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# The Carpathian Ecoregion – a New Initiative for Conservation and Sustainable Development: Implication for Romania

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## Introduction

Cross-border cooperation over the region's ecological problems has greatly increased over the past decade and the UE "Natura 2000" programme will eventually produce a coordinated system of protected areas. But there is also a case for biodiversity conservation on a wider scale through "ecoregion-based conservation" linked with the sustainable development of large land units that are biologically coherent in terms of species, communities and environmental conditions. Such an approach is now being taken by the World Wide Fund for Nature's "Carpathian Ecoregion Initiative" (CEI) with the aim of facilitating a process of collaboration enabling NGOs and key stakeholders to collaborate to secure both conservation and sustainable development across the region. Detailed biodiversity and socio-economic assessment has been undertaken to provide the basis for a long term biodiversity "vision" for core areas, complemented by a range of specific local projects aiming at sustainable forms of rural diversification. The paper discusses some approaches that are being adopted in Romania with particular reference to agriculture, forestry and rural tourism.

There has been much evidence of international cooperation over conservation since Langer (1990) demonstrated the many opportunities to safeguard Europe's "ecological bricks" through cross-border cooperation. Poland's "green lungs" in the northeast of the country are being drawn into a wider international conception, while the Morava floodplain is now being conserved through Austrian, Czech and Slovak cooperation and the Stability Pact in the Balkans has attracted Swiss funding for cooperative management in up to five biodiversity-rich transfrontier areas. In this paper the emphasis is placed on the Carpathians, a mountain area which extends over six countries (fig. 1 and table 1).

**Table 1. The Carpathians.**

Country	Area (sq. kms)	Carpathians (sq. kms)	A	B	Protected areas (ha)	
					Category 1	Category 2
Czech Rep.	78,864	6,708	8,5	3,6	204,810	-
Hungary	93,030	7,735	8,3	4,1	244,162	67,201
Poland	312,685	19,716	6,3	10,4	886,575	81,508
Romania	238,391	95,566*	40,1	50,4	423,184	396,761
Slovakia	49,035	38,150	77,8	20,1	848,875	243,219
Ukraine	603,700	21,700	3,6	11,4	239,964	206,860
Total	1375,705	189,575	13,8	100,0	2847,570	995,549

A - Carpathians as a percentage of each national area; B - Percentage of Carpathian territory falling to each state.

- - Some definitions of the Carpathians include the Transylvanian Plateau but this area is excluded from these calculations which cover only the main Carpathian ranges, the Subcarpathians and contact areas where communities make use of mountain grazings.

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Much of the region consists of border districts where coordination has been impeded in the past by closed frontiers. This legacy is now being overcome by closer cooperation between national park organisations, which share common frontiers. There is also a trilateral initiative to protect rare ecosystems with the help of charitable foundations and the Global Environmental Facility (GEF) to focus on the linkages of habitat fragments. NGOs are also getting together under such organisations as Carpathian Bridge (“Priashév”): an international association of public ecological organisations combining the Ukrainian “Carpathian School” (Lviv) with “Pcola” from Slovakia (Stara Lubovna) and the Foundation of Support of Ecological Initiatives from Poland (Krakow).

