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Medicinal and Aromatic Plants in Albania, Bosnia-Herzegovina, Bulgaria, Croatia and Romania

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Medicinal and Aromatic Plants in Albania, Bosnia-Herzegovina, Bulgaria, Croatia and Romania

A study of the collection of and trade in medicinal and aromatic plants (MAPs), relevant legislation and the potential of MAP use for financing nature conservation and protected areas

Wolfgang Kathe, Susanne Honnef & Andreas Heym

(WWF Deutschland / TRAFFIC Europe-Germany)

This study was carried out by WWF Deutschland and TRAFFIC Europe-Germany on behalf of the German Federal Agency for Nature Conservation (BfN), Bonn and Vilm.

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[…] Ich wollte nicht mal Geld verdienen. Ich wollte nur meine Schulbücher haben. 7 Kilo Kamille war der Preis. War der Preis zu hoch ? [...]
Später trank ich nur noch Lindenblütentee. Es half nichts. Als erstes mußte ich unbedingt einen guten Kamillenpflücker finden. Dieses Gerät, ausgerüstet mit einem rostigen Eisenkamm mit neunundzwanzig Zähnen, bestand aus einem primitiv zusammengehauenen Kasten. Der Holzkasten wog fast zwei Pfund und faßte zwei bis drei Pfund Kamillenblüten. Mit einer schwungvollen Bewegung führte ich den Eisenkamm durch die Kamille, zog den Kasten hoch, und etwa dreißig Blüten fielen in den Bauch des Holzkastens. In drei Stunden hätte er den Bauch voll haben können. Mein Arm war längst lahm, ich atmete schwer, schwitzte vor Anstrengung und maß die Zeit in Kamillenblütengramm. Mein Sommer hieß Kamille und wog 7 Kilo – von Mitte Juni bis Mitte September.[...]

[from: RUMJANA ZACHARIEVA: 7 Kilo Zeit. pp. 8/9]

[…] I even didn't want to earn money. I just wanted to get my school books. 7 kilogrammes of camomile was the price. Too high? [...]
Later I drank nothing but linden flower tea. No use. First, I definitely had to get hold of a good camomile-picker. This appliance, equipped with a rusty iron crest with twenty-nine teeth, was a primitively assembled box. The wooden box weighed almost two kilogrammes and could hold two to three pounds of camomile. Full of verve I swung the iron crest through the camomile, pulled the box up, and about thirty flowers fell into the stomach of the wooden box. Within three hours it could have filled its stomach. My arm had gone numb long since, I breathed heavily, the strain made me sweat and I measured time in camomile-flower-gramme-units. My summer was called 'camomile' and weighed 7 kilogrammes – from mid-June till mid-September. [...]

[translated from: RUMJANA ZACHARIEVA: 7 Kilo Zeit. pp. 8/9]

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Preface

The use of and trade in medicinal and aromatic plants is an issue where conservation and development interests meet and where sustainability can only be achieved by sharing responsibilities and acting jointly. Germany as a major importer of medicinal and aromatic plants holds particular responsibility for the sustainability of the trade. This is the reason why the Federal Agency for Nature Conservation has been addressing the issues of trade in medicinal and aromatic plants over the past years by a range of activities.

A major source region for medicinal plants imported by Germany is Southeast Europe. The political changes over the past 15 years have offered both new opportunities and threats for utilization of medicinal plants. In SE Europe, medicinal and aromatic plants have the potential to contribute substantially to the national and local economy. In rural areas, the collection, use, processing, and trade is an important component of the livelihoods of marginal groups. From a conservation perspective, the use of medicinal plants is probably the only way to guarantee the maintenance of habitats with a high conservation value. Many medicinal and aromatic plants grow on extensively cultivated land, such as meadows. These habitats are threatened by intensification of agriculture, which would result in the extinction of many medicinal plants. Only if we succeed to put a high value on these plants, incentives arise for maintaining the extensive land use in such habitats.

