Chapter Two

Socio-Economic Driving Forces







he Carpathian countries have undergone significant political, economic, social and environmental transformations during the past 15 years. Their industry, agriculture and transport sectors were originally developed at accelerated rates, increasing pressures on the environment. In the late 1970s and during the 1980s, some economic contraction occurred, when the rate of economic growth declined and external debt reached extremely high levels. In the early 1990s, GDP, industrial production and agricultural output fell significantly; diminishing economic output led to a significant reduction of air and water pollution. In most countries, the recent economic recovery did not lead to major increases in such pollution again. This decoupling process is the result of economic and technological modernisation and stricter enforcement of new environmental regulations. The economy today is based on farming (closely associated with animal husbandry), forestry and mining, which remain predominant land uses.

Over decades under the centrally-planned system, there was a very strong and rapid conversion of farmland for the expansion of human settlements, industrial and mining activities, and infrastructural development. During the last 10-15 years, agricultural production, including plant production and animal husbandry, has decreased in the Carpathians and huge areas have reverted to fallow land. In the beginning of the 1990s, a sharp decline of agricultural production was accompanied by a decrease in the use of pesticides and fertilisers. With the increase of production since 1994, fertiliser consumption resumed, but the use of pesticides remains very low.

Forestry is a major economic sector in the Carpathian countries. Under communist regimes forests were over-exploited, with the total harvest exceeding the annual increment. Forests are getting younger and thinner, while extensive clear-cutting has resulted in accelerated runoff during heavy rainfall. Currently, there is a general trend toward stabilisation of forest extent in the Carpathians. The process of industrial decline in many areas of the Carpathians has had beneficial effects through recovery from former pollution levels. However, forests will remain vulnerable, as poverty leads to extensive illegal logging for heating purposes (firewood).

The Carpathian countries are highly dependent on imported oil and natural gas, mainly coming from Russia. Over the past decade the Carpathian countries have restructured and downsized their coal industries by closing down inefficient (deep) mines and reducing the coal mining labour force. The geostrategic importance of the Carpathian region lies in the oil and natural gas pipelines traversing most of the countries on their way to Western Europe. In general, power production in the Carpathian region relies mainly on fossil fuels, followed by nuclear, hydro and renewable energy sources.

The ageing of the population and growing inequality between rural and urban areas are major concerns in the Carpathian region. In addition, increasing poverty and high unemployment rates are the greatest social problems in most areas. This situation occurs for many reasons, and efforts to enhance the quality of rural life must include improvements of agricultural production, employment, infrastructure and housing. One of the main current threats is the process of abandonment of agricultural lands and traditional farming practices, a phenomenon reflecting a post-war trend of rural depopulation and marginalisation of wide agricultural regions, especially affecting mountain areas.



2.1 Macro-Economic and Structural Policy Overview

Economic Growth: 1970s until 1990s

B etween the 1970s and early 1980s, the industry, agriculture and transport sectors in most Carpathian countries had relatively high economic and investment growth rates. During the 1980s, when an economic contraction occurred, overall growth declined and external debt reached extremely high levels.

At the end of the 1980s, after the collapse of the Soviet Union, the Carpathian countries lost their traditional economic and external trade ties and began the transition from planned to market economies.

In all Carpathian countries, the changes were followed by some ten years of economic decline, rising inflation rates (especially in Romania and Ukraine), increasing poverty and decreasing life expectancy. In the early 1990s, GDPs, industrial production and agricultural output fell significantly. All countries also faced population decline and population loss through migration.

The countries experienced significant differences in GDP growth rates. The highest was reached by Poland followed by the other three Visegrád countries (Czech Republic, Hungary and Slovakia). Romania witnessed two economic depressions in the early and late 1990s. Post-communist Ukraine observed nearly a decade of steep economic decline. In 2005, Ukraine was the only Carpathian country which did not reach its 1990 level of economic output. Generally, in the late 1990s, some countries reached the same levels of economic output they had experienced in the late 1980s. Others still face recovery and stabilization (see Figures 2.1 and 2.2).



Figure 2.1 GDP growth rate at prices and PPPs of 2000, 1990–2005

Post-EU Membership

Since joining the EU, the Czech Republic, Hungary, Poland, Slovakia and Romania have had strong economic growth, improved labour markets and, in most cases, low inflation.

Export performance has improved in most of the new EU economies, exceeding expectations. Following an early exceptionally rapid pace of economic expansion, the pace of regional growth slowed but still remains significantly higher compared to that of the EU-15. At the same time, industrial output growth has been decelerating.

The five new Carpathian members continue to outperform the EU-15 by a wide margin, proving themselves to be functioning market economies. They competed so successfully for foreign direct investment (FDI) and jobs, on the basis of significant labour cost and corporate tax advantages, that enlargement has caused some friction with some of the original EU-15, the majority of which have imposed temporary restrictions on labour mobility. The evidence therefore clearly shows the new members' abilities to cope with the full pressure of competition within the single EU market of 457 million residents (383 million of which are in the EU-15). It should also help them to reach considerably higher average real per capita income levels.

In the short term in the EU-10¹, economic indicators point to steady growth as a whole, with the possible exception of Hungary among Carpathian countries. In the short and medium term, the noticeable rise of FDI inflows and the accelerating pace of economic integration in the post-accession period should support solid supply-driven GDP growth and the improving export performance of the foreign-controlled business sector.

¹ On 1 May 2004, 10 new countries have joined the European Union: Cyprus, Czech Republik, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Slovakia and Slovenia.





Recent Regional and Country Figures

One can find at least two very visible axes of development in terms of GDP per capita across the Carpathian region. From higher to lower, the first goes from northwest to southeast, and the second from west to east. The most developed areas are located in the Czech Carpathians and Bratislavsky Kraj, with over $\notin 6\ 000\ per\ capita$, as well as in Northern Hungary with 5 000 to $\notin 6\ 000\ per\ capita$. In most of the Romanian Carpathian counties, this figure is below $\notin 2\ 500\ per\ capita$ (see Map 2.1).

Poland is the largest economy among the seven Carpathian states, accounting for nearly half of regional output. Economic growth in Poland increased sharply until 2004 and has remained at a comparatively high level, with expectations for strong output growth in the short term. However, due in part to the dampening impact of ongoing fiscal tightening, the growth rate may remain well below five per cent (UNECE 2005).

In the Czech Republic and Hungary, which account for 20 per cent and 16 per cent of Central European economic activity respectively, patterns of growth were similar. In both economies, dynamic export growth was based on FDIinduced improvements in productivity and quality, solid investment expenditures and decreasing consumption due to moderate wages and gradual fiscal consolidation.

Slovakia, accounting for nine per cent of regional output, grew strongly in 2004, mainly driven by domestic demand. GDP growth continues at a brisk pace, driven by private consumption based on rising real wages and employment, as well as robust fixed capital investment. Furthermore, imports have risen faster than exports.



Map 2.1 GDP per capita in the Carpathians, 2002

Employment

Unemployment generally remains high and persistent, with most countries unable to achieve a significant reduction in their high rates of unemployment – a reflection of the structural nature of the problem in most of the new EU-10 countries. Relative to the target of the Lisbon agenda ('EU jobs and growth policy' adopted during an EU Summit in 2000), employment rates remain comparatively low as they do for other EU countries. At the same time, employment in the new EU member states (except in Hungary) has generally been rising faster than in the rest of the EU, although there was a marked deceleration in several countries. An upturn in employment growth in Poland helped lift the regional average. Sustained economic growth has helped to lower unemployment, although the correlation between the rates of output growth and unemployment remains weak.





Changes in employment, while significantly different across countries, generally reflect the cyclical position and momentum of each economy, differences in the sectoral composition of economic growth and the varying ability of markets to cope with the adjustments imposed by economic transformation (see Figure 2.4 and Map 2.2).

In 2005, Poland and Slovakia had the highest unemployment rates (17.7 per cent and 16.4 per cent respectively). Czech, Hungarian and Romanian unemployment rates were between 7 per cent and 8 per cent. Ukraine shows the lowest rate (3.6 per cent in 2003).

With the exception of Hungary, Romania and Ukraine, female unemployment exceeds that of

Figure 2.3 Poorest quintile's share in national income or consumption





Figure 2.4 Unemployment rate in the Carpathian countries, 1990–2005

males. In most countries, unemployment is more severe for both sexes among young people. In recent years, the unemployment rate under the age of 25 has reached worrying levels in Hungary, Poland, Romania and Slovakia. For example, in 2005 in Poland, nearly 36 per cent of all youths did not have jobs. In Hungary and Romania, the jobless rate for youths is three times higher than the national average unemployment level.

Structural Changes

Over the past decade, the national economies of the Carpathian countries have been significantly restructured. For example, the expansion of the service sector, except for the last two years, exceeded the growth rate of all the other sectors and currently accounts for over 60 per cent of the GDP in most countries. Hungary has the most robust service sector followed by Poland, Slovakia and the Czech Republic. The GDP share of the service sector in Romania, Serbia (together with Montenegro until 2006) and Ukraine, while still high, lags behind at around 50 per cent (see Table 2.1).

Agriculture still plays an important economic role in Romania, Serbia and Ukraine. For the

Visegrád countries, the GDP share from agriculture was under four per cent in 2003.