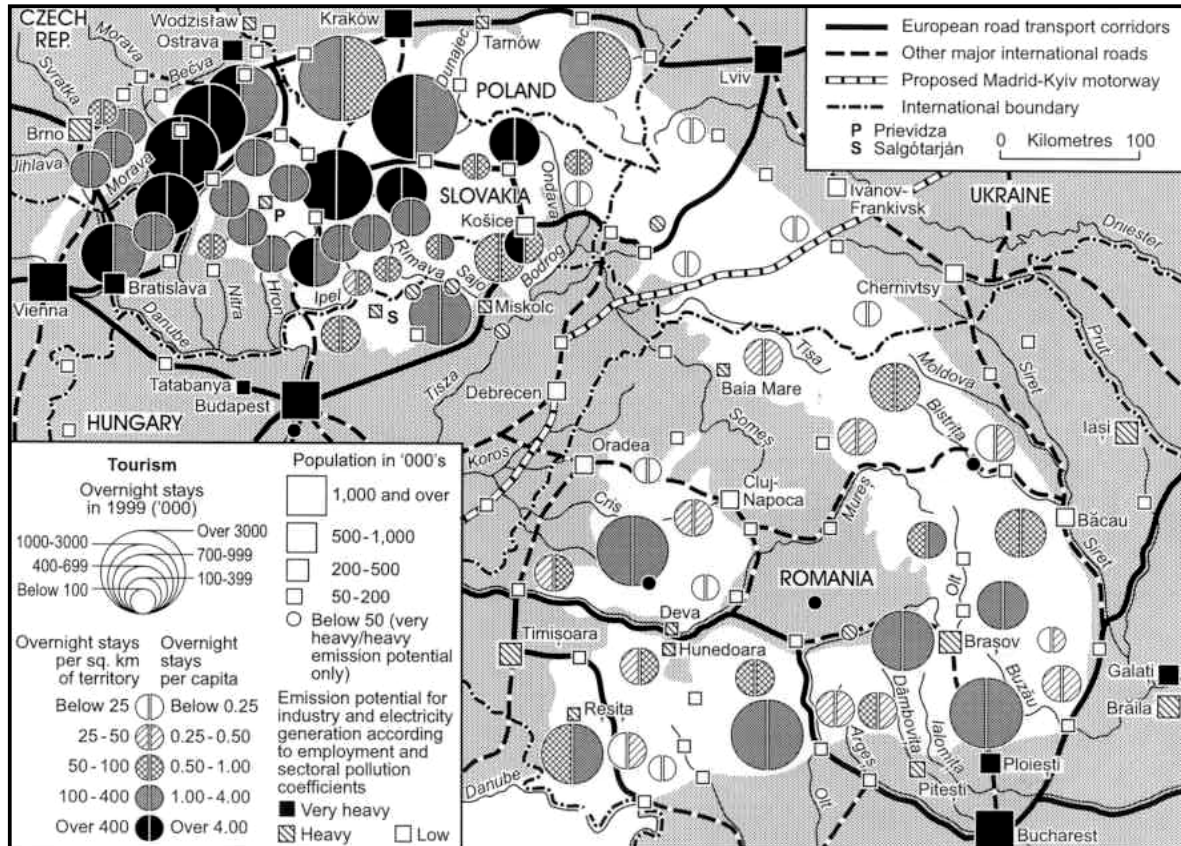


Figure 1. The Carpathians: urban-industrial development, tourism pressure and major transport corridors (Source: Nefedova, 1992)

### Safeguarding the Carpathians

Arguably, the Carpathians need a more coordinated approach in the light of the United Nations Conference on Environment & Development (UNCED) in Rio 1992 and the concept of “fragile environments” reflected in Chapter 13 of Agenda 21: “sustainable mountain development” (Messerli & Ives, 1997; Mountain Institute, 1995). Such an approach could be justified on economic and social grounds in the light of the attempt by the Council of Europe (CoE) to win special status for mountain regions and their fragile communities. But it is also very necessary for ecological reasons given the value of the scenic resources as well as the flora and fauna. Particular importance attaches to large carnivores (bears, wolves and lynxes) which require large territories and use the Carpathian “bridge” to connect habitats in the northern and southern parts of the continent. Over the past decades, attempts to conserve the region’s biodiversity have focused mainly on ensuring that the most valuable sites are formally protected, and about six percent of the region’s total area is now secure, though there is much more in the north than the south, especially in view of the fact that most of Romania’s national parks do not yet have management system in place (Voloscuk, 1999). But there is a wider

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problem in that these protected areas do not safeguard all threatened species and in any case retention of threatened species within small “island” reserves does not eliminate the possibility of extinction. Hence the case for safeguarding biodiversity conservation on a wider scale through “ecoregion-based conservation” (ERBC) linked with the sustainable development of large land units that are biologically coherent in terms of species, communities and environmental conditions. Such strategic projects can realistically cope with immediate threats in the context of the socio-economic conditions and safeguard the future through a clear vision of the conservation goals and the participation’s required by stakeholders, working in partnership at all levels from international agencies to local communities – and with input from all relevant disciplines, for an adaptive programme of coordinated management interventions.

