their accommodation capacity influences the volume of tourists, the efficiency of tourism being sustained by number of tourists rather than by one-day visitors. The amount and type of accommodation in protected areas varies considerably, from boarding-houses, camping-sites and bungalows to villas, hotels, motels, hostels and rooms for rent in private homes (Table 2). In most cases, accommodation in the proximity of protected areas is widely available. The total number of accommodation units located inside, or near these areas and certified by the Tourism Department of the Ministry for Small and Medium Enterprises, Trade, Tourism and Liberal Professions, in January 2007 was of nearly 650 units, with approximately 26,700 bed-places (Table 3).

Table 2 Type of accommodation in the Romanian Carpathians protected areas in January 2007.
(Source: *Ministry for Medium and Small Enterprises, Trade, Tourism and Liberal Professions, Tourism Department*)

No.	Accommodation type	No. of units	No. of rooms	No. of bed-places
1.	Hotels, hostels, renting rooms	102	4,493	8,957
2.	Motels	8	98	194
3.	Villas	38	406	796
4.	Boarding-houses	485	8,014	16,218
5.	Chalets	9	117	275
6.	Bungalows	3	20	46
7.	Camping-sites	4	124	350
	Total	**649**	**13,272**	**26,830**

According to *Romsilva* National Forest Administration there are few visiting centres (7) and information points (20) in protected areas, but no accommodation problems in the areas under its administration even for higher numbers of unscheduled visitors, without endangering the environment. In some national parks and nature reserves areas, additional visitor traffic and activities are welcome provided they are managed accordingly. Protected areas offer many opportunities for present tourism activities to expand (UNWTO, 2007).

The owners of accommodation units, the custodians of natural monuments, the national and natural park administrations, handicraftsmen, local, regional and national associations (e.g. Romanian Association for Ecotourism, National Association for Rural, Cultural Tourism and Ecotourism) are really interested in the development of ecotourism, but they are not very numerous and their experience in offering ecotourism products falls short of attracting tourists to this country. Ecotourism attractions which should be promoted are birdwatching, wildlife watching, thematic programmes, caving, riding, outdoor activities (cross-country skiing or snowshoeing, driving) etc.

In the present context, the Ministry of Tourism plans to elaborate a tourism strategy for protected areas, part of it being destined to ecotourism. A similar initiative was advanced in 2005. At present, the main package of ecotourism programmes is promotion of *Discover Romania*, a product developed by The Romanian Association for Ecotourism, the most active profile organization in this country. As stated in their promotion materials, the most important Romanian ecotourism operators of the moment are: The equestrian Center DASKA, Equus Silvania, The Tioc Nature especially in the Retezat; Absolute Carpathian; Apuseni Experience; Discover Romania, an itinerary that spans the distance between the Carpathian Mountains (the Piatra Craiului and the Bucegi) and the Danube Delta, Roving Romania, Inter Pares, The Center for Mountain Ecology, Danut Marin, Carpatour, etc. In 2006 an Ecotourism Certification System issued by the

Romanian Association for Ecotourism suggested several tourism concepts (*tourism destination*, *accommodation*, *tour*, etc.) and established certain products and services.

Table 3 Accommodation offer in the Romanian Carpathians protected areas in January 2007.
(Source: *Ministry for Medium and Small Enterprises, Trade, Tourism and Liberal Professions, Tourism Department*)

Protected Areas	**No. of units**	**No. of rooms**	**No. of bed-places**
Călimani National Park	1	10	20
Bicaz Gorge - Hăşmaş National Park	5	125	238
Nera Gorge - Beuşniţa National Park	6	38	70
Cozia National Park	30	1,422	2,808
Domogled – Cerna Valley National Park	21	1,113	2,170
Piatra Craiului National Park	192	1,245	2,504
Retezat National Park	10	37	78
Rodna Mountains National Park	19	532	1,114
Semenic – Caraş Gorge National Park	9	161	338
Buila-Vânturariţa National Park	3	12	24
Ceahlău National Park	18	145	295
Jiu Defile National Park	1	10	20
Upper Mureş Defile Natural Park	1	10	20
Apuseni Natural Park	74	373	834
Bucegi Natural Park	200	2,243	4,556
Grădiştea Muncelului – Cioclovina Natural Park	2	9	18
Iron Gate Natural Park	10	85	158
Vânători - Neamţ Natural Park	10	289	581
Maramureş Mountains Natural Park	6	35	70
Putna – Vrancea Natural Park	17	81	218
Dinosaurs Geopark Haţeg Land	12	33	72
Mehedinţi Plateau Geopark	2	107	214

