

11 Environment

11.1 Situation and problems

The Carpathian Mountains region represents a unique a dynamic common living space (natural, cultural, political and socio-economic), both ecologically valuable and important in terms of its human heritage. The region has enormous ecological and economic potential and currently faces rapid environmental, social and political changes. The challenge is to preserve and fulfil the region's potential and specificity while increasing its sustainability. This will require adequate, responsible actions, taking into account global, regional and trans-boundary contexts and linkages, in order to enhance both the Carpathian environment and human livelihoods.

The current development pattern in the Carpathian region is leading to the loss of traditional knowledge, livelihood, practices and values. Since the fall of communism and over the last 18 years of transition, changes in urban and the natural environment and its forms and structures were significant. For example, rural depopulation menaces the traditional character of the Carpathian countryside. It is therefore extremely important that culturally sustainable and coherent policies be formulated and implemented in the Carpathians, in order to slow down or perhaps even reverse this trend. Policy measures must be implemented and incentives developed, so that people remain in their villages as guardians of the landscape, traditional knowledge and way of life. Education, communication and public participation, together with environmental awareness, could form the basis for creating a sustainable environment in the Carpathian region.

The Carpathian Mountains are the largest in area, longest, most twisted and fragmented mountain range in Europe (although having lower average altitude than the Alps). Stretching over 8 countries, and dominated by middle and low mountains, they are severely affected by human activity. Land use changes, deforestation, and extreme climatic events against the background of global environmental change are increasing the vulnerability of these mountains to various, both natural and anthropogenic phenomena. They exhibit great fragility, with some of the major threats including deforestation, over-exploitation of niche resources (wood and certain mineral ores), land use changes (land abandonment) and related land degradation and elimination of traditional livelihoods.

The Carpathian Mountains include many unique landscapes, and natural and cultural sites, which express both geographical diversity and a distinctive pattern of regional evolution of man-environment relation over time. The Carpathians were put on the WWF "Global 2000" list among the major ecoregions of the world for the conservation of habitats and biodiversity.

From the bio-geographical point of view the Carpathian Mountains represent a link between the taiga of Northern Europe and the Mediterranean ecosystems to the

south, and also are the home of the largest pristine forests on the continent. The rich variety of endemic plants and animals, characteristic of the Carpathian ecosystems is an integral part of the European biodiversity. The Carpathians as a whole are considered to be a biodiversity-rich region with an estimated minimum of 60.000 wild species. Also, the largest population of large carnivores in Europe are found in the Carpathians.

Efforts to maintain the diverse landscape and native flora and fauna resulted in a well-developed network of protected areas (national and natural parks) that currently cover up to 13% of the Carpathian Mountains. The Implementation of the Nature 2000 Network in the five EU member states should ultimately lead to the protection of at least 15% of the Carpathian total land area.

11.2 Policy recommendations for environmental protection

11.2.1 The preservation of primeval virgin forests

Much of the Carpathian range is covered by vast areas of forests. On average, forest cover is nearly 60%, but the percentage varies considerably according to countries and areas. The largest forest complexes are in the Eastern Carpathians. In the Western and Southern Carpathians substantial areas were deforested and converted to other use of land. Deforestation and fragmentation increases from the region's main ridge to the peripheries.

The Carpathians area is famous for its relatively large share of natural and semi-natural forests occurring either on areas of high elevations or in areas of rugged topography with limited access. It is expected that these ecosystems provide shelter to a rich variety of rare species, now extinct elsewhere due to intense forms of forest management. Characteristic feature of natural Carpathian forests is the large volume of dead wood. Natural forest floors maintain over 100 cubic meters of dead wood per hectare, while in managed forests dead wood amounts to nearly 10 cubic meters per hectare. The lack of dead wood implies a substantial lack of biodiversity (e.g. plants fungi and invertebrates that depend on this particular substrate for their survival). Dead wood has many environmental values, the most important being carbon sequestration, particularly at higher altitudes. Recently the EU proposed a new agro-environmental scheme of financial support during the period from 2007 to 2013 that would provide opportunities for increasing the area of old wood refuges.

Nearly all the remnants of natural and semi-natural forests in the Western Carpathian are now protected in natural reserves or national parks in the Czech Republic, Poland, Hungary and Slovakia, including their valuable, rare and threatened forest ecosystems. Much larger areas of primeval and natural forests exist in Ro-

mania and in Ukraine. Not all of these areas are protected by law, but now even in these areas selective cutting systems are employed and efforts are made to limit forest exploitation. Forest regeneration is mostly natural, while the planting of tree seedlings is widely used as a way to convert secondary Norway spruce stands (plantations) into more diverse forest stands.

In general, annual timber cutting in the Carpathians is lower than the gross annual increase of the volume of wood. Nevertheless, deforestation processes are occurring in the region and can be observed in Romania and Ukraine. These processes – beyond excessive timber cutting – can be resulted from increases in soil pollution and acidification, or from establishing new ski trails where the opening of forest margins altered the microclimate and gave rise to bark-beetle outbreaks. Illegal clear-cutting, poaching and the over-exploitation of other forest products such as mushrooms, berries and rare plants and animals are alarming phenomena that are on the upswing.