### **Threats to Biodiversity**

The Carpathians are confronted by a mix of threats, summarized in Figure 1 in terms of urban-industrial development with significant levels of pollution (especially on account of coal-burning thermal power stations and chemical and metallurgical industries), tourist pressure (including hunting) and transport flows along the main European corridors. However, there is a contrast between the northwest, characterized by a “virtuous circle”, where civil society and political stability attract investment to reinforce attractiveness, and the southeast with a “vicious circle” arising out of low investment, reduced spending power and greater instability. Development threats are generally stronger in the northwest, while air pollution damage to forests is most evident in the Beskidy of Poland, mass tourism exists in the Tatra, road projects are very likely to be implemented and the demand for electricity may increase the need to proceed with the potentially damaging hydropower plants on rivers like the Dunajec in Poland (Voloscuk, 1998). Meanwhile, development pressures in the south are weaker, yet rural economies are less sustainable than before, given the illegal cutting of restituted forests and heavy grazing pressure by peasant farmers whose main source of income arises from the sale of livestock. Privatized logging companies in Ukraine have been able to use their own contacts to negotiate very favorable leasing arrangements – encouraging wasteful use of timber – whereas open timber auctions would produce more realistic prices and stimulate efficiency.

Much has been done to improve management of the landscape and its resources. Working from the concept of territorial systems of ecological stability developed in the former Czechoslovakia, the 1994 Slovak Act on Nature and Landscape Protection provided for five levels of territorial protection and specific flora and fauna, minerals and fossils: working from the national level, through protected landscape areas with characteristic landscape or historical settlement form; national parks where natural heritage protection carries overriding priority; small protected sites comprising biocorridors or biocentres of local or regional importance; and finally nature reserves and monuments of nature. Other countries are working along roughly similar lines in setting out conservation programmes and forestry codes. Romania is also playing a key role with regard to a “Carpathian Large Carnivore Project” (CLCP), while Ukraine already has a “Programme for Developing a National Ecoregion Network 2000-2015”, which will contribute to a future European Ecological Network, and a multi-functional forestry code. But the zoned areas still do not protect all endangered species, enforcement levels are low and illegal hunting is particularly serious. Public dialogue over conservation is still at a formative stage, but it is evident that good ideas appreciated by local government and conservation groups often lack the financial and legislative support required to carry them through.

### **The World Wide Fund for Nature’s Initiative**

These various initiatives are now being combined into a strategy which can apply across the Carpathians as a whole. Given strong commitment from the six countries, the World Wide Fund for Nature (WWF) has drafted a mission statement to initiate and facilitate a process through which key stakeholders collaborate to secure conservation and sustainable development across the region. Reconnaissance in 1999 took account of all relevant expertise and involved contact with selected stakeholders and key actors in order to assess the

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biodiversity of the Carpathians in the light of current threats and conservation efforts. This work has established that while there are challenges, which require urgent attention, there is also a high level of commitment to achieve worthwhile objectives. During 2000-2001, detailed biodiversity and socio-economic assessment has been undertaken, leading to a long-term biodiversity "vision" and the initiation of specific projects. There will also be work on preparing a 10-15 year ecoregional conservation plan and an action programme for the next five years. A steering group will consist informally of a core team involved in practical decision-making about the project and other participants whose role is of a more "ambassadorial" nature, while regional coordinators and country contacts will form the core of the biodiversity, socio-economic and GIS working groups. While biodiversity lies at the core of the initiative, an socio-economic perspective is needed to identify threats (such as World Bank projects and national development plans) in the context of natural resources decision making and institutional frameworks.

CEI does not stand in isolation and there are substantial opportunities for synergistic actions. The EU dimension is of the greatest relevance, given the "Natura 2000" conception of a European system of protected areas and work inspired by the CoE and the United Nations Environment Programme (UNEP) to establish a Pan-European Ecological Network (Bennett, 1998). The CoE's "Euromontana" organization is associated with the World Conservation Union (IUCH) through a European Mountain Forum a local "Carpathians Mountain Forum" now operates within IUCN Slovakia (Backmeroff et al., 1996). And a large number of NGO's are also available for inclusion in conservation networks. Mention should be made of other WWF actions such as the "Endangered Species Campaign" and various policy and lobbying projects on agriculture, rural and regional development. Highly relevant also is a World Bank/WWF project on the "Implication of Land Restitution Programmes in Eastern Europe and Central Asia" and the WWF initiative ("Human Footprint on the Biodiversity of Europe") which aims to secure EU "Fifth Framework" funding to develop a methodology to value to biodiversity (in the context of conservation goals) alongside economic development in order to define critical thresholds.