Looking only at the Carpathian areas of the countries, economic activity in the last centuries was determined by the natural environment, folk customs, tribal relations and the economic policies of the governments that had control of the region. As in the past, the economy and land-use today are based on farming (closely associated with animal husbandry) and forests. Compared to that of neighbouring lowlands, the economy of the Carpathians is far less developed. However, the situation varies considerably from country to country and region to region.

					F	Percentage of GDP
		1995			2003	
	agriculture	Industry	services	agriculture	industry	services
Czech Republic	4.7	41.9	53.4	3.4	38.4	58.2
Hungary	6.8	30.9	62.3	3.7	30.7	65.5
Poland	6.7	37.8	55.5	3.8	31.4	64.8
Romania	20.9	40.3	38.8	12.9	37.8	49.3
Serbia and Montenegro	19.3	37.8	42.9	21.1	32.1	46.8
Slovakia	6.0	38.2	55.8	3.9	32.0	64.0
Ukraine	15.0	41.3	43.7	12.0	35.3	52.7

Table 2.1 Structu	Iral changes	in the Car	pathian co	untries, 1995	-2003

Source: UNECE, OECD

Foreign Direct Investment (FDI)

Foreign Direct Investment (FDI) in the Carpathian countries has increased. However, these inflows (as a percentage of GDP) remain significantly below the levels from several years earlier when the majority of privatisations were undertaken. For many of these countries, a significant portion of their current FDI is not new equity investment but rather reinvested earnings. The EU remains the largest source of FDI in the region, with Russia and the U.S. providing additional investments. A turning point is that some new EU Carpathian states have reached the level of per capita income which permits domestic enterprises to undertake significant FDI abroad. However, other than Hungary, such outflows are not yet sizeable. In Hungary, only 15 firms account for 80 per cent of total FDI outflow. The outward FDI of Hungary and Slovakia is also concentrated in the region. Research suggests that investment abroad may be beneficial for economic development by improving integration into the world economy – as a result, government assistance in promoting outward investment may be desirable.

Decoupling Impacts on the Environment

Between the 1970s and 1980s, healthy economies in the Carpathian countries also meant significant environmental pressures. However, the pre-1989 period did not show adequate concern for the environment or the potentially negative consequences of human activities.

In the early 1990s, significant reductions in GDP and industrial and agricultural output contributed

to reducing overall environmental pressures, especially air and water pollution and agricultural chemical use, and improving the state of the environment.

In most Carpathian countries, the latest economic recovery did not lead to a similar growth in environmental pressures. This 'decoupling' process resulted mainly through economic and

The Informal Economy

The existence of a business sector outside the official economic system is a phenomenon that is present in all types of economies. At the same time, the notion of informal (also referred to as unofficial, hidden, shadow and unobserved) economic activity is very broad. The broadest concept is that of the "non-observed economy", which refers to all productive activities that are not captured in the source data used for the compilation of national accounts.

The non-observed economy is assumed to comprise three main components: "underground production" (activities that are legal by their nature but are concealed for tax evasion purposes); "informal activities" (legal production activities characterized by a low level of organization, typically based on unofficial relationships); and "illegal activities" (those banned by law or illegal when performed by unauthorized persons). Here, the term "informal economy" is used as the equivalent to the "nonobserved economy".

There is abundant evidence that both the size and types of informal economic activities increased significantly in economies undergoing the process of transition from planned to market. While the most widely acknowledged reason for the emergence of the informal economy is tax evasion as well as deficiencies in the tax system, the causes of its growth in the transition economies are more complex, and some of them relate to the specificities of the transition process.

The deep and prolonged transformational recession during the early years of transition was accompanied by massive job losses. Real household incomes collapsed as a result of declining real wages and shrinking employment. Given the inability of the economy to generate a sufficient number of jobs in the formal sector, and in the absence of adequate social safety nets, switching to informal economic activity was a survival strategy for many individuals. The inadequate institutional environment and the inability of governments to provide adequate services also contributed to the growth of the informal sector. Overall, despite some decline in recent years, the informal sector still makes an important contribution to total production and employment in the Carpathian countries.

The estimates suggest considerable inter-country differences in the size of the informal sector – Ukraine, Serbia and Montenegro and Romania have much larger informal sectors than do the Czech Republic, Hungary, Poland and Slovakia. The latter group of countries are among the most advanced in implementing systemic and market reforms and, on average, their real per capita incomes are considerably higher, partly reflecting the fact that they have achieved much higher rates of economic growth during the past 15 years. Nevertheless, all the former centrally planned economies still have larger informal sectors than do the developed market economies (as reflected in the OECD average).

This suggests that the informal sector of the economy in the former centrally planned economies is likely to diminish as reforms progress and real per capita incomes increase. Indeed, well-functioning product, labour and capital markets are likely to support more job creation in the formal sector of the economy. The strengthening of the institutional environment and the provision of good public services, together with reforms that reduce the corporate tax burden, should improve the incentives for businesses to pay taxes. In turn, these changes should also support sustained economic growth, which is the key factor for both net job creation and a rise in real per capita incomes.

Although income from informal activities can help to cushion some segments of the population from the strains of transition and cope with poverty in the shortterm, reliance on such activities cannot be regarded as a sustainable longer-term solution. Besides, the informal economy has significant costs in terms of foregone tax revenues, which increases the risks of triggering a vicious circle of even higher tax rates. It also breeds unfair competition that distorts product and labour markets, which, in turn, undermines the benefits of structural reform for private sector development.

(Source: UNECE 2005)

technological modernisation and stricter enforcement of new environmental regulations (see Figure 2.5). The most spectacular examples relate to reductions of traditional air pollutants such as sulphur dioxide and nitrogen oxides – clearly showing the recent effects of major switches from coal to natural gas as a key energy source.

At the same time, there is a clear difference between the northwest and southeast sections of the Carpathians, manifested in different state and foreign direct investments, unemployment rates, poverty levels and ethnic tensions. In the northwest, developmental threats to the environment, for example from hunting and tourism, are greater. At the same time, forests are expanding in part due to reduced farming pressures, and mass tourism is a concern only in some areas.

In the southeast, development pressures are much weaker. But poorer regions with high unemployment generate other threats to the environment, for example the illegal cutting of newly restituted forest lands. Recent legislation (2000) in Romania could eventually increase the concentration of private property into fewer hands, and raise overall poverty. This in turn could



Figure 2.5 Decoupling of GDP from air emissions

result in high tree-cutting levels similar to the experiences encountered during Romania's first privatisation round in the early 1990s.

The existence of an informal economy (see box above) probably has many negative environmental consequences such as the disposal and international transport of illegal waste, transboundary movement of second-hand products (e.g. refrigerators, old cars), illegal logging for export to western European countries, illegal trade of endangered flora and fauna, and a general avoidance of environmental regulation and rules.

Conclusions

The Carpathians are now confronted by a mix of challenges which require coordinated management. The continued decoupling of environmental pressures from economic growth requires an integrated approach to the management of consumption and production patterns including a more efficient use of resources. This could include a shift toward a knowledge- and servicebased economy which may decrease demand for natural resources and promote waste minimisation. Policies aimed at directly integrating the environmental impacts of consumption and production patterns into the entire product life cycle are also needed.



Agriculture

Pre-transition

ver many decades under the centrallyplanned system, there was generally a very strong and rapid conversion of farmland for the expansion of human settlements, industrial and mining activities and infrastructural development. Many river valleys were developed such as the Bistrița in Romania, Vah in Slovakia and Sajó in Hungary.

At the same time, the lower-altitude sections of the Carpathian sub-basins were subject to centralised, intensive agricultural methods which significantly altered the traditional agrarian structure of the region. In the 1960s, these methods were used to drain wetlands, destroy forests, increase soil erosion and dramatically alter the Carpathian landscape. In general, the original mosaic of small farm fields, grasslands, wetlands and shrubby terraces was transformed into vast farm fields covering hundreds of hectares, and led to substantial reductions in biodiversity. Poland was an exception where the preservation of small-scale private farming was the result of a strong subsistence mixed-farming mentality.

Most of the rest of the Carpathians, remote from leading markets, were marginal to development plans, which thereby helped to preserve biodiversity. Furthermore, socialist collectives used a particular "specialisation" approach, whereby specific areas were used for specific purposes. This control-based, as opposed to market-based, approach tended to reduce arable farming (defined here as farming crops, cereals and vegetables) in mountain regions, excluding Slovakia where the development of arable farming in mountain regions was supported. Overall, total arable land area remained stable between the 1950s and 1990s.

The transition period

Agriculture and forestry are now the dominant forms of land-use in the Carpathian Mountains.



Figure 2.6 Agricultural production index in Carpathian countries, 1990–2003

However, significant variations can be seen across countries and regions (see Figure 2.6). For example, compared to other countries, the Slovak part of the Carpathians has twice the proportion of arable land but less forest cover. And in Romania, there is a high proportion of grasslands which is a result of extensive grazing in mountain areas.

Large differences can also be seen among agricultural labour forces in the Carpathian countries. For example, the number of small holders in Slovakia is very low with agricultural production concentrated in large cooperatives and enterprises, while Poland is dominated by small farming parcels.