Protected areas ideally offer a sound legal and scientific framework to manage the sustainable use of medicinal and aromatic plants by setting quota and extraction zones and by controlling and monitoring the collection. Furthermore, protected areas could also benefit from medicinal plants collection in two ways: The collection in protected areas offers employment and income opportunities, which depend on the conservation of the very resource. This might lead to a better understanding in the local population of the necessity for conservation measures. On the other hand, licencing the collection of medicinal plants in and outside protected areas could yield additional income for their conservation budget. This could help to financially support the protected areas in Southeast Europe, which are heavily underfunded.

The Federal Agency for Nature Conservation commissioned WWF Germany to conduct a study on the situation of medicinal and aromatic plant utilization in Southeast Europe and its potential to support both rural livelihoods and conservation objectives. The study is an excellent source of reference and it provides a solid foundation for further activities related to promoting sustainable use and trade of medicinal plants in the region and elsewhere. It is also a timely contribution to the sustainable use debate within the framework of the CBD. This study was intensively discussed during a subsequent seminar at the International Academy for Nature Conservation Isle of Vilm in December 2002 with 29 representatives from protected areas, conservation authorities, NGOs, herbal companies and consultants from Southeast Europe. The proceedings of the seminar are available on CD-ROM (contact: Gisela.Stolpe@bfn-vilm.de).

Finally, I would like to thank the many contributors to this study for their input, which has lead to such a useful publication.

Prof. Dr. Hardy Vogtmann
President of the Federal Agency for Nature Conservation

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2 Summary

Albania, Bosnia-Herzegovina, Bulgaria, Croatia and Romania are remarkably rich in their biological, ecological and landscape diversity and are home to outstanding natural bio-resources such as a large number of herbs, medicinal, cosmetic and aromatic plants (MAPs). However, the wild stock of many MAP species has declined during past decades; some species have become rare or endangered because of habitat loss or modification, overexploitation, soil erosion and other factors.

Harvesting of medicinal and aromatic plants from the wild is an important economic factor in rural areas of all five countries. Except for Romania, wild-harvesting clearly exceeds the cultivation of MAPs in terms of annual harvest yields. Bulgaria and Albania are, in terms of quantities, the two leading exporters of MAPs in Southeast Europe. Bulgaria figures also among the 10 most important exporting countries for MAPs, worldwide. Domestic processing or semi-processing of MAP raw material still plays a subordinate role compared to raw material exports, with Romania being an exception if the processing of MAPs sourced from both wild-collection and cultivation (including spice herbs) is taken into account.

The medicinal and aromatic plant species wild-collected in the largest quantities are presently sage (*Salvia* spp.; Albania and Bosnia-Herzegovina), Common Juniper (*Juniperus communis*; Bosnia-Herzegovina), Dog-rose (*Rosa canina*; Bulgaria), Nettle (*Urtica dioica*; Croatia), Field Shave-grass (*Equisetum arvense*; Croatia), Bilberry (*Vaccinium myrtillus*; Romania) and Raspberry (*Rubus idaeus*; Romania). Wild-harvesting of MAPs is largely carried out by the local population, chiefly persons belonging to poorer groups in society, people over 50 years of age or ethnic minorities such as the Romanies in Croatia. To some collectors, the wild-harvesting of medicinal plants provides a much needed additional income, to others it is the sole source of income, especially in Albania and Bosnia-Herzegovina, where the economic situation in most rural areas is still disastrous and the unemployment rate is very high. As a rule, one or more intermediate traders and wholesalers are involved in the chain of custody of MAP trade; direct marketing by individual collectors or collectors' co-operatives is uncommon. As a consequence, the share of the export price earned by individual collectors is usually low.

Control of MAP harvesting from the wild is exercised either directly by regional inspectors of the administrative authorities (Bosnia-Herzegovina, Bulgaria, Croatia, Romania) or a forest police / inspectorate (Albania) or indirectly by collecting taxes (Bulgaria, Romania), certification systems, or by species-specific permits or licences (Bulgaria, Croatia, Romania) issued either by the state ministry responsible or by regional administrative authorities. During the last decade of the 20th century, all five countries have developed a comprehensive system of laws and other regulations related to environmental issues and nature conservation. Except for Bulgaria, the implementation and enforcement of legal instruments is rather ineffective. This holds especially true for Bosnia-Herzegovina, which is still in the general process of re-structuring following the end of the 'Bosnian War'. Law enforcement in Bosnia-Herzegovina stands on particularly shaky ground due to ongoing ethnic tensions and a complicated administrative structure.