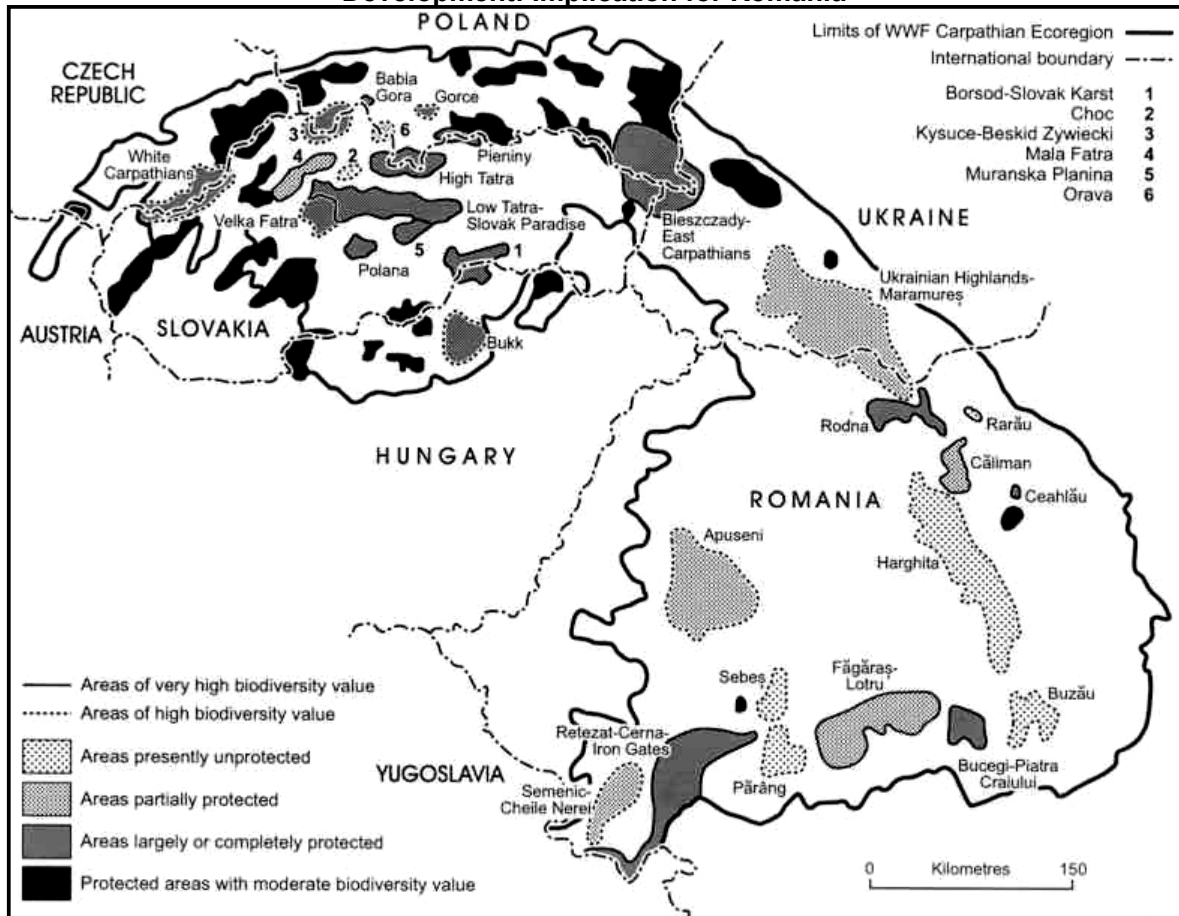
### **The Vision for the Carpathian Ecoregion Initiative**

CEI is innovative: never before has such a large-scale long-term or visionary approach been attempted in the region. As a unique international partnership committed to conserving the key ecosystem in the heart of Europe it has the prospect of funding through a Green Carpathian Fund with contributions from governments (some outside the region, with Carpathian interests) and international donor agencies like World Bank GEF, United Nations Development Programme, the EU Presidency and the European Commission. The summit in Bucharest in April 2001 secured the agreement of the six governments involved (along with others concerned with complementary Danubian initiatives). The work will develop in two directions. There is first of all a need for agreed conservation programmes in a range of priority areas with high biodiversity resources and without excessive socio-economic pressures. Research has built up from Focal Species Group Areas – identified for habitats (48), plants (27), large carnivores and other mammals (15), amphibians and reptiles (10), and birds (6) – to arrive at a set of priority Biodiversity Important Areas (BDIAs) (figure 2). In the process particular weighting was given to habitats because of their importance in finding centres of Carpathian endemism and also because of the good data coverage. These core areas are in many cases already protected in some way but where this is not the case then there will be particular urgency in providing safeguards.