Since 1990, agricultural production experienced an overall reduction in intensity in terms of both crops and livestock. This was due in part to reduced domestic consumption following economic decline combined with the withdrawal of subsidies for fertilisers and other inputs. In many parts of the Carpathians, many farmlands were abandoned and large areas became fallow.

In the Carpathian countries, the structure of the agricultural sector is now rapidly being reformed. This includes changes in land ownership and major shifts in traditional landuse, even in marginal agricultural areas.

Valuable semi-natural agricultural lands are being intensified or abandoned. Throughout the region, unwise agricultural practices include not adequately taking into account climatic and soil conditions for crop cultivation and livestock farming. Modern agricultural equipment is either not readily available or appropriate in mountainous areas such as those in the Maramures region of Romania. Bad practices have also significantly aggravated the incidence of landslides and mudflows, exacerbating deforestation's contribution to erosion over the last few decades.

In general, agricultural lands do not have an optimal structure, with cereals occupying a much too important position, considering the soil and climatic conditions in the Carpathians (UNEP 2004a). Lower parts of the Carpathian sub-basins are used mainly for cereals production such as wheat, maize and barley. In the middle altitudes, potatoes are a typical crop dominant in Romania, Slovakia and Poland.

In the Ukrainian Carpathians, agriculture has limited importance owing to unsuitable natural conditions, producing only small amounts of grain, meat and milk for domestic needs. In both Romania and Ukraine, de-industrialisation and unemployment have forced many to farm on

a subsistence basis, working only to feed themselves without receiving wages.

Carpathian Livestock

Traditional agriculture based on seasonal pasturing in mountain meadows remains well preserved in the Carpathians. However, cattle and sheep stocks have decreased significantly during the past decade (UNEP 2004a). In some traditional grazing areas, densities are falling below the level required to maintain species-rich grasslands and traditional orchards ('semi-managed areas' represent areas where humans have tradi-

Table 2.2 Livestock change in Car	pathian countries, 1995–200	4
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										1000 heads
	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Cattle										
Czech Republic	1988.8	1865.9	1700.8	1657.3	1573.5	1582	1520.1	1462	1428	:
Hungary	928	909	871	873	857	805	783	770	739	723
Poland	7193	6958.1	7028.8	6455.2	6092.6	5723	5498.8	5421	5276.8	5200.2
Slovakia	929	892	803	705	665	646	625	608	593	540
Romania	3051.1	2870.4	2799.8	2877.8	2897.1	2811.7	:	2870.8	:	:
Ukraine	19624.3	17557.3	15313.2	12758.5	11721.6	10626.5	9423.7	9421.1	9108.4	7712.1
Pigs										
Czech Republic	4016.2	4079.6	4012.9	4000.7	3688	3593.7	3440.9	3429	3308	:
Hungary	5032	5289	4931	5479	5335	4834	4822	5082	4913	4059
Poland	20342.7	17696.7	18496.7	19275.4	18223.9	16991.5	17494	18997	18439.2	17395.6
Slovakia	2076	1985	1810	1593	1562	1488	1517	1554	1443	1149
Romania	5848.4	4797.4	4446.8	5058.1	5145.4	6588.8	:	8259.7	:	:
Ukraine	13945.5	13144.4	11235.6	9478.7	10083.4	10072.9	7652.3	8369.5	9203.7	7321.5
Sheep										
Czech Republic	134	120.9	93.6	86	84.1	90.2	96.3	103	104	:
Hungary	977	872	858	909	934	1129	1136	1103	1296	1397
Poland	608,1	506,2	467,5	422,4	372	336,8	331,1	332,2	331,3	310,8
Slovakia	428	419	417	326	340	348	316	316	326	321
Romania	8121	7656,8	7251,2	7312,4	7446,9	7466,4	:	7238,4	:	:
Ukraine										
Equids										
Czech Republic	19,2	19,1	20,7	22,7	23,8	25,8	20,9	21	20	:
Hungary	71	70	:	:	:	75	60	63	62	67
Poland	635.8	568.8	557.9	560.9	551.5	549.7	545.7	329.6	333.1	321
Slovakia	10	10	10	10	9	10	8	8	8	8
Romania	858.1	864.5	860.3	8/9.4	896.8	833.1	:	992.1	:	:
Ukraine										
Poultry										
Czech Ropublic	27875 /	27572.7	20025 5	30222.2	30794 4	32045.4	20046.0	23425	2/227	
Hungary	35450	32/25	27030.0	35005	30704.4	32043.4	27740.0 A2270	23433	17760	/1330
Poland	51730 6	56315 3	54737 5	54250 1	5/552.0	53261 1	55502	534/6 /	146321 1	130280
Slovakia	12282	1/11/7	14000	12117	122/17	13580	15500	12050	1/1217	130209
Romania	69143	70075.6	71413 3	77378.0	76616 3	89454 7		82407.0		
Likraine	164900	149700	129400	123300	129500	126100		136800	. 147400	. 142400
Unidific	101700	147700	127400	120000	127300	120100	123700	100000	11/100	172700

Source: Eurostat



Map 2.3 Livestock units in the Carpathians, early 2000s

tionally influenced the landscape, giving rise to species adapted to those new landscapes) (see Table 2.2).

In Romania, even though grazing remains common, threats exist from the further marginalisation of poor quality lands to scrub if incentives are not introduced to maintain sheep stocks.

In the early 2000s, the density of livestock units (LSU) in the Carpathians was the highest in the regions of Chernivets'ka, Ukraine and Malopolskie, Poland (over 180 LSU per sq km). The lowest were in Észak-Magyarország (Northern Hungary) and Vest Romania (West Romania) (under 60 LSU per sq km) (see Map 2.3).

Fertilisers and pesticides

Fertiliser consumption in the Carpathian countries increased sharply during the 20 years up to 1980. From 1980 to 1990, the consumption of the three key nutrients used in fertilisers – nitrogen, phosphorus and potassium – stabilized as optimal levels were reached.

In the beginning of the 1990s, a sharp decline of agricultural production was accompanied by a decrease in the use of pesticides and fertilisers. From 1989 to 1993, total nutrient consumption drastically fell from over eight million to about three million tonnes. Since then, fertiliser consumption in the region has fluctuated between 3.2 and 3.6 million tonnes of nutrients per year (IFA 2006).

With the increase of agricultural production since 1994, fertiliser consumption resumed but pesticide use remained very low (see Figures 2.7

and 2.8). Today, many farmers cannot afford fertilisers or pesticides because prices for agricultural production (or "inputs") have generally



Figure 2.8 Consumption of pesticides, 1980-2002



risen while those for farmers' produce (or "outputs") have declined – known more popularly as the "agrarian gap" or "scissors effect".

In the early 2000s, Poland accounted for about 45 per cent of the region's total fertiliser consumption, Romania 12 per cent, Hungary 12 per cent and the Czech Republic 10 per cent.

Solutions

The size and diversity of the agriculture sector continue to be substantially influenced by changing consumer demands and rural patterns, technological advances and globalisation of the economy. These trends have positive and negative effects on the sector's performance with regard to environmental quality and nature conservation. For example, support for conventional production through increased fertiliser and pesticide use is forcing the introduction of GMO technologies into agriculture.

Threats to biodiversity continue, especially from intensive agriculture. Other threats to biodiversity include the continued perception of large predators as being incompatible with cattle breeding and herding by many local people. In addition, more valuable meadows could continue to revert to shrubland if livestock grazing levels are not properly managed.

Agricultural landuse in the Carpathian Mountains can contribute to maintaining the area's biodiversity, as long as agricultural management is small-scale, diverse and respects the carrying capacity and suitability of local conditions. A positive sign is that the foothill arable lands, valley haylands and meadows and higher mountain meadows are generally managed sustainably by local communities.

Organic farming activities in the Carpathian countries date back to the mid-1980s although a marked expansion only started in the mid-1990s, with an exceptional growth rate in the Czech Republic. By 2004, the share of biologically cultivated area in the Czech Republic accounted for 7.3 per cent of total agricultural area, followed by Hungary with three per cent. In the region, Poland and Romania had the lowest rates with 0.57 and 0.48 per cent, respectively (Organic Centre Wales 2006). Today in the Carpathian countries, organic farming is still limited to a few per cent of the total agricultural area (see Figure 2.9). However, the low-intensity prac-



tices of many private and co-operative farms are compatible with particular forms of integrated and ecological farming.

The European Union (EU) is a major factor, both positive and negative, for sustainable agriculture and rural development in the Carpathian Mountains. A number of EU laws and policies that are being prepared and implemented by the new EU member states are potentially powerful tools. These include the Special Assistance Program for Agriculture and Rural Development (SAPARD), Leader, Natura 2000 in agricultural areas and the mountainous less-favoured areas (LFA) approach.

The future challenge is to ensure that such opportunities are used to their full extent, to minimize potential negative impacts and maximize potential benefits (UNEP-ISCC 2006). For example, SAPARD pre-accession funding will make a difference when agri-environment measures have become a key policy instrument requiring capacity-building and training for farmers in the entire region. The agriculture sector is also clearly subject to structural changes under the Common Agricultural Policy (CAP) and its subsequent reforms. Lessons can also be learned from the concept of the multi-functionality of agriculture as underlined by Agenda 2000, an action programme geared to strengthening EU policies and providing a new financial framework for the period 2000-06. Launched in 1999 in the form of twenty legislative texts, it attempts to address the various challenges for the agriculture sector. These include: producing food, fibres and energy sources; preserving the rural environment and landscape; and contributing to the viability of rural areas and balanced regional development. From an environmental point of view, balancing these various aims is equal to improving eco-efficiency, or in other words, reducing the burden on the environment while maintaining a certain level of output (EEA 2000).