In order to protect rare, vulnerable or endangered species, quota systems have been introduced in Bulgaria, Croatia and Romania. Quotas are species-specific and set up annually, depending on current population development, on climatic and other factors; these quotas may relate to certain regions (Bulgaria, Romania) or to the whole country (Croatia), and are set and issued by the state ministries responsible or regional governmental bodies (often in co-operation with scientific institutes). At national level, a monitoring system for MAP wild-collection activities exists only in Bulgaria, where it is reported to work satisfactorily. In Romania, there is a regional monitoring system based on the issue of collection permits.

Except for Bosnia-Herzegovina, all countries studied have a fairly well developed system of protected areas, which have mostly been re-designated according to IUCN categories during recent years. However, protected area management structures are – with only few exceptions – still not well developed and often operate on very tight budgets, if they have an independent budget at all. Harvesting medicinal and aromatic plants and other non-timber forest products (NTFPs) from the wild in protected areas is prohibited by law in Bosnia-Herzegovina and Croatia. In Albania it is mostly permitted in national parks, but often prohibited in other protected areas. In Bulgaria, apart from local restrictions, the collection of MAPs from the wild is allowed in protected areas, except for biosphere reserves. The Romanian juridical practise remains unclear to a certain extent. Medicinal plant wild-collection in protected areas is basically allowed or at least tolerated if individuals collect them for their private use. However, there seems to be a limited and probably legal commercial use of MAPs and other NTFPs in some protected areas in Romania. In Bulgaria, a share of the revenues from the trade of MAPs and other NTFPs from protected areas can be diverted to the protected areas management authorities to be used for nature conservation purposes. In all other countries, official income generated by taxes or licences is transferred to the state budget. In order to demonstrate different options and problems related to the consideration of revenues from MAP trade for protected area financing, several pilot projects were studied.

As long as there are no clear management plans for protected areas and for the sustainable use of medicinal and aromatic plants, a general promotion of the concept of partly financing protected areas by revenues gained from the commercial trade of MAPs seems to be premature, because in most cases it cannot be guaranteed that the ecological, social, and economic aspects of sustainability will be taken into consideration. However, the further development of such financing mechanisms for protected areas generated by the trade in MAPs collected close to protected areas or throughout the country may be worth considering in order to create incentives for maintaining traditional land use, which can be a prerequisite for the long-term survival of certain MAP species, and in order to find methods how the sustainable use of bio-resources could financially contribute to the protection of biodiversity.

Zusammenfassung

Albanien, Bosnien-Herzegovina, Bulgarien, Kroatien und Rumänien sind außerordentlich reich an biologischer, ökologischer und landschaftlicher Vielfalt und beherbergen eine Vielzahl natürlicher biologischer Ressourcen, unter anderem auch viele Heil-, Aroma-, Kosmetik- und Gewürzpflanzen (im folgenden 'Heil- und Aromapflanzen' genannt). Die Wildvorkommen einer Reihe von Heil- und Aromapflanzen sind jedoch in den letzten Jahrzehnten zurückgegangen; einige Arten sind selten geworden oder in ihrem Bestand gefährdet, unter anderem weil ihre natürlichen Habitate zerstört oder verändert wurden, die Pflanzen übersammelt wurden oder die Bodenerosion zunahm.

Die Wildsammlung von Heil- und Aromapflanzen ist ein bedeutender wirtschaftlicher Bestandteil in den ländlichen Gebieten aller fünf untersuchten Länder. Mit Ausnahme Rumäniens überwiegt, bezogen auf die jährlichen Sammelmengen, in allen Ländern die Wildsammlung deutlich gegenüber dem Anbau. Bezogen auf das jährliche Exportvolumen an Heil- und Aromapflanzen sind Bulgarien und Albanien die führenden Exportländer in Südosteuropa. Bulgarien befindet sich auch unter den 10 weltweit führenden Exportnationen für Heil- und Aromapflanzen. Die teilweise oder vollständige Weiterverarbeitung des Pflanzenrohmaterials im Land spielt in den untersuchten Ländern eine gegenüber dem Export der Pflanzenrohware untergeordnete Rolle. Falls man die Erntemengen der aus Wildsammlung und aus Anbau gewonnenen Heil- und Aromapflanzen zusammennimmt, stellt Rumänien wiederum eine Ausnahme dar.