The structure of forest ownership in the Carpathians has changed rapidly over the last two decades. In the 1990s the majority of forests were state-owned: nearly 100% in Ukraine, over 90% in Romania, more than 80% in Hungary and Poland. The subsequent re-privatisation and restitution of forests to private owners has changed this situation. Nowadays privately owned forests constitute 43% in Hungary, 41% in Slovakia, 40% in the Czech Republic, 20% in Poland, 8% in Romania and there are no private forests in Ukraine. Private ownership often results in a disintegration of forest management and fragmentation of stands. Forest privatisation also tends to place more value on economic benefits, rather than on ecological and social values.

Timber production remains a major source of income in the Carpathian region. However, in some areas, small sawmills and other wood processing industries have a more social than economic character (e.g. preventing local unemployment). A growing source of income from forests is tourism and recreation. Forest tourism trails, hunting areas and guest rooms in mountain villages are all successful economic activities, competing with single wood processing in the Carpathians.

11.2.2 Waste and hazardous materials disposal

Why should waste disposal be one of the most important measures in the Carpathian region? Between 1990 and 1997 waste production decreased substantially in this area. Nevertheless, this decrease was mostly due to dramatically declining industrial and agricultural production. Since 1998, the volume of waste is again increasing dynamically, especially the waste produced by households. In many places waste dumping is on the rise, sometimes dramatically, as old refuse dumps are full and there is a lack of acceptance of new sites being placed in local commu-

nities. Furthermore, in mountainous areas there are less suitable places for refuse dumping than in the plains and underground water streams can transport dangerous materials more rapidly and further than on the plains. Key issues related to waste management in the Carpathian countries are the predominance of land filling, as a waste management option, and the problem of low recycling rates.

The greatest problem appears to be municipal waste, where the waste generation is worse than 17 years ago. The existence of obsolete hazardous chemicals remains a major issue. One emerging problem concerns new hazardous chemicals, and the recent "hazardous waste market". A special category of problems is presented by brown-fields and the numerous sites which had been ruined by a variety of waste related problems.

Moreover, major new construction projects (e.g. large dams, highways, factories, harmful mining technologies, mountain winter sport resorts) have led to severe negative impacts on nature and landscapes, as well as producing additional wastes.

The import and mass-utilisation of non-recyclable materials have increased problems associated with waste management, especially at local level, including a significant rise in the total amount of municipal waste. Finally, legislative, conceptual, organisational and technical ignorance of the scope of problems such as communal waste has caused the proliferation of thousands of small local waste sites, both informal and illegal.

Municipal Waste

During the communist period municipal waste management received little attention and funding. In the majority of Carpathian countries, neither relevant legislation nor institutions did exist. There were many ten thousands of illegal deposits located in forests and along the country roads. After 1990, the municipal waste situation worsened, partly because of the collapse of the existing system of paper and glass collection, partly because of the increasing use of the non reusable packages and the lack of municipal waste recycling. With more processed food products and with the spread of hypermarkets and other large chain stores, increased human consumption has resulted in greater waste production.

Hazardous Waste

Hazardous wastes and their management are a substantial programme in the majority of the Carpathian countries. The share of processing industries is only 27–29% as this figure indicates. This may suggest that a very large number of new small industrial firms together are producing a fairly large part of industrial waste, but they do not report any waste in order to avoid fees and fines.

In Hungary, a programme to build a network of regional hazardous waste landfills and incinerator plants was elaborated in the mid-1980s, but has not been fully completed due to limited financial resources.

An important emerging problem is the illegal or “semi-legal” import of hazardous waste and toxic chemicals from one Carpathian county to other. E.g. hazardous and non-hazardous wastes were transported from Germany to Hungary, simultaneously, hazardous materials were transported from Hungary to Ukraine, to Lviv and Zakarpathia regions.

It is clear that the annual volume of solid waste generated in the Carpathian countries and regions will continue to grow during the next decade, due to the increasing affluence of residents, as well as changing life styles and consumption patterns. Waste management practices need to improve as well. It is probable that a higher share of municipal waste will be recycled, and that the environmental standards both for landfill disposals and incinerators will improve.

The majority of landfills in the Carpathian EU member states do not comply with the standards, elaborated in the EU Landfill Directive. The non-complying landfills will have to be either closed down and the sites rehabilitated, or updated to comply with EU standards. Considerable investment is thus needed in this area.

On the other hand, waste legislation at the EU level is evolving, particularly with the recent revision of the Waste Framework Directive in June 2007, addressing in particular the challenge of establishing a system of efficient and environment-friendly incineration of waste, characterised energy recovery and cross-border trade of waste between EU member states. The Directive also introduces a five-step hierarchical “order of priority” for dealing with wastes as follows:

- 1) prevention of wastes
- 2) re-use of products
- 3) recycling/composting
- 4) recovering of energy by incineration and
- 5) landfill disposal.

This hierarchy is to be applied “flexibly” by member states whose first priorities in the Carpathian region must still be considered as the needs to reduce landfill disposals and increase the recycled share of waste.