A positive example can be found in the Polish Tatra Mountains. Here, shepherds are being encouraged to maintain traditional shepherding for tourism purposes, to maintain meadows and pastures using traditional agricultural activities in the Tatra National Park and to produce local products based on sheep herding.

Traditional Agriculture in the Ukrainian Carpathians

Agriculture has traditionally played a significant role in the economy of Ukraine's Lemko, Hutsul and Boiko regions. In the 19th century, animal husbandry specialized in non-dairy cattle-raising in the Lemko and Boiko regions. In the Hutsul region, dairy cattle were bred along with sheep and horses (home of the famous 'Hutsul horse'). After the mid-1800s, differences between the various regions began to diminish. With the impoverishment of the peasantry, horse-raising replaced ox-raising, since the horse was useful in lumbering, and sheep-raising declined in western areas. By the 1950s, the structure of animal husbandry in Ukraine's Carpathian region was (nation-wide proportions in parentheses): cattle 80 per cent (75.5 per cent); hogs 9 per cent (18.8 per cent); and sheep and goats 11 per cent (6.7 per cent).

Today in the Boiko region, elevated fields are fertilized through sheep-grazing. Traces of the tree-clearing system of farming can still be found. The main crops are potato and oat, oat having been the main bread-baking grain until the beginning of the 20th century, and much animal feed is produced. The trend is to grow more potatoes and feed and less oats. In lower areas, rye and wheat are grown, while corn is the main crop on southern slopes. Soil fertility is low. The per capita supply of domestic animals is somewhat higher here than in other parts of Ukraine. Overall, production is now insufficient to feed the population while much of the arable land is left fallow.

(Source: CIUS 2006)

Forestry

Pre-transition

For centuries, the forest supplied highlanders with food such as berries, mushrooms and animals, pasture and materials and energy for small-scale industries. By the second half of the 19th century, they had become the main source of exports and a key economic resource. Exploitation of Carpathian forests intensified at the end of the 19th century when a network of narrowgauge railroads was built to transport lumber from remote mountain areas.

Because of inadequate protective measures, the forests were at times excessively exploited, particularly under the Soviet regime. For example, in the 1950s, although the Carpathians possessed only 22 per cent of Ukraine's forests, they yielded over 60 per cent of total lumber produced in Soviet Ukraine. Legacies inherited from this past include younger and thinner forests as well as clear cuts.

Carpathian Forests Today

Today, forestry remains an important economic sector in the Carpathian countries, particularly in Slovakia, Romania and Ukraine, although there are significant national and regional differences. The most forested country is Slovakia with more than 40 per cent of the total area. Ukraine has the smallest share with 16.5 per cent. Regionally, the highest shares of forested areas are located in Poland's Podkarpackie region (over 60 per cent), Slovakia's Stredne Slovensko, Ukraine's Zakarpats'ka and northeast, southeast and southwest Romania (between 50 to 60 per cent) (see Map 2.4). The average European forest cover is about 44 per cent (MFPFE 2003) (see Chapter 3, section 3.2).

Young forests and deforested areas constitute over 50 percent of forested lands, while mature forests account for scarcely 11 percent instead of the desirable 25 percent.

The primary processing of wood is declining due in part to decreases in some traditional markets and the continued use of obsolete technology. In the Ukrainian part of the Tisza River Basin, about 500 thousand cu m of timber are logged annually, mainly by small and middlesized companies, representing a local source of employment.

Forests provide a variety of products other than wood, many of which often have an important economic value. Examples include Christmas trees, mushrooms, berries, medicinal plants, decorative foliage, game meat, pelts, honey, nuts, bark for tannin extraction, birch sap, seeds, resin and tar. However, the related revenues do not always necessarily go to forest owners.

Some forest managers are taking efforts to preserve forest areas in order to preserve their natural and valuable functions such as erosion control and water retention.

Problems

The process of industrial decline in many Carpathian areas had many beneficial environmental effects such as declining pollution levels. However, forests remain vulnerable. The Carpathian forests are subject to continuous threats. In general, forestry practices vary from country to country.

In most cases, logging techniques do not meet environmental standards. In all countries, there are records of unsustainable felling methods, clear-cutting and plantation of alien species or no replanting at all. There are also examples of forest lands being converted to agricultural use, for example in Ukraine.

Forests continue to get younger and thinner. The usual method of forest exploitation is selective cutting. Clear-cutting is legally permitted only in some forest types and limited areas. Nonetheless, legally or illegally, many privately-owned forests continue to be the victim of clear-cuttings as a means of earning quick profits. Extensive





clear-cutting also often results in accelerated run-off during heavy rainfall.

For example, in Ukraine's Gorgany Mountains alone, 1 470 ha of rocky slope have appeared. Floods have increased and the importance of the mountains as a source of moisture has declined (CIUS 2006).

In the Carpathian countries, state as well as private forest stands are damaged through stealing and the collection of firewood (UNEP-ISCC 2006). Illegal logging is common and much higher than official forestry statistics show. Increasing poverty, for example in Romania, is a key driving force, where wood is used for domestic heating and fuel needs. Generally in Romania, poor management of the forestry sector and economic hardship have led to unsustainable logging to maintain the growing production, export and construction industry (UNEP-ISCC 2006).

In most of the Central and Eastern European countries, the restitution or privatisation process is still ongoing, including that related to forest ownership. Significant restructuring is taking place, including the fragmentation of ownership. One result was that many former large state complexes across the Carpathians were broken up into smaller branches which now lack sufficient capital or entrepreneurial and marketing skills (Turnock 2002).

Today, the highest share of privately-owned forest and other wooded land occurs in Romania

(70 per cent) and Slovakia (52.3 per cent). In Ukraine, all forests still belong to the state.

Solutions

Most countries have a planning, management and control system in place, which at least protects forests as a type of landuse that cannot be easily converted to other landuses. For example, in Slovakia, forests are considered to be a stock of national significance and efforts are made to protect forested areas against development and other landuse forms.

However, even in those countries where the issue of ownership has been secured by an existing legal framework, forest management is often problematic. Throughout the Carpathians, the legal framework and the sector itself are still too focussed on wood production, while the responsibilities for managing forest ecosystems are only sparsely introduced in practice.

It may be assumed that forests will be maintained and somewhat enlarged, but it is more important to enhance qualitative forest management.

Forestry practices are not generally addressed in conjunction with water management issues, despite the very close linkages that they should have within an integrated land-use management framework.

There is a double challenge to achieve sustainable forest management, particularly in the face of the fragmentation of forest ownership. This will require not only setting limits to cutting but also administering forests in the interests of all forest users. One solution is community forest management which links wood production with processing, and also better reflects the multifunctionality of forest resources such as pasture, food, fuel, building materials, recreation, carbon sequestration and biodiversity conservation (Turnock 2002).

In some countries, a low forest utilisation rate has been observed – in part because of ownership structures where small, private holdings are not intensively managed, or due to management objectives such as biodiversity conservation or improving recreational opportunities. The utilisation rate represents annual tree felling expressed as a percentage of the annual increment. The balance of annual increment and annual felling highlights the sustainability of timber production over time. It also indicates the current and future availability of timber. For long-term sustainability, annual felling must not exceed the annual increment.

Among the Carpathian countries, the utilisation rate is the lowest in Ukraine (about 33 per cent) and highest in the Czech Republic (71 per cent) (MCPFE 2003).

Marketed services have gained importance in recent years. Examples include hunting and fishing licences, managed outdoor recreation areas, and trails for mountain biking, horse riding, skiing and other recreational activities, especially in national parks and protected areas. Another is contracts made between local authorities and private landowners to promote conservation – for example, compensating shepherds for the loss of their sheep to wolves that are protected. Such services may contribute directly to the income of forest owners and thus also to the economic viability of sustainable forest management (MCPFE 2003).

Table 2.3 Removal of hon-wood forest products, 2003	Table 2.3	Removal o	f non-wood forest	products, 2005
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						Tonnes
	Mushrooms and truffles (t)	Fruits and berries (t)	Raw material for medicine (t)	Game meat (t)	Bush meat* (t)	Hides, skins and trophies (units)
Czech Republic	23 900	22 700	2 800	6 790	9574	216 570
Poland	3 276	8 745	-	8 153	10 456	-
Slovakia	8 750	15 200	-	1 673	1 688	22 470

Source: UN ECE

Note: * Poached and illegally traded

Data on the quantity and value of marketed nonwood forest products are limited in most countries (Table 2.3). Many do not collect and report data because they do not perceive non-wood forest products as economically important, and because of the difficulties and costs in collecting accurate data. At best, some countries collect data on the most important products, commercial production or exports. Personal use often accounts for the largest share. At the same time, it can be seen that non-wood forest products can be an important source of income, especially in rural areas.

Energy and Industry

Energy

In general, power production in the Carpathian region relies mainly on fossil fuels, followed by nuclear, hydro and renewable energy sources.