Die gegenwärtig in den größten Mengen gesammelten Heil-, Aroma- und Gewürzpflanzen-Arten sind Salbei (*Salvia* spp.; Albanien und Bosnien-Herzegovina), Wacholder (*Juniperus communis*; Bosnien-Herzegovina), Rose (*Rosa canina*; Bulgarien), Brennnessel (*Urtica dioica*; Kroatien), Wiesenschachtelhalm (*Equisetum arvense*; Kroatien), Heidelbeere (*Vaccinium myrtillus*; Rumänien) und Himbeere (*Rubus idaeus*; Rumänien).

Die Wildsammlung von Heil- und Aromapflanzen wird fast ausschließlich von der ortsansässigen Bevölkerung durchgeführt, besonders von Personen, die ärmeren Bevölkerungsgruppen angehören, Menschen über 50 und ethnischen Minderheiten wie etwa den Roma in Kroatien. Einigen Sammlern verhilft die Wildsammlung von Heil-, Aroma- und Gewürzpflanzen zu einem dringend benötigten Zusatzeinkommen, für andere ist sie sogar die einzige Einkommensquelle, besonders in Albanien und Bosnien-Herzegovina, wo die wirtschaftliche Lage in den meisten ländlichen Gebieten nach wie vor katastrophal und die Arbeitslosenquote sehr hoch ist. Im Regelfall läuft die Handelskette im Heil- und Aromapflanzen-Handel über einen oder mehrere Zwischenhändler und Großhändler; der Direktabsatz durch einzelne Sammler oder Erzeugergemeinschaften ist unüblich. Aus diesem Grund ist der Anteil am Exportpreis, den Sammler verdienen, für gewöhnlich gering.

Die Wildsammlung von Heil- und Aromapflanzen wird entweder direkt durch regionale Inspektoren der Verwaltungsbehörden (Bulgarien, Kroatien, Rumänien) oder einer Forstpolizei / einem Forstinspektorat (Albanien) durchgeführt, oder indirekt mittels Steuern (Bulgarien, Rumänien), Zertifizierungssystemen, oder durch Ausstellung von artspezifischen Genehmigungen oder Sammel-

Lizenzen (Bulgarien, Kroatien, Rumänien), die entweder vom zuständigen staatlichen Ministerium oder von Regionalverwaltungen ausgestellt werden können. Im letzten Jahrzehnt des 20. Jahrhunderts entwickelten alle fünf Länder ein umfangreiches System von Gesetzen und anderen Bestimmungen, die für Umwelt- und Naturschutz von Bedeutung sind. Außer in Bulgarien ist die Umsetzung der gesetzlichen Bestimmungen bisher jedoch ziemlich uneffektiv. In besonderem Maße gilt dies für Bosnien-Herzegovina, das sich nach dem Ende des 'Bosnienkrieges' noch im allgemeinen Restrukturierungsprozess befindet. Die Umsetzung von Gesetzen bewegt sich in Bosnien-Herzegovina wegen anhaltender Spannungen zwischen den unterschiedlichen ethnischen Gruppen und wegen der komplizierten Verwaltungsstruktur des Landes auf besonders unsicherem Grund.

In Bulgarien, Kroatien und Rumänien sind Quotensysteme eingeführt worden, um seltene oder gefährdete Heil- und Aromapflanzen-Arten zu schützen. Diese Quoten werden jährlich in Abhängigkeit von der aktuellen Bestandsentwicklung, von klimatischen und anderen Faktoren festgelegt und können auf bestimmte Gebiete (Bulgarien, Rumänien) oder das ganze Land (Kroatien) bezogen sein. Sie werden von den zuständigen staatlichen Behörden oder Gebietsverwaltungen ausgestellt (oft in Zusammenarbeit mit wissenschaftlichen Institutionen). Auf Landesebene gibt es nur in Bulgarien ein 'Monitoring'-System, das offensichtlich zufriedenstellend funktioniert. In Rumänien gibt es ein regionales 'Monitoring'-System auf der Grundlage der erteilten Sammelgenehmigungen.