### **Sustainable Development**

At the same time, it is not possible to protect the entire mountain system. There is a substantial rural population dependent on the natural resources and maintaining these fragile communities must be a complementary part of the vision. Any approach to conservation should recognise the universal demand for growth and higher living standards in all the countries involved (Peryanowski, 1999).

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**Figure 2. The Carpathians vision: priority conservation and their current status (Source: World Wide Fund for Nature).**

Hence the relevance of local projects for sustainable development in which NGOs (including those already networked through the Environmental Partnership for Central Europe: EPCE) will work with stakeholder groups within individual communities. A strong push is coming from the EU which takes the view that future pre-accession funding should reflect the status of agri-environmental schemes as a key policy instrument throughout the union (Gyulai, 1998); following the 1996 Cork Declaration-seeking integrated programmes of sustainable rural development for each region – and the LEADER approach of targeted/tailored programmes for specific problems and areas (most recently spelt out under Article 33 of Regulation 1257/1999) (Baldock et al., 2001).

The new EU rural funding programme for accession countries (SAPARD) should be contingent on grass-roots participation and on connections with protected areas networks and Natura 2000 (Avis 2000). It is also recognised that forest management has a role to play, while rural tourism has been much discussed as a sustainable business through the need to conserve local scenic and cultural resources in line with the development of the business on a community as well as an individual household basis (Kurek, 1996, Godde et al., 2000).

Writing on the Stuzhitsa area of the future Ushanski National Park, Slee (1999) sees rural cultural tourism as highly appropriate in an area of small-scale biological farming, following the decline of communist industry. Mention should also be made of the EPCE's ecological networks which have realised a system of cross-border "Amber Trails".

The European Commission Environment Directorate (2001) has considered how tourism could combine with protected areas.

Tourism will bring economic benefits and enhance support for Natura 2000; while appreciation of the specific qualities of the area will increase interest in its conservation.

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### **Sustainable Development in the Romanian Carpathians Agriculture and Farm Diversification**

EU pressure to implement agri-environmental projects that will attract SAPARD funding has raised the issue of capacity building which is being addressed by the Avalon Foundation (The Netherlands), working with Veen Ecology in the same country and the Institute for European Environmental Policy (UK). Supported by the Dutch Ministry of Agriculture, Nature Management & Fisheries and Dutch Ministry of Foreign Affairs these organisation are working with partners in the accession countries to develop pilot projects. Romania has been involved since 1998 and Carpathian pilots at Dornelor – Tihuța (Suceava) and Tismana – Peștișani – Runcu (Gorj) are being looked after by the NGO “Tineretul Ecologist Român” (TEN) consisting of representatives from government ministries, research institutes and environmental organisations. The emphasis is on rural development through environmental resource protection: conservation management of species-rich hay meadows; marketing and processing including quality control of milk production and use of local trademarks e.g. for cheese; adding value in the local timber industry; providing training courses for farmers; and safeguarding the cultural heritage. In the process there is collection of environmental baseline data, design of management agreements, as well as training for officials and work on monitoring/control measures to build administrative capacity.

However, much Romanian agriculture is already environmentally sustainable for the most part and heavy pressure on resources usually arises through poverty (Bădescu et al., 2000). Thus it is essential that progress is made to generate more non-agricultural employment that will reduce the need for intensive subsistence farming (Muică et al., 2000). A good example is provided by the Apuseni Mountains when rural poverty has increased as a result of closures in the mining industry and in textiles at Abrud and Câmpeni. At a time when the authorities are trying to establish a national park in the region, there is tension over access to grazing land between forest managers and the local communities of Beliș, Budureasa, Buntești, Gârda, Pietroasa and Rieni which have interests in the Padiș Plateau. Overgrazing and illegal cutting of wood is widespread, yet the concept of sustainability is poorly understood and under present circumstances people believe that an exploitative attitude to the environment is legitimate despite the resulting degradation. There is a need for environmental education and a “durable” conception of conservation linked with rural diversification. At the moment, farmers follow traditional practices and are generally reluctant to sell land, apart from small fragments that are of little agricultural value. Their defensive attitude is strengthened by disinformation wrongly suggesting contemplation of excessive conservation controls on grazing, woodworking and forest fruit collection.