Some Carpathian countries hold important fossil fuel reserves, although total proven oil and natural gas reserves are limited. Romania, the largest oil and natural gas producer in the region, is an exception although oil and gas production declined considerably in the last decade (by 50 and 60 per cent, respectively). The Carpathian countries remain highly dependent on imported oil and natural gas, mainly from Russia. The geo-strategic importance of the Carpathian region lies largely in the oil and natural gas pipelines traversing most of these countries on their way to Western Europe. The 'Friendship' (Družba) pipeline transports Russian crude oil to Ukraine, Slovakia and Hungary and onward to Western Europe. The 'Brotherhood' natural gas pipelines pass through Ukraine to Slovakia and Hungary. And the 'Soyuz' natural gas pipelines pass through Ukraine to Slovakia and the Czech Republic. In



Chapter Two: Socio-Economic Driving Forces



Ukraine, serious oil and gas leakages from pipelines have been observed.

In all Carpathian countries except Romania and the former Serbia and Montenegro, between 1995 and 2002, natural gas consumption slightly increased. At the same time, the consumption of coal and coal products decreased considerably.

Over the past decade, Carpathian countries have restructured and downsized their coal industries by closing down inefficient (deep) mines and cutting down coal mining labour forces. The coal reserves of Romania and Ukraine remain significant, with most deposits located outside the Carpathian region.

In Ukraine, thermal power plants account for nearly 50 per cent of generation, while nuclear power generates 40 per cent and hydroelectric approximately ten per cent. Slovakia has become more reliant on nuclear reactors (Mochovce, Bohunice) producing around 55 per cent of the country's total electricity. In Poland, new natural gas reserves are being sought and geothermal energy is already exploited in the Zakopane area. Mining in the Hungarian Carpathians is no longer important since major deep coal mines were closed. However, opencast mining of lignite still exists in Hungary's Mátra and Bükk Mountains.

Over the years, the increasing demand for energy meant that Carpathian hydropower resources were almost fully exploited, leading to considerable losses of agricultural land, forest areas and some relocation of villages. Hydroelectric power plays a significant role in Romania, accounting for nearly 30 per cent of generation in 2001.

The Czech Republic, Hungary, Poland and Slovakia are well advanced in reaching the EU target of a 22 per cent share of renewable energy sources in total electricity generation by 2010 (European Communities 2006), with Slovakia now in the lead (see Figure 2.10).

Since 1990, energy intensity per unit of GDP has declined due to economic restructuring, technological modernisation and increased fuel prices (see Figure 2.11). However, it remains high in comparison with the EU-15 average. In Ukraine, energy intensity is now roughly double that of the other Carpathian countries.

The largest high-voltage electricity transmission line (750 kV) comes from Vinnitsa, Ukraine



Map 2.5 Electricity transmission network

through the Carpathians to Albertirsa, south of Budapest (see Map 2.5).

Industry

As noted earlier, during communism the Carpathians were marginal to main development areas and remote from most leading markets. Nonetheless, the central planning system's heavy pressure on mineral resource exploitation led to the appearance of many production centres on the edge of the Carpathians with material inputs from the USSR. For example, Slovakia became the home for a new metallurgical complex built in Košice and an aluminium plant in Žiar nad Hronom. Farmlands were also converted to make way for new industry. In the 1990s, industrial production in the Carpathian region dropped dramatically after the political changes. During this time, the main industrial centres were located in the Czech Republic, Hungary, Poland and Romania.

Today, mining and metallurgical industries have an important share in the regional economy, as do chemical, petrochemical, cement, engineering, pulp and paper, food, textile and furniture industries.

The mining industry is well-developed in Romania. Non-ferrous metals are intensively explored and exploited in the Romanian Carpathians, especially in areas such as Maramures, Gutii and the Apuseni Mountains. Non-ferrous metal mining generates much needed income within the Somes



Map 2.6 Potential accident risk spots in the Tisza river basin, with zoom in the Maramures mining region

and Mures river basins. The industry offers employment for many thousands of local inhabitants but is also a serious source of soil and water pollution. A key problem in this sector is the use of obsolete technology. To improve the sustainable use of mineral resources and the efficiency of the mining industry, some mines were selected for closure which has (and will) reduce employment in some areas (see Chapter 3, section 3.4).

The ferrous metal industry in the region is present in Hunedoara, Rožnava, Košice and Miskolc. Small-scale mining occurs in Ukraine with the extraction of salt, kaolin, mercury, gold, zeolite and construction materials. The chemical industry operates mostly in northern Hungary, Romania and southern Slovakia. The petrochemical industry, including oil refineries, storage and transportation (pipelines), is an important sector in Hungary and Ukraine.

The pulp and paper industry is present in Slovakia, Romania and Ukraine. Here, the furniture industry is one of the few economic sectors that maintained a positive trade balance in the last decade and continues to share an important part of total industrial output.

Cyanide Spill in Baia Mare

In 2000, Baia Mare and Baia Borsa, Romania became the site of the largest accidental spill of chemicals in the Carpathians ever. Here, the walls of the tailing dams of two gold mining companies collapsed. As a result, significant amounts of cyanide and heavy metals spilled into and contaminated the rivers Somes, Tisza and Danube, mostly in Romania and Hungary, and to a lesser extent in Serbia, before reaching the Black Sea. Ongoing debates continue between Hungary and Romania over compensation from the 2000 spill as well as over the opening of a new gold mine in nearby Rosia Montana, Romania.

The damages arising from mining operations are now being more fully acknowledged, including pollution generated by non-ferrous metallurgical smelters in Serbia, Slovakia and Romania. Some parts of the Eastern Carpathians with heavy mining legacies exhibiting lunar-like landscapes have created problems for exploiting the area's high tourist potential. Fortunately, in many parts of the Carpathians, threats from mining operations are now greatly reduced as uneconomical mines are closed down (see Map 2.6).

Transport Infrastructure

Overall, there is a general lack of highway systems, and existing national road networks require improvements. Important road routes that cross the Carpathian region are the European E60, E671, E673, E68, E70, E71, E79 and E81 roads. The region is also crossed by Pan-European Corridor IV which follows the route Berlin-Nüremberg-Prague-Budapest-Arad-Bucharest-Constanta-Istanbul-Salonika, approved by the European Council during its Helsinki Summit in 1999.

New road building includes the Northern Transylvanian Highway from Brasov-Cluj-Napoca-Bors to the Hungarian border; currently under construction, it will have a total length of 415 km. Through its trans-European transport network (TEN-T) plans, the EU has also proposed a new major transport corridor from Madrid to Kyiv. At the same time, new proposed road networks could lead to habitat fragmentation and potentially block biodiversity and migration corridors (WWF 2001), as might high-voltage electric power cables and badly designed and inadequately located developments such as transformer stations.

According to statistical data, road network density is the highest in some areas of the Czech, Slovak and Polish Carpathians. These are about four times higher than in the Hungarian, Romanian and Ukrainian parts (see map 2.7).

The stock of passenger cars in the Carpathian countries rose significantly from 16 million in 1995 to over 22 million in 2003 (see Map 2.8).



Map 2.7 Road network density in the Carpathians, 2003

In 2003, the Czech Republic had the highest number of cars per capita at 36 per cent, while Romania showed the lowest figure at 13 per cent. The two counties around Bratislava and Budapest showed the highest peaks because of the influence of the two capital cities, while the northeastern and southern regions of Romania had the lowest figures.

Large disparities can be observed in the development of the rail transport network between the northwestern and southeastern parts of the Carpathians (see Map 2.9). The densest networks are found in the counties of Bratislavsky Kraj, Slovakia and Slaskie woivodship, Poland, with over 15 km of rail per 100 sq km, while the lowest densities are in Romania and Ukraine, below five km per 100 sq km, largely because of the area's geomorphological features. In general, the regional rail network shows continuous degradation due to a lack of financial sources and maintenance. There is also a tendency to close down inefficient railway branch lines, replacing them with road passenger and freight transport (UNEP 2004a).

The region's air transportation is developing well with some international and regional airports such as: Ostrava in the Czech Republic; Poprad, Sliač, Košice, and Žilina in Slovakia; Krakow and Rzeszów in Poland; Baie Mare, Cluj-Napoca, Sibiu, Suceava and Tirgu Mures in Romania; and Chernivtsi, Ivano-Frankivsk, Lviv, and Uzhgorod in Ukraine.





Most of the region does not have watercourses suitable for navigation. However, the Danube River has been identified as Pan-European Corridor VII under TEN-T, linking the Black Sea with Germany and the Rhine River to the Baltic Sea.

Tourism

Overview

Up to 1990, Central and Eastern Europe experienced a considerable expansion in international tourism, largely based on arrivals from other socialist countries. When the communist regime collapsed, this market disappeared along with a sharp decline in tourism. In the early 1990s, only a few of the most important areas, such as Beskydy in the Czech Republic and the Tatra Mountains in Slovakia and Poland, continued to attract tourists.

Today, tourism is an important economic sector in the Carpathian countries with considerable



Map 2.9 Rail network density in the Carpathians, 2003

potential. The distribution of hotel beds, with the Czech, Polish and Slovak regions having the most hotel beds, correlates with the overall development of tourism infrastructure in the Carpathians (see Map 2.10).