Außer Bosnien-Herzegovina verfügen alle in dieser Studie untersuchten Länder über ein relativ gut ausgebautes Netzwerk von Schutzgebieten. Die meisten Schutzgebiete sind in den letzten Jahren entsprechend der IUCN-Kategorien definiert worden. Mit wenigen Ausnahmen sind jedoch die Verwaltungsstrukturen der Schutzgebiete nicht gut entwickelt und die Verwaltungen müssen zudem oft mit einem schmalen Haushalt auskommen. Die Wildsammlung von Heil- und Aromapflanzen und anderen Nicht-Holz-Waldprodukten (NTFPs) ist in Bosnien-Herzegovina und Kroatien in Schutzgebieten gesetzlich untersagt. In Albanien ist sie in den meisten Nationalparks erlaubt, in anderen Schutzgebieten aber häufig verboten. In Bulgarien ist die Wildsammlung von Heil- und Aromapflanzen in Schutzgebieten erlaubt, abgesehen von einigen örtlichen Einschränkungen und von Biosphärenreservaten. Die rechtliche Praxis in Rumänien ist zu einem gewissen Grade unklar. Die Wildsammlung von Heil- und Aromapflanzen in Schutzgebieten ist im Prinzip erlaubt oder wird zumindest toleriert, falls sie nur von Einzelpersonen durchgeführt wird und zum Eigenverbrauch bestimmt ist. Es scheint darüber hinaus aber auch in gewissem Umfang eine möglicherweise legale gewerbliche Wildsammlung von Heil- und Aromapflanzen und anderen Nicht-Holz-Waldprodukten in Schutzgebieten zu geben. In Bulgarien kann ein Teil der Einkünfte aus dem Handel mit Heil- und Aromapflanzen und anderen NTFPs aus Schutzgebieten den Schutzgebietsverwaltungen zufließen, um Naturschutzaufgaben zu finanzieren. In allen anderen Ländern werden die Einkünfte der öffentlichen Hand aus Steuern und Lizenzen dem Staatshaushalt zugeführt. Um verschiedene Optionen und Probleme zu demonstrieren, die mit der Verwendung von Einkünften aus dem Heilpflanzenhandel für die Finanzierung von Schutzgebieten zusammenhängen, wurden mehrere Pilotprojekte untersucht.

So lange es keine klaren Managementpläne für Schutzgebiete und für die nachhaltige Nutzung von Heil- und Aromapflanzen gibt, erscheint eine Förderung der Teilfinanzierung von Schutzgebieten

durch Einkünfte aus dem gewerblichen Handel mit Heil- und Aromapflanzen verfrüht, da gegenwärtig eine ausreichende Berücksichtigung ökologischer, sozialer und wirtschaftlicher Nachhaltigkeits-Gesichtspunkte in den meisten Fällen nicht gewährleistet werden kann. Eine Weiterentwicklung derartiger Finanzierungsmechanismen für Schutzgebiete durch den Handel mit Heil- und Aromapflanzen, die in der Nähe von Schutzgebieten oder im ganzen Land gesammelt werden, kann langfristig überlegenswert sein, um Anreize für die Beibehaltung traditioneller Bewirtschaftungsformen zu schaffen, die eine Voraussetzung für das langfristige Überleben einzelner Heilpflanzenarten sein können und um Methoden zu finden, wie die nachhaltige Nutzung von biologischen Ressourcen zur Finanzierung des Schutzes der Biodiversität beitragen kann.

3 Introduction

The use of medicinal and aromatic plants (MAPs) in Europe for cosmetic, medicinal, colouring and aromatic purposes has a long tradition. MAPs are also used in herbal teas, food supplements, liquors, bitters, insecticides, fungicides, essential oil products, perfumes, flavouring liquids, varnishes and cleaning products. In Europe, at least 2,000 MAP taxa are used commercially, 1,200-1,300 of which are native to Europe (LANGE 1998a, 1998b).