3. Ecotourism strategies of protected areas in Romania

Since both national and natural parks have recently been founded and their management is even of a more recent date, many protected areas in Romania are still struggling with major tourism planning problems e.g. zoning tourist areas based on protection and conservation, state of tourism tracks and of the path-mark system, information points and promotion materials, Salvamont Units and management of wastes. Tourism strategies, in general and ecotourism strategies, in particular, are also in an early stage. Each of these strategies focuses on park tourism resources, on forms of tourism that could be practiced based on these resources and on the general objectives. The estimated number of tourists in national and natural parks is around 1,82 million. In terms of general objectives, most tourism strategies for protected areas mention ever higher occupancy rates and tourism-related profits for accommodation units, greater tourism-based revenues for the local communities, improved tourism infrastructure and better services. An important point of tourism development objectives are the education programmes for tourists and the local communities aimed at environmental protection and conservation of protected areas. Other objectives have in view either the preservation of the parks' natural and cultural environment and the assessment of their ecological carrying capacity, or diversification of tourism attractions, simultaneously with delineating tourism zones, monitoring tourist flows, attracting a higher number of extra-season visitors, providing authorized guides, information centres and sign-mark tracks.

Tourism strategies are part of the national and natural parks' own development plans to control human intervention, while exploiting potential visitor attractions and focusing mainly on such general objectives as biodiversity protection and tourism (not always ecotourism). Most of these strategies describe tourist attractions in great detail and often end up in a SWOT analysis.

Natural and cultural tourism resources in the park, as well as tourist tracks are perceived as strong points of each of the analysed national and natural parks. The wealth of their natural heritage (a rich flora and fauna with species and eco-species unique in Europe, wild areas untainted by human intervention) and the continuous development of a national network of protected areas could be a real tourist attraction. Park accessibility is also an important aspect, representing both a strong and a weak point, depending on each Carpathian protected area. Generally speaking, Romania's ecotourism access infrastructure is quite satisfactory. Some of the weak points emphasized by many tourism strategies are a poor offer of recreational activities and services provided by tourism operators and the low training level of profile guides and of the staff of accommodation units (hence the poor quality of services). Similarly, the deficient management of wastes, improper camping-sites, fire-making, car-washing and parking inside protected areas. These

aspects common both to national and natural parks, are expected to be improved by a rigorous zoning of tourist areas and a more efficient management. Access to protected areas is still free, although a set of compulsory regulations regarding permitted and forbidden activities therein are included in the management plans. Poor marketing (lack of funds and trained human resources) is a frequently mentioned deficiency.

The main dangers signaled by the tourism strategies integrated into the management plans of Carpathian protected areas are over-exploitation of natural resources by improper grazing and over-grazing, illegal forest logging, poaching, uncontrolled tourism (causing irremediable biodiversity destruction, conflicts between tourists and the private owners whose propriety is illegally used for camping, fire-making and tourists' behaviour generally), the expansion of built-up areas and chaotic constructions in the close vicinity of, or even inside protected areas (urbanization of the rural space nearby the parks). Climate change has a direct impact on ecotourism by intensifying extreme phenomena (e.g. floods, landslides), also having a negative bearing on forest ecosystems. Unless specific ecotourism policies, planning and especially task plans are elaborated and implemented, degradation of the natural environment through tourist pressure and concentration in hot spots of protected areas, as well as random tourism are supposed to grow in the future. Another weak point is the incapacity of local administrations and local communities to sustain ecotourism, either for lack of implication (financial, political and administrative), or of incentives and support to promote ecotourism products, despite a fierce competition in the profile international market.

The main opportunities for developing ecotourism in Romania are: the ecotourism boom worldwide; Internet promotion of unknown, unspoiled and price-competitive destinations; the initiative taken by the Ministry of Tourism and the Romanian Association for Ecotourism to put to account the ecological products of different regions; the possibility of national and natural parks to use their own initiatives, activities and partnership relations in the marketing and management of ecotourism.

Future ecotourism development in the Romanian Carpathian Mountains calls for a sustainable National and Natural Park Management Plan, combining environmental conservation with the expansion of tourism by improving visitor facilities (reception and translations centres, sing-mark paths, observation towers for watching wildlife, refuges, etc.), undertaking promotional activities and establishing a close cooperation between the park authorities and the local communities. Such actions are expected to improve tourism-related trading opportunities for the rural communities located inside protected areas, or in their immediate neighbourhood.

Tourism in Romania and ecotourism, in particular has a huge potential, yet insufficiently exploited and poorly promoted. Developing, this type of tourism is the most appropriate form of nature conservation, also brings benefits to the local communities. However, development should be monitored in order to reduce its environmental impact as much as possible.

CONCLUSIONS

Ecotourism, connected primarily with the tourism sites of the Carpathians Mountains' national and natural parks, and with local ethnographic traditions, features "ecotourism nuclei" of a great regional diversity.