Differences related to the economic importance of tourism between countries and even within the same country can be observed. For example, the natural resources of the northwestern part of the region (e.g. Slovak and Polish Tatras) face heavy pressures from tourist activities. In contrast, tourism activities in the southeastern and northeastern Carpathians (e.g. Romania and Ukraine), calculated in number of tourists, are very low and thus exert little pressure on the environment. The region is rich in natural and cultural heritage. It includes four biosphere reserves and 33 national parks with an overall territory of nearly 10 500 sq km, representing about five per cent of the total Carpathian area. In 2006, the UNESCO World Heritage list contained 26 cultural and natural sites in the Carpathian region (see Chapter 1 and section 3.9 in Chapter 3).

The first protected areas, established in 1895, were the National Nature Reservation Ponická Dúbrava and National Nature Reservation Príboj in Slovakia. In the Western Carpathians, a system of protected areas was established after World War I and in 1932, Europe's first ever transboundary national park was established in Pieniny on the Polish and then Czechoslovak border.



Map 2.10 Hotel beds in the Carpathians, 2001

Overall, the protected area network is denser and better-managed in the northwestern part of the Carpathians than in the southeast.

The region's cultural diversity is almost as great as its biodiversity. People of different religions, languages, customs and traditions live together. The Second World War considerably destroyed this ethnographical variety, especially in the Eastern Carpathians, but many attractive historical monuments survive (Chapter 3, section 3.9).

It includes a wide variety of destinations, tourist facilities and products. Because of the region's healthy climate and natural beauty, the Carpathians provide excellent opportunities for health and wellness development, including an abundance of thermal mineral springs – carbonic acid, salt, iodine salt, bitter and petroleum. The most famous springs are in Hungary's Miskolc-Tapolca, Slovakia's Bardejov, Pieštany in Poland Krynica, and Băile Tuşnad and Băile Herculane in Romania.

Eco- and adventure tourism revolve around the numerous mountains and forests across Romania. Many mountainous areas are virgin lands, untouched by pollution where fresh air and beautiful sites abound. The Carpathian mountain range offers good quality ski resorts and a full range of winter sports. The most important Transylvanian city in the Carpathian Mountains in Romania is Brasov. Here in winter, nearby ski resorts such as Poiana Brasov, Sinaia and Predeal are filled with tourists. During the spring, summer and autumn months, tourists come to the Carpathian Mountains to enjoy hundreds of kilometres of pristine alpine meadows, forest, lakes and valleys. The main leisure activities are hiking, hunting and fishing. Tourists either stay in hotels, motels, hostels, pensions or campsites. In Romania, rural tourism was developed only after the 1989 collapse of communism. Already, it can provide accommodations for some 10 000 tourists. Many domestic tourists are interested in rural tourism because it is generally less costly than other forms.

In Serbia's Carpathian region, 'farm tourism' is the most developed rural tourism product, especially in areas with undeveloped economies. And Serbia's National Park Djerdap has attractions and facilities proving it to be a tourist resort unique for the whole of Europe and the world.

The Ukrainian Carpathians, frequently referred to as the 'Ukrainian Alps' for their beautiful landscapes, microclimate and comfortable geographical location, are famous for their walking, cycling, water, spa, horse riding (especially the special hutsul or 'Hutsulyk' breed) and welldeveloped rural and cultural tourism possibilities, including 'green village tourism' (Omelyan 2005, WWF 2001).

Excessive pressure in some areas rendered more accessible by cable cars and through the promotion of winter sports has caused some degradation of rich flora.

Solutions

The main limitation for the tourism sector's development is poor infrastructure, difficult accessibility and low levels of standards, skills and management. Transportation and accommodation facilities need to be developed to make proper use of the rich natural potential of the region. Local job opportunities and incomes could then increase.

The economic attraction of tourism is persuading many communities, particularly in the northern Carpathians, to develop new tourist facilities with new and improved road networks.

Efforts should be made to boost sustainable tourism that goes beyond simply supplying beds and restaurants to protecting more landscapes, wildlife and cultural heritage and providing local organic products.

Transboundary National Parks and Tourism

In 1992-93, a large area in the Tatra Mountains was designated a UNESCO Trans-boundary Biosphere Reserve. It now extends beyond the two original National Parks on each side of the boundary between Poland and Slovakia – Tatrzanski National Park in Poland and Tatra National Park in Slovakia. Tourism is its most important economic activity. The Polish side receives some three million tourists annually. In Slovakia, the total is roughly five million. Walking and winter skiing are important activities. Over 600 km of hiking trails can be found on the Slovak side alone. Tourist resorts and hotels abound on both sides of the border.

Another outstanding example of sustainable tourism was the first trilateral reserve in the world and largest European reserve – the Polish-Slovak-Ukrainian International East Carpathian Biosphere Reserve (ECBR) completed in 1998. The reserve area encompasses Europe's largest natural beech forest complex and its most important refuges for large animals living in primeval habitats. Endemic and threatened plant species and communities, unique fauna, including all native big predators, as well as large native mammals, constitute its natural value of global importance. Cultural heritage is preserved, such as remnants of Lemko and Boyko rural and sacral wooden architecture, as well as traditional land-use patterns and pastoral practises. The ECBR encompasses an area of 2 132 sq km and the following protected areas: Poland's Bieszczady Mountains National Park and Cisna-Wetlina and San River Valley; Poloniny National Park and its buffer zone in Slovakia; and Uzhans'ky National Park and Nadsans'ky Regional Landscape Park in Ukraine.

(Source: Omelyan, S. 2005)

Traditional Economic Activities

The Carpathian Mountains represent an important refuge for biodiversity. This includes the development of a wide variety of animals and plants that were traditionally bred for agricultural purposes. However, the rapid economic transformation in agriculture resulting from privatisation and modern farming techniques pose a number of threats.

Among unique animals living in the region, the Hucul (Hutsul) horse population, known as the "pony of the Carpathian Mountains", includes about 500 individuals, while world-wide only some 800 can be found. Buffalo cows number about 70 000 in the Romanian Carpathians and only 160 in Hungary. Conservation programmes are underway to protect the traditionally domesticated Red mangalica (mangalitsa) pig in Romania's Apuseni Mountains and Saddleback and Blond mangalica pigs in Hungary.

In addition, Truskova (Wallachian) sheep account for 45 per cent of the Romanian sheep population. In Romania's Brasov and Covasna counties, Trigai (Cigaja) transhumance sheep (with shepherds practicing vertical seasonal livestock movement) are found. Other traditional sheep varieties include the Carpathian sheep in Ukraine's Chernivtsi oblast, the Polish mountain sheep (Valaska) and Racka sheep in the Hungarian Carpathians. Some 60 per cent to 70 per cent of all sheepdog breeds live in Bukovina, a region shared by Romania and Ukraine. Romania has the largest goat population (700 000 individuals) living together with the transhumant donkey.

In the context of subsistence agriculture and rural industry, particular importance was traditionally attached to fruit growing and viticulture. Interestingly, even domestic architecture was affected, with two-story houses often accommodating drying kilns and fermentation areas below living spaces.

Traditional varieties of fruit trees in the Carpathians represent a genetic treasure to be conserved. Old fruit varieties, selected to withstand harsh environments, became adapted to local soil and climatic conditions, possess good quality and taste and are resistant to diseases and parasites. Rural people use about 20 species of fruit trees such as apple, pear and cherry.

Unfortunately, the last 50 years witnessed dramatic decreases in the diversity of wild fruit plants. Many local valuable genotypes were lost because of the collectivisation of agricultural land and development of pasture farming. Fruit plant populations now consist mainly of very old trees, at times over 100 years old (Monitoring Institute for Rare Breeds and Seeds in Europe 1999).

Brandy distillation in the Romanian Carpathians remains one of the few activities that have retained a significant role. Under socialism, peasants were allowed to make a "borhot" which they delivered to central distilleries and for which they received payment in distilled products. Many farmers now make their own brandy in small home stills. Throughout the Carpathians, wild cherries found in the hills are often used for brandy-making, as are plums, apples and pears.

Plant species have also provided resources for textile crops such as wool, flax and hemp from which a wide range of goods were regularly produced including winter clothing, blankets and covers.

Woodworking has been an important type of local production in Carpathian villages, especially for building homes and cattle shelters and wood carving. In most parts of the Carpathians, every village had generations of timber specialists and a variety of related trades such as joiners, wheelwrights, shuttle-makers and coopers. The collection of non-wood forest products such as mushrooms and berries has also provided revenues for mountain people.

The existence of skilled stone masons goes back to prehistoric times, later apparent in the production of domestic items such as stone fireplaces and bread ovens in peasant houses. Practices such as the production of lime in kilns and furnaces, as well as charcoal, are referred to in the Middle Ages throughout the Carpathians. Pottery making is another important craft central to Carpathian rural life (Turnock 2002, Muica et al. 2000).