The Balkans are among the most important export regions for medicinal and aromatic plants in Europe. During the 1990s, no less than 8 % of the total global MAP export volume were exported from Eastern and Southeastern Europe (LANGE 2002; see also LANGE in section 8 of this study). West and Central European countries in particular import large quantities of MAPs from the Balkans. Traditionally, wild-harvesting of MAPs predominates in this region (LANGE 1998a, 1998b, 2001, 2002). However, much has changed over the past 10 years once the state-controlled system of collection and trade had lost its overall influence following political changes in the former Warsaw Pact / COMECON states (BERNÁTH 1996, LANGE & MLADENOVA 1997; LANGE 1998a). These changes affected the whole region, even those countries that had not been Warsaw Pact members, such as Albania. In recent years, further changes in MAP trade have been caused by the war and subsequent political changes in the former Yugoslavia, mostly affecting Bosnia-Herzegovina, Croatia, Federal Republic of Yugoslavia, Former Yugoslav Republic of Macedonia (FYROM) and – to a lesser extent – Albania and Slovenia.

The harvesting and trade of MAPs in the Balkans has at least three equally important dimensions: the ecological, the social and the economic issues. For a sustainable development of MAP harvesting, all three dimensions have to be considered. As a result of over-harvesting, land conversion, erosion and other factors, the populations of some MAP species traditionally collected in the region have declined considerably; some species have become rare, threatened or vulnerable. This development endangers not only the plant species and their ecosystems but also the economic livelihood of people involved in MAP collection and trade. Most harvesters belong to poorer or under-privileged groups in society and quite often depend on the additional income generated by wild-harvesting of MAPs. However, trade in medicinal plants is also an important factor in the countries' political economics. Consequently, overexploitation of these natural resources has a negative impact on the plant species, the welfare of the harvesters and the economy of the countries.

Taking these developments into account, strategies have to be established that guarantee the long-term availability of MAP species as natural resources on a sustainable level. Some countries, such as Bulgaria, have already reacted and developed systems for licensed or quota-controlled (and species-specific) collection and trade of some MAP species (LANGE & MLADENOVA 1997). In other countries, however, no such measures have yet been taken.

Nature reserves and other protected areas (PA) are a special form of (unspecific) 'protection'. Depending on their status and the legislation applicable, harvesting of MAPs in these areas may be

totally banned, permitted under certain conditions or promoted. During the era of state-control in the former Eastern Bloc countries, in Albania and the former Yugoslavia, the protected areas were state-financed, albeit at a low level (LANGE 2001). The political and subsequent economic changes in Eastern and Southeastern Europe since 1989 have caused a decrease of public funding for protected areas. The authorities in charge of PA management were confronted with the necessity of finding new financial strategies in order to become more independent of the scarcer state funds and – if possible – achieve financial self-sufficiency (LANGE 2001). Among other financial sources, it may in some cases be possible to use part of the revenues gained from the trade of MAPs from PAs to support the financing of these areas.

This study will concentrate on MAP collection and trade in five countries in the Balkans: Albania, Bosnia-Herzegovina, Bulgaria, Croatia and Romania. It will provide current data and investigate the amount of MAP raw material collected in and traded from or within these countries and especially consider MAP harvesting in or near protected areas in order to find out whether there is the potential to use part of the revenues from sustainably harvested MAPs as a re-investment for the protected area.

This study will give only a rough overview of the current situation and practices in the collection of and trade in MAPs in the five countries selected, and will try to find evidence for the potential for using sustainable MAP collection and trade to provide financial support to protected areas; for this purpose, pilot projects will be described. This study will also compile basic information and material for a seminar on 'the sustainable use of MAPs to support protected areas in South East Europe' at the International Academy for Nature Conservation, an affiliate of the German Federal Agency for Nature Conservation. This seminar was held on the Isle of Vilm, Germany, in December 2002. Proceedings of the seminar are available from Gisela.Stolpe@bfn-vilm.de.