The Romanian government has taken some steps to help the region through the formulation of “Plan de amenajare a teritoriului zonal Munții Apuseni” during 1993-1995; with financial backing approved in 1996 (Moise 2000). This strategy has been endorsed by the EU through PHARE and result has been a number of investments in 1996-1997, including six in milk production and processing and two for wood processing plus an initiative by Alba County Council in the field of rural tourism. Local organisations are starting to get involved in development issues (Chauvin, 1997). An association was formed at Întregalde in 1997 to mechanise mowing with proceeds used to develop milk processing. And a small slaughter house established by these people in Baia de Arieș is generating profits which are being invested in meat processing (Ianoș, 1999). This work is complemented by the work of NGOs, notably “Albamont” which has established production groups in connection with milk collection and woodworking, but also beekeeping and trout farming. At the same time, “Campania Apusenii curății” is seeking to regulate some of the problems arising from the exploitation of small farm woodlands acquired through restitution in 1991. For the dumping of sawdust on riverbanks and at roadsides in areas of high tourism potential is a considerable nuisance which reflects not only a lack of awareness on the part of the local population, but the absence of a centralised storage facility and means of utilising this waste material.

However, the progress needs to be accelerated with greater emphasis on the infrastructure. It is proving difficult to market milk, given the lack of local catering or processing firms, which is why much of the production is fed to pigs. Although electricity distribution has now reached most villages, piped water is very restricted while piped gas is non-existent. Lack

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of surface roads (apart from the main highways) makes many villages inaccessible to vehicles for much of the year and although Albamont has been setting up community groups to campaign for better roads progress is slow in an area where settlement is highly dispersed. There is a case for more assistance on the grounds that the Apuseni is a “less-favoured area”. An Agency for the Mountainous Areas “Agenția Națională pentru Dezvoltarea Zonei Montane” operated during 1990-1996 and prepared a “Mountain Law” (1994) but it has never been debated in parliament (Tont, 2001). This measure would restore to the local inhabitants rights predating World War Two that were annulled under communism. These measures would provide for an annual timber allocation (with tax exemption on the wood products sold and reduced transport charges for marketing). There would also be subsidised prices for newly-weds buying timber for house-building. An alternative strategy would increase the locally-based research, through a branch of the Institute of Mountain Research (Cristian, Sibiu) to maintain through model farms and provide both education in rural management and technical support for diversification. This is particularly necessary in the Apuseni where the reduced employment in mining is forcing the rural population to find alternative income by cutting the forests while national park management remains ineffective (Pop, 1997).

### **Forestry**

Romanian forests are an extremely valuable resource since there are relatively few plantations involving artificially-planted monocultures of fast-growing species (though there were some tendencies towards species change in the early years of communism which gave rise to instability): the tradition is essentially one of promoting native species and natural forest composition based as far as possible on natural regeneration. Moreover, Romanian forests have been generally well-managed over the years and it would not be too difficult to refine current practices so as to achieve certification in line with the standards set by the Forest Stewardship Council. This in turn would ensure better management to maintain biodiversity and secure higher prices for the timber harvested. Certification is also relevant since the main demand for Romanian timber is shifting from Arabian and Chinese markets to Western Europe which is demanding FSC certified timber. This approach is being followed in the Peșani Mountains near Brașov where the woodlands administered by the districts of Codlea, Maieruș and Șercaia will comprise model “Forest Management Unit” (FMU) for certification purposes, with practice gradually extended to other areas. Documentation will be needed to trace the “chain of custody” as material moves from the forest through the processing chain with each stage duly certified. In this way the wood products can be traced back through the manufacturing process back to the relevant FMU.