Traditional Knowledge and Activities: Czech White Carpathians

Stretched along the Czech-Slovak border at the western edge of the Carpathian Mountains, the White Carpathians are characterised by deciduous forest and speciesrich grassland which harbour over 30 rare orchids and 250 varieties of fruit trees. In Hostetin, a small village of 250 inhabitants, the Veronica Ecological Institute and other civic organisations initiated a range of local sustainable development projects. Their main objective was to preserve the gene pool of different species of fruit trees and to promote organic farming and landscape stewardship. Another important aim was to strengthen the rural economy by creating new jobs and income opportunities for villagers, facilitate the marketing of traditional local products, and raise public awareness of local heritage and its close connection with preserving the environment. Hostetin is gradually becoming a model for sustainable development. Its organic juicing plant, the first in the Czech Republic, is only one of several smallscale projects.

In 1998, an association of NGOs together with local fruit producers launched a programme called 'Traditions of the White Carpathians', aimed at promoting and preserving the area's cultural and natural heritage. A regional brand name was launched to market local high-quality traditional products, promote the region and accelerate its development. Branding helped to create demand for local products among tourists and residents, and was key to the development of small enterprises and the survival of traditional handicrafts and food production (Ruzicka, 2006).

Examples of products labelled with the 'Traditions of the White Carpathians' brand are dried fruits, mutton produced in Moravian Wallachia, traditional crafts, and the award-winning apple juice produced in Hostetin, a flagship product now sold in major supermarkets throughout the country. In addition to providing seasonal jobs for many residents and supplementing the incomes of local orchard owners, the organic juice processing plant is an important feature of a larger strategy to preserve the rich diversity of some 250 varieties of fruit that are native to the White Carpathians. In 2003, this product was awarded the Organic Product of the Year distinction by the Czech Environmental Partnership Foundation.

Another popular activity in the region is the St. Nicolas Fair. Today, it is the most popular local fair featuring crafts, foods and traditions of the region. Visitors can enjoy the popular local plum brandy 'slivovica', taste 'frgále' pear cakes, and play cymbal music. Other sustainable development projects in the region include a biomass heating plant, ecological reed-bed sewage treatment facility and traditional fruit drying kiln.

(Source: www.tradicebk.cz, http://hostetin.veronica.cz/)



2.3 Societal Driving Forces and Pressures

Population Trends

ver the last 15 years, population trends in the Carpathian countries have generally been characterized by features such as high rates of population loss in Romania and Ukraine and slight decreases or stagnation in Hungary and Slovakia. This is seen as a negative pressure, as healthy populations are needed to preserve cultural and economic traditions, especially in mountain areas.

Since 1991, Ukraine has lost roughly ten per cent of its population, or some 4.5 million people, leading to a serious demographic crisis. During the same time period, the Romanian population decreased by seven per cent (see Figure 2.12). In both countries, international migration was a key contributing factor. For example, between 1975 and 1999, nearly 700 000 people emigrated from Romania, most of them Romanians, Germans and Hungarians (Ethnic Mobility in Romania 2004). Migration has increased in recent years due to the scarcity of work opportunities in the poorest areas of the basin, and the proliferation of job offers in more economically developed areas, for example Romanians and Ukrainians crossing into Hungary or outside of the basin.

Population density varies significantly from region to region. Those with the highest population density are located in the Czech and Polish Carpathians, with over 175 inhabitants per sq km. The lowest densities occur mainly in the Romanian Carpathian, with less than 100 inhabitants per sq km (see Map 2.11).

In all Carpathian countries, males on average have shorter lives compared to female populations. At the same time, there are wide variations, for example, between male life expectancy in the Czech Republic at 72 years compared to only 60 years in Ukraine.

In the early 2000s, the highest infant and child mortality rates were observed in Romania, the former Serbia and Montenegro, and Ukraine.



Ukraine had nearly double the rates of the other Carpathian countries (see Figure 2.13).

A general tendency in the Carpathians is the ageing of the population, with some regional discrepancies. For example, at the national level, the proportion of the young population under 25

in Serbia is the highest among the Carpathian countries (see Figure 2.14).

There is a large Roma (otherwise known as "Gypsy") population in the Carpathians, particularly in eastern Slovakia, northeastern Hungary, western Ukraine and northern Romania. These

Linking Poverty and Environment

The poverty and environment inter-linkage is an important theme concerning how human well-being and the natural environment influence each other. Ecosystems, besides providing just goods for humans, also provide critical life-supporting services – the conditions and processes through which natural ecosystems sustain and fulfil human life. They maintain biodiversity and the production of goods such as forage, timber, biomass fuels, natural fibres, pharmaceuticals and industrial products. They provide life-supporting functions such as cleansing, recycling and renewal, and confer many intangible aesthetic, spiritual and cultural benefits and values.

All people – rich and poor, living in developing or developed countries – depend on ecosystem services. However, this is only true in the long run. In the short run, the poor are more heavily dependent on these services. For example, the rich can buy clean water or the technology to filter and purify water if it is contaminated. The poor, on the other hand, have limited resources to pursue these options and must usually depend on natural water systems and/or public water supply systems, many of which do not meet the minimum standards for human consumption, especially in developing countries.

The same can be said for extreme natural events like floods, storms, heat waves and extremely cold winters. These tend to have a bigger impact on the poor because they do not have the resources to build appropriate shelters or because their homes are built on land where the natural barriers to landslides and floods have been destroyed. In the last decade, an increasing number of flood events adversely affected poor as well as old people. One of the most vulnerable groups is the Roma.

Furthermore, poor women and children suffer disproportionately in acquiring dwindling natural energy supplies for cooking and heating. The suffering is amplified by the greater amount of time they spend in badly ventilated shelters when using highly polluting fuels like coal and firewood. (Source: Duraiappah 2002)





are some of the poorest regions of their respective countries and suffer from high unemployment and economic underdevelopment (Pomázi et al 2006). Communities are vulnerable, as residents are victims of poverty, social exclusion and discrimination. Addressing these concerns is becoming an increasingly important socio-political issue for national and sub-regional governments. Effectively integrated land and water management applied in a sustainable manner would be one of the tools that could be used to alleviate poverty in the region. Roma are far fewer in number and less controversial in Poland. Estimates of their population in Poland range from 15 000 to 50 000. In contrast, Roma in the former Czechoslovakia numbered 500 000 in the 1980s when Poland became a transit point on the illegal migration route from Romania to Germany. The emigration of Polish Roma to Germany in the late 1980s reduced Poland's Roma population by as much as 75 percent.



Figure 2.13 Life expectancy, infant and child mortality, early 2000s





Rural De-population and Land Abandonment

'Rural areas' in the Carpathians are sparsely settled places, distinct from the urban influences of large cities and towns and distinct from unsettled lands such as outback or wilderness. People live in villages, on farms and in other isolated houses, as in pre-industrial societies. Today, many rural areas focus on agriculture, although their economies may also be based on logging, mining, petroleum and natural gas exploration or tourism.

Relative to urban areas, rural areas are characterised by higher levels of poverty and lower prices and levels of power. Inequality is growing between rural and urban areas for many reasons. During the transition period, rural conditions throughout the region deteriorated. Most of the Carpathian region's poor now live in rural areas. Rural populations are generally in decline, largely because of migration to urban areas and other countries in the search for employment. Migration has been a predominantly male phenomenon. Impacts include women now making up a large percentage of the rural poor and rural populations increasingly represented by women and the elderly. Furthermore, households are increasingly headed by seniors and pensioners,



while rural household members are much older than those in urban areas.

High unemployment is a common feature of rural areas. In most Carpathian countries, the agriculture sector accounted for the greatest decline in employment. Rural villages suffered, particularly those where agricultural concerns and heavy industries, many now obsolete, were the main employers.

Lifestyles in Carpathian rural areas differ from those in urban areas, mainly because of limited services. Rural infrastructure has often experienced considerable deterioration. Many rural roads, irrigation systems and erosion control measures remain in poor condition. Originally designed to suit the cultivation of large tracts of land, they have not undergone the reconstruction required to suit the newer and smaller family farms on the rise in rural areas.

Public services such as police, schools, fire stations, community centres and libraries may be distant, limited, suffering from lack of attention in scope or simply unavailable. The same holds true for water and sewerage facilities, street lighting and public waste management, as well as public transport, as many people use their own vehicles, walk, cycle or even ride animals such as horses and donkeys. Power and water systems are prone to frequent breakdowns.

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Furthermore, much of the environmental damage that occurred in rural areas during the socialist period has not been repaired. Large-scale cultivation destroyed field roads, watercourses, vegetation belts and other landscape features suitable for individual farming. Production centres were often placed in the heart of villages with adverse ecological impacts. Environmental degradation at times increased during the transition period, for example through the deforestation of valuable species, inappropriate tillage of soils and a failure to maintain a balance of nutrients in the topsoil (FAO 2003).

One of the main threats – maybe even the most crucial one – that mountain territories now face is the abandonment of agricultural lands and traditional farming practices. This phenomenon reflects a post-war trend of rural depopulation and the marginalisation of wide agricultural regions. 'Marginalisation' is a process in the sense that it affects areas which were not marginal in the past. In other words, it means 'becoming marginal' as opposed to 'being marginal'. This is of fundamental importance when analysing land abandonment and its economic and environmental consequences. For example, if previously cultivated or otherwise semi-managed lands are neglected, then the unique biodiversity that has become adapted to those lands could be lost; basically, the ecosystem could become almost completely restructured.