Climate change in the Carpathians is already a reality and represents one of the greatest environmental, social and economic challenges to the region. The increased variability of climatic conditions (temperature rise and significant precipitation decrease), especially in the last decades of the 20th century, has a negative impact on mountain forest ecosystems and on components of the natural heritage. As the mountain climate tends to become warmer and drier, the natural vegetation, particularly the high alpine protective cover, is expected to be seriously endangered, because retaining soil moisture capacity, soil erosion or the resilience of vegetation species against pests is closely dependent on warming rates.

These aspects will have a direct impact on ecotourism which, in the near future, is likely to make a major contribution to the sustainable development of the mountain space.

References

Alexandrescu, A., A. Geicu, V. Cuculeanu, A. Marica and N. Pătraşcu (2003) Climate change impact on forestry ecosystems. Vulnerability and adaptation measures. *In: Potential impact of climate change in Romania* (ed. Cuculeanu, V.), Ed. Ars-Docendi: 101-128.

Bălteanu, D., L. Badea, M. Buza, Gh. Niculescu, C. Popescu and M. Dumitraşcu (eds.) (2006) Romania. Space, Society, Environment. Ed. Romanian Academy, Bucharest, 384 p.

Bălteanu, D. (2003) Environmental Change and Sustainable Development in the Romanian Carpathians. *In: The Journal of the Geographical Society of Hosei University*, 35: 7-12.

Bojariu, R. and M. Dinu (2007) Snow variability and change in Romania. *Nationalpark Berchtesgaden, Proc. of the Alpine*Snow*Workshop*, Forschungsbericht, 53: 34-38.

Boroneanț, C., M. Ioniță and Al. Dumitrescu (2004) Estimarea tendinței de variație a temperaturii medii sezoniere în România în contextul schimbărilor în circulația atmosferică la scară mare din sectorul atlantico-european, *Annual scientific session: Meteorology in the context of sustainable development*, National Meteorology Administration, Bucharest (in Romanian).

Busuioc, A. (2008) Climate scenarios for Romania. *International Conference on Adaptation and Mitigation Measures of Climate Change Impact*, Parliament House, February 21, Bucharest.

Busuioc, A., F. Giorgi, X. Bi and Al. Ioniţă (2006a) Comparison of regional climate model and statistical downscalling simulations of different winter precipitation change scenarios over Romania. *Theoretical and Applied Climatology*, 86 (1-2):101-124.

Busuioc, A., F. Giorgi, X. Gao, X. Bi and Al. Dumitrescu, (2006b) Climate change scenarios for mean extreme temperatures in Romania. Comparison between statistical and dynamical downscaling. *Third Workshop on the Theory and Use of Regional Climate Models*, May 31 – June 9, 2006, Trieste, Italy.

Ceballos-Lascurain, H. (1996) Tourism, Ecotourism and Protected Areas, *Gland: International Union for Conservation of Nature and Natural Resources*.

Clarke, J. (1997) A framework of approaches on sustainable tourism, *Journal of Sustainable Tourism*, Volume 5, 3: 224-233.

Dinu, M. (2005) Ecoturism Coduri etice şi norme de conduită. Ed. CD Press, Bucharest (in Romanian).

EEA (2004), Impacts on Europe's changing climate. An indicator-based assessment. Office for Official Publications of the European Communities, Luxembourg.

Fennell, D. (2003) Ecotourism. An Introduction. Second edition, Routledge.

Hurrell, J. W. (1996) Infuence of variations in extratropical wintertime teleconnections on Northern Hemisphere temperature, *Geophys. Res. Lett*., 23: 665-668.

Keller, F., F. Kienast and M. Beniston (2000) Evidence of response of vegetation to environmental change on high-elevation sites in the Swiss Alps. *Regional Environmental Change*, 1: 70-77.

Page, S. and Dowling, R. (2002) *Ecotourism,* Prentice Hall.

Statistics of the National Forest Administration - Romsilva (2008) Protected Areas Unit, Bucharest.

Swarbrooke, J. (1999) Sustainable Tourism Management. CABI Publishing.

Trenberth, K.E., P. D. Jones, P. Ambenje, R. Bojariu, D. Easterling, A. Klein Tank, D. Parker, F. Rahimzadeh, J. A. Renwick, M. Rusticucci, B. Soden and P. Zhai (2007) Observations: Surface and Atmospheric Climate Change, in Climate Change 2007: The Physical Science Basis. *Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change* [Solomon, S., D. Qin, M. Manning, Z. Chen, M. Marquis, K.B. Averyt, M. Tignor and H.L. Miller (eds.)], Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA.

Urushibara-Yoshino, K. (ed.) (2006) Changing social conditions and their impacts on the geoecology - Transhumance Regions of Romania and Slovenia. Department of Geography, Hosei University, Tokyo, Japan.

UNEP (2007) Carpathian Environmental Outlook. Geneva, 232 p.

UNWTO (2007) Romania National Tourism Development Master Plan 2007-2026.

www.ecotourism.org (the International Ecotourism Society)