4 Methods

This study was initiated by the German Federal Agency for Nature Conservation, which commissioned WWF/TRAFFIC Europe-Germany to carry out the research and compile the study. Due to the short span of time available for the first step in the research (roughly eight weeks, between early July and late August 2002), WWF/TRAFFIC decided to contract local co-ordinators in each of the five countries to undertake translation work and local research.

WWF/TRAFFIC developed a questionnaire (PA-questionnaire) for interviews with managers or similar persons in charge of the administration of protected areas. This questionnaire was handed to the local co-ordinators together with a list of questions that were to be answered by the local co-ordinators. While the PA-questionnaire focused on harvesting and trade of medicinal and aromatic plants (MAPs) in or near protected areas, the list of questions referred mainly to the current MAP wild-harvesting and trade in the whole country. Through these questionnaires, WWF/TRAFFIC intended to receive up-to-date information on the following issues:

a. Distribution, structure and categorisation of protected areas in the country
b. Current status (species and volumes) of MAP harvesting and trade
c. Control and monitoring of MAP harvesting and trade
d. (National) legislation applicable to MAP harvesting and trade (including the implementation of these regulations)
e. Pilot projects for sustainable wild-collection and trade of MAPs, preferably in protected areas

As local co-ordinators were chosen:

Albania (AL): **Zamir Dedej**, Director of the Nature Resources Administration and Biodiversity Directorate, Ministry of Environment, Tirana.

Bosnia-Herzegovina (BiH): **Dragana Pećanac**, GTZ Local Expert in Bosnia & Herzegovina, Banjaluka (Republika Srpska).

Bulgaria (BG): **Petar Zhelev**, Department of Dendrology, University of Forestry, Sofia.

Croatia (HR): **Zlatko Šatović,** Department of Seed Science and Technology, Faculty of Agriculture, University of Zagreb.

Romania (RO): **Andrei Blumer**, Rural and Ecotourism Officer of the Carpathian Wildlife Foundation, Zarnesti, Brasov and Ploiesti.

Constantin Dragulescu, Professor of Biology, Department of Ecology and Environmental Protection, Sibiu.

Gheorghe Coldea, Director of the Institute of Biological Research Cluj-Napoca.

According to their experience, the local co-ordinators decided which protected areas to choose for the interviews. They provided WWF/TRAFFIC with the original raw data from the interviews and the results of their own research. Further evaluation and interpretation of the data (including rating the reliability of the data collected) was undertaken by WWF/TRAFFIC, in close co-operation with the local co-ordinators and other experts.

In addition, WWF/TRAFFIC contacted a number of institutions and individual experts on questions concerning protected areas and further specialists in the field of MAP collection and trade in the Balkans in the five countries selected, in Germany and in other European countries (cf. section 1, 'Acknowledgements'). Personal information provided by these specialists is indicated in the text as '[name], pers. comm.'. In a small number of cases, the information provided by some respondents could cause trouble for them if cited together with their name. By a mutual agreement, therefore, respondents who provided such information are not cited by name in the text; instead, the citation 'Anonymous, pers. comm.' appears.

A large number of printed publications and information available on the Internet have been consulted to compile this study. Relevant publications are listed in section 15 (references, web pages) and cited in the text accordingly. WWF/TRAFFIC was assisted by a number of people who translated relevant parts of the original legal texts into English or German (cf. section 1, 'Acknowledgements').

5 Geography, Social and Political Structure, Biodiversity and Nature Conservation

The Balkans are far away from forming a geographical, social or political unit, although all countries are included in the dialogue relating to the enlargement of the European Union (EU) in a number of steps over the next decade. Bulgaria and Romania have been accepted as candidate countries for accession to the EU and are, according to the present time schedule, likely to join the EU during the second step of its eastward enlargement in 2007. Albania, Croatia and Bosnia-Herzegovina are in the 'Stabilisation and Association Process' of the West Balkans (European Commission Enlargement web page).

Figure 5-1: Schematic map of the Balkans

This chapter seeks to illustrate the differences and specific conditions of the five countries' geography, social and political structure and biodiversity, and gives a short overview of the efforts the countries have undertaken in nature conservation.