Certification requires a social impact assessment which must provide for formalised consultation with local communities/stakeholders to define tenure and land use rights e. g. regarding the collection of mushrooms and fruit or grazing the meadows. There is also a need for an environmental impact assessment to ensure that timber harvesting maintains the ecological functions and integrity of the forest. At present there is not enough identification of rare/endangered species even though nearly half the Peșani FMC is protection forest (albeit in the interest of soil and water rather than fauna/flora conservation). Harvesting techniques need improvement to protect soil and water resources. Because of the low forest road density skid trails are inappropriately sited (often along streams) and watercourses are generally crossed without culverts or temporary bridges (Fortech, 1999). Finally, the certification process will have to take account of restitution. The limited restitution of 1991 (350 000 ha nationwide) led to illegal felling on a disastrous scale in some areas, but the 2000 legislation will involve about half the total forest area. However, owners of up to 10 ha will have to follow a “summary management plan” while larger areas require “detailed management plans” drawn up by management planning companies or other authorised organisations in consultation with a range of forest owners (Beckmann & Abrudan, 2001).

Also in the Brașov area is the Piatra Craiului Natural Park where it will be very necessary to eliminate illegal acts in the interest of conservation. While the authority of the park management must be asserted, the involvement of communities in forest management is now considered a realistic option to avoid fragmentation and retain the forest as a complex and

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valuable natural resource system while allowing decentralisation so that local interests to benefit in terms of income for poverty-alleviating consumption and also for investment and development. Local communities frequently require forest products, particularly fuel and pasture and so the community – in collaboration with the forestry administration – needs to identify suitable areas (under state or private ownership) where it might be appropriate to reduce constraints on commercial logging that legislation might normally impose. Communities could also be involved in the creation of a few strategically-located industrial poles revolving around wood products, or service and recreation poles around tourism and crafts, which could enhance the overall competitiveness and provide the manufacturing and marketing base for making protected area management economically viable. The government may need to offer financial incentives for community association and then ongoing consultations will be needed between communities and the forest administration, with the latter sensitive to local traditions and needs. At the same time, local personnel need adequate training to assume their responsibilities effectively and justify a transfer of ownership and authority. There will need to be consultation within communities to involve all stakeholders with vested interests to generate management plans that will be environmentally and economically acceptable.

A good example of the way in which community management could make a difference concerns the conflict in the Piatra Craiului Mountains between sheep and large carnivores (bear and wolves). After about 60 days of grazing (out of a season that may last from 90-140 days) the high meadows are exhausted and sheep are forced into the forests to find food. As they disperse they become less well protected and fall an easy prey to large carnivores. At the same time half the Norway spruce seedlings involved in the natural regeneration process are being damaged. The situation can only get worse if peasants continue to expand their flocks and it will be increasingly difficult to secure local approval for large carnivore conservation. However, community management might secure agreement to moderate sheep numbers in order to reduce forest damage and secure alternative income from tourism related to study of the wild animals. Such a scenario would be all the more likely if income gained from hunting remained in the locality. Income from conservation would also increase support for development control in the Bârsa Valley above Zărnești where the local authority has to consider pressure for a rash of second-home development as well as the case for conserving the meadows for a Large Carnivore Centre and other forms of sustainable tourism (Promberger, 1999). A local “Asociație de Ecoturism Plaiuri Zărneștene” (AEPZ) is now in existence but it needs more “capacity” and momentum to make conservation an important local issue.

### Tourism

Development of sustainable rural tourism has occurred in several parts of the Carpathians and Maramureș provides one of the best examples (Muică & Turnock, 2001; Turnock, 1999). While a modest tourist industry was sustained under communism at the mountain resort of Borșa, the rural component has been encouraged since 1989 by aid from Western Europe, through “Operation Villages Roumains” and since 1994 by a national association (“Asociația Națională pentru Turism Rural Ecologic și Cultural” – ANTREC). Additional help has come from the Maramureș County Council, through business advice and the improvement of village infrastructure by natural gas distribution, and the local Chamber of Commerce & Industry through its promotional activities. There has also been some stimulation from fiscal incentives in the Borșa and Vișeu area which are designated “Less-Favoured Areas” as a result of mine closures. There is now a significant network of over 80 “agrotouristical farms” (ATFs) with accommodation for nearly 600 people, plus additional capacity not included in the national catalogue. Most ATFs are accessible by telephone and offer foreign language skills. Generally all offer a bath, shower, kitchen, heating, TV and washing machine, along with private open space and children’s activities.