From Farming to Tourism in Poland

In 1990, the Polish Carpathians as a region had one of the best rural demographic and economic situations in Poland, as indicated by population growth, the advantageous gender and age structure, low unemployment rate and good housing standards. Today, population growth in Poland, especially in the Carpathian area, is practically zero. Village residents regularly migrate as more youngsters flee to cities looking for work.

A major concern has been the worsening agricultural situation complicated by the unfavourable natural conditions of the mountainous terrain, fragmentation of holdings and low level of efficiency. As food production on the more fertile soils of other areas in Poland is sufficient, the likelihood of the further abandonment of mountainous lands by farmers is high, as numerous examples from Western Europe prove.

On the other hand, tourism is a positive factor in the socio-economic transformation of the Carpathian countryside. It was a significant activity even before the Second World War when lodgings were sought in private houses in many villages of the Sub-Tatra, Podhale Basin and the Silesian and Sacz Beskides. The villages currently active as tourist centres show the most dynamic development and the highest level of socio-economic infrastructure (Kurek 1996).

The same holds true for Poland's Bieszczady Mountains where lands have become less valuable for agriculture. Focusing the area's high aesthetical values on tourism is now probably the best way to use the potential of its landscape. Tourism infrastructure should be developed with the aim to attract more visitors for numerous recreational and sporting activities in the summer and winter. Local residents have already realised the opportunities, reflected in the growing number of agro-tourist accommodations in the mountains and foothills. (Source: Janicki 2005)

The abandonment of traditional farming activities results in a number of impacts which can be summarized as follows: increasing natural hazards; loss of productive lands; diminishing terrain value; loss of natural capital and environmental quality; depletion of environmental services; loss of open or otherwise accessible spaces suitable for various purposes such as tourist, recreation and sporting activities; loss of local, typical products and traditional farming practices; diminishing habitat variety and biodiversity; decline of traditional lifestyles and knowledge; permanent loss of cultural landscape; loss of cultural and social heritage and identity; and a decline of human presence and its consequent territorial care in the mountains (Conti, Fagarazzi 2004).

Overall, efforts to enhance the quality of rural life in the Carpathians must include improvements to agricultural production, employment, infrastructure, environment and housing.

Environmental Democracy

Information Access

Since the 1990s, there has been increased interest in the Carpathian countries devoted to understandable and usable environmental information. Much can be attributed to the entry into force of the Aarhus Convention in 2001 which obliges signatory governments to provide citizens with access to environmental information (see Table 2.4). All EU Member States are also now obliged to meet the requirements of the Convention.

In all of the Carpathian countries, state of the environment (SoE) reports are available in printed and electronic form. The Czech Republic annually publishes SoE reports at the national, regional and urban (large municipalities) level, as well as a statistical yearbook on the environment. Underlying data are updated periodically while the form of the reports is modified annually and the sets of indicators are further developed. In Hungary, environmental statistical yearbooks and reports using environmental indicators (i.e. key, main and headline environmental indicators) are regularly published at the national level.

In Poland, SoE reports include a national report every four years and voivodship reports yearly or biannually. Slovakia publishes yearly SoE reports at the national level. In Ukraine, annual SoE reports are published at the national and oblast level. In Romania, annual SoE reports are published. Serbia does not publish regular SoE reports.

Table 2.4 Status of Aarhus Convention in the Carpathian countries

	Ratification	Accession
Czech Republic	2004	—
Hungary	2001	—
Poland	2002	—
Romania	2000	_
Serbia and Montenegro	_	_
Slovakia	_	2005
Ukraine	1999	_

Source: Aarhus Secretariat 2007

New Technologies

New information and communication technologies play an increasing role in accessing information about the environment in the Carpathians, including the internet, personal computers and cellular phones. However, large differences are visible. Most of the Carpathian countries lag behind the EU average in terms of personal computer and internet use (see Figures 2.15 to 2.17). As another example, Slovakia's number of personal computer users per 100 inhabitants is ten times higher than that in Ukraine (Aarhus Secretariat 2006).





NGOs

In the last 15-20 years, civic initiatives, movements and non-governmental organizations (NGOs) have been strengthening in the Carpathian region. Environmental NGOs are particularly important at the local level where they are often represented on local councils and are able to influence environmental decision-making. Many NGOs have also established good working relationships with governmental institutions and international organizations, for example in Serbia. Environmental NGOs have significantly raised the level of public awareness about the environment and have contributed to the development of local environmental action plans. Many, such as the Serbian Ecological Society and the Danube Environmental Forum, have contributed to an improved dissemination of environmental information through their websites and publishing activities (REC/EURAC 2005).

The 'Carpathian Foundation' is a unique, crossborder regional organization that provides grants and technical assistance to projects which result in tangible benefits to communities on both sides of national borders in the Carpathian Mountains in Hungary, Poland, Romania, Slovakia and Ukraine. Support goes to NGOs and local governments. The Foundation strives to improve the quality of life of people in cities and small towns, focusing primarily on inter-regional, economic development and transboundary activities. It encourages the development of public-private-NGO partnerships, including cross-border and inter-ethnic approaches to promote regional and community development and to help prevent conflicts. It also promotes good relations, social stability and economic progress in the bordering regions.

In Romania, the Carpathian Foundation from Brasov developed ecological education projects for the Carpathian region in the framework of the Carpathian Large Carnivores Project. NGOs have also developed ecological education projects through the framework of the Regional Centre for Ecological Surveillance (CRSE), a network of NGOs working on nature conservation in Romania's Apuseni Mountains (REC/EURAC 2005).

Much has been done in the Hungarian Carpathians by civil society, especially in the framework of a large carnivore project concentrating on lynx and wolf, run by the University of Gödöllő.



This EU LIFE project, 'Funding the base of long-term large carnivore conservation in Hungary', focuses on the monitoring and reintroduction of these large carnivore species in northern Hungary. Bird Life International (Hungary), with its regional affiliated society, is also active in the region, as are the member organisations of the Central and East European Working Group for the Enhancement of Biodiversity (CEEWEB).

Also in Hungary, the Ecological Institute for Sustainable Development has a number of projects involving protected area management, habitat restoration and networking between NGOs. The Friends of Nature NGO has a volunteer-based nature protection programme that helps maintain access to protected areas for hikers by managing paths and route signs. The National Society for Conservationists, a network of organisations including NGOs such as Marcel Loubens Barlangkutató Egyesület, Miskolci Öko-kör and Green Action Hungary, is also active (REC/EURAC 2005).

In Ukraine, a number of NGOs are carrying out educational activities geared to fulfilling the goals of the Carpathian Convention. These include the Bukovynian affiliate of the National

Ecocentre "Krona" (Chernivtsi region), Sokolyata, Eco-play, Edelveys, Nash Dim, Nadvirna District Society of Live Ethics, Eco-Gal-Ostwind (Ivano-Frankivsk oblast), Zeleniy Svit, WETI, Ecopravo-Lviv, Mama-86, Society of Nature Protection, Children's Ecological-Naturalistic Centre (Lviv region), Ecosphera, a branch of the Eco-Center in Khust and many others. Environmental awareness-raising, particularly related to Carpathian Convention implementation, is being carried out by the charitable information-publishing centre Zelene Dosie (Green Dossier) (REC/EURAC 2005). The Charitable Foundation Ecopravo-Lviv consults citizens and NGOs on their environmental rights and how to protect them, organizes seminars and trainings and produces publications for related issues.

The environmental NGO "Eco-Ex" in Zakarpatska oblast was established in 1994 by the teachers of ZOENC (Eco-Eks Teachers' Educational and Tourist Association). Its mission is to assist in the renaissance of school groups of young naturalists involving teachers and students in practical nature protection events and actions, promote the environmentally rational use of nature, and increase environmental awareness and culture.



Figure 2.17 Telephone lines and cellular phone subscribers per 100 capita, 1990–2004

Some Ukrainian NGOs have become active in local decision-making. For example, Ecosphera, Nash Dim, Western Centre of World Laboratory, Ecopravo-Lviv and regional organizations of the Ukrainian Company of Protection of Nature have participated in decision-making at the regional, national and international levels. This includes involvement in the Public Boards of Regional Environmental Administrations, communicating positions, comments and proposals, protesting undesirable plans and projects, and participating in public hearings and international workshops. In recent years, environmental NGOs have developed a number of initiatives and networks in the region. One of them is the South Eastern European Environmental NGOs Network (SEEENN) which endeavours to coordinate environmental NGOs on a regional level. Another is the SEE NGO Electronic Network whose goal is a stronger, better organized and more coordinated environmental NGO community.

Besides environmental and cultural civic organisations, a wide range of other institutions (e.g. universities, academic institutions) have also dealt with scientific research activities in the Carpathians.

Conclusions

Current development patterns in the Carpathian region are leading to a loss of traditional knowledge, livelihoods, practices and values. It is therefore critically important that culturally sustainable and coherent policies be formulated and implemented for the Carpathians, in order to halt and reverse this trend before it is too late. Rural de-population threatens the preservation of the traditional character of the Carpathian countryside. Emerging issues include the illegal cross-border transport of natural resources such as timber from Ukraine, species under CITES, secondhand technology (e.g. personal computers, mobile phones, old refrigerators) and waste. Land fragmentation is also a major threat, as new land ownership patterns result in owners prioritizing economic over environmental concerns. New infrastructure development is another further cause of habitat loss and fragmentation and species loss in the Carpathians.

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