Apart from the ANTREC and OVR, there are some local associations supporting the growth of tourism. Botiza appreciates the importance of “adding value” through the provision of handicrafts and guiding services and facilities for cart/bike rides and fishing. In this way the business extends from the individual farms but can stimulate positive attitudes among the wider community, as is demonstrated in areas which have succeeded in reaching a larger scale of



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development (Muică et. All., 1999). But the most ambitious local group appears to be “Fundatia pro Vișeu”, promoting a small town that is the traditional centre for district (“cnez”) covering the Vaser and Vișeu valleys. The group, which enjoys support from abroad arising from German connections, developed in 1998 from an informal association involving enterprises, individuals and the local authority and now has internet access: <http://www.viseu.mmnet.ro>. Vișeu is presented as a future tourist centre of international importance with a target of 120 family homes providing accommodation (Sabău, 2000). Tourism here can make much use of Vaser Valley forest railway or “mocănița”; as well as mineral water in Valea Vinului and various cultural monuments reflecting an ethnically diverse community of Germans, Gypsies, Hungarians and Ukrainians as well as Romanians.

Thus the rural tourism initiative in “old” Maramureș is now well-established on a modest scale with local control of a business which clearly projects a living culture; thereby meeting one of the key criteria for sustainability. The resources of Maramureș constitute a genuinely evolving culture, for traditions inherited from the pre-communist period are reasserted in a new way which is nevertheless far removed from the large commercial scale of operations characteristic of Western Europe. Regimes of pluriactivity project a vibrant culture which requires museums only for a supporting role to supply historical perspectives. The region is not well-adapted for mass tourism: rather it is one of the best places in Europe to escape the stress of the modern world and discover a culture that works to a leisurely pace set in an environment that is rich in terms of both scenery and biodiversity. Although there are no statistics available for “old” Maramureș, international arrivals appear to be edging upwards. Yet recession in the domestic sector, due to the painful transition, means that total tourist arrivals in Maramureș county continue to decline. Foreign tour operators are highly enthusiastic of the offerings for small parties. The Maramureș village is considered one of Europe’s “best-kept secrets” where visitors are well-received, although not all the farms are offering good service and there is an inevitable delay in providing indoor toilets and en suite facilities as a general rule.

Local tourist organisations should get more involved with the regional planning agency for North West Romania which recognises both the cultural resources and the need to relieve poverty in the area (ANDR, 2000 p. 30).

Promotional efforts should also be placed more fully on a cross-border basis through closer cooperation with Ukraine via the Sighet-Slatina bridge currently under construction. However, environmental management. Mining at Borșa in the communist period has resulted in some desecration of the landscape (Mac I., 1993) the area also had its share of trouble in 2000 when heavy rain and melting snow caused a dam burst in the upper Vișeu vally near Băile Borșa which released heavy metal sludge into the river. Elsewhere, illegal cutting of timber is reported, small sawmills are causing pollution through inappropriate dumping of sawdust and visitors to the Rodna Mountains are causing litter problems, reflecting both a lack of environmental awareness and inadequate waste management. Fortunately, the local ecological society is involved in the conservation of the upper Tisa meadows (where the river marks the frontier between Romania and Ukraine), an internationally valuable bird habitat for which Ramsar status is being sought. Moreover, the Maramureș Mountains are to become an international biosphere reserve with finance from the UE and NATO where priority will be given to forecasting natural calamities and protecting nature through six monitoring stations. With the additional support of the WWF through CEI, there is a real prospect that the biodiversity resources will be safeguarded, provided Romanian environmental legislation is more clearly spelt out to provide for more effective and consistent enforcement.

## **Conclusion**

The CEI is a challenging project but the priority areas have been carefully selected and have found agreement among scientists, while financial resources for the medium term are largely assured. However there is a need for a greatly improved supply of information to educate stakeholders and the public in general over the unique resources of the Carpathians and to research potential threats like woodland restitution. Much will depend on the supporting role played by NGOs and there will inevitably be different rates of progress when the experience of well-established organisations is compared with smaller and younger groups with limited

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contacts and resources. However this will mean that good practice can be passed down the line to encourage more initiative where the building of instructions is relatively slow. This will apply to the quest for sustainable development across the region. In Romania, where many of the more serious ecological problems have eased since the revolution by a combination of factory modernisation and reduced output, the challenge is to secure a higher standard of biodiversity conservation that will at the same time help to relieve poverty because coping strategies that threaten the environment cannot be renounced unless other sources of income are provided. The paper discusses a range of initiatives which now depend on further promotion and investment.

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