The five countries selected form part of the Balkans between the Adriatic Sea in the west and the Black Sea in the east (Fig. 5-1). The countries are rich in biological and landscape diversity. Croatia and Bosnia-Herzegovina are part of the West Balkans, share a long border and are both culturally and geographically intertwined, despite the warfare of recent years.

Table 5-1: Overview of general geographic, population, forest and protected area data of the five countries studied. Data are rounded off. For sources of the data see text.

Country	Territory [km^2]	Population [million]	Forested area [% of country's territory]	Protected areas [% of country's territory]
Albania	28,748	3.4	36	5.70
Bosnia-Herzegovina	51,128	3.4	43	0.58
Bulgaria	110,670	8.2	35	4.90
Croatia	87,677	4.8	35	6.70
Romania	237,500	20.5	26	6.08

5.1 Albania

Geography

Albania stretches 475 km along the Eastern Adriatic and Ionic coasts covering a territory of 28,748 km^2 (VASO 1998; Fig. 5-2; Tab. 5-1). 36 % of Albania's territory is comprised of forests, 24 % of arable land, 15 % of pastures and 4 % of lakes (REC 2000a). Albania has a warm climate; its landscape is formed by rocky hillsides, large mountain-ranges (up to about 2,751 metres a.s.l.) and forests (VASO 1998, SEED HQ 2000). The country is very rich in water resources, and the rivers have a high annual water flow (REC 2000a).

Economy, Administration and Social Structure

Agriculture – especially cattle-breeding – plays a central role in the country's economy (VASO 1998, KUPKE et al. 2000). The mountain ranges also provide good natural resources for medicinal and aromatic plants (MAPs). These are mostly harvested from the wild and are only rarely cultivated.

Albania suffers from considerable economic and social problems. Before its transition to a market economy in the early 1990s, Albania's industry contributed over 50 % to the national GDP. Industrial production decreased sharply after the end of the period of state-controlled economy to contribute only about 12 % to the national GDP in 1998 (REC 2000a). Today, more than 50 % of the GDP is attributed to the agricultural sector.

Figure 5-2: Schematic map of Albania. Protected areas indicated: 1 = Prespa NP; 2 = Dajti NP; 3 = Divjaka NP; 4 = Llogara NP; 5 = Lake Ohrid Protected Landscape.

No official data exist about poverty in Albania. Even if moonlighting employment is included, 62-67 % of the Albanian population is estimated to live below the poverty line of US$ 240 per month, for a family of four (REC 2000a). There are numerous links between poverty and environment degradation (REC 2000a), amongst which are:

- Deforestation, illegal hunting, loss in biodiversity, overexploitation of natural resources
- Parcelling out of arable land and fragmentation of agricultural economy; the establishment of protective measures becomes more difficult, because of the small size of many farms
- Low awareness of and decrease of interest in environmental protection and sustainability

Albania is divided into 12 prefectural regions subdivided into 36 districts (VASO 1998). The demographic trend in Albania has a serious impact on poverty: Albania's population has tripled within the last 50 years and reached 3.4 million in 1998 (REC 2000a). Together with this population development the urbanisation process accelerated, which led to a particular stress on the country's ecologically sensitive coastal and wetland ecosystems. Further destruction of the soil fertility and damage to national parks and other protected areas have been caused by over 500,000 refugees who

fled to Albania during the Kosovo crisis. Along the Adriatic coast and in western Albania, the impact of refugee-camps on protected areas is especially visible (REC 2000a). Some camps were built inside PAs like Rrushkull and Divjaka, where illegal hunting and felling became commonplace. Illegal felling to cover the demand for timber in Kosovo increasingly affects Albanian protected areas (REC 2000a). Due to a lack of funds, fire-fighting measures, preventive measures against erosion, improved water treatment and the building of cleaning plants often cannot be carried out (A. VASO, pers. comm.).

Biodiversity, State of the Environment and Nature Conservation

Albania's nature has a high biodiversity (species, ecosystems and habitats). About 30 % of all known European plant species occur in Albania, 27 species and 150 subspecies being endemic (REC 2000a). However, degradation of the environment and loss of biodiversity are considerable.

Erosion is a crucial environmental problem in Albania. It results from destruction of the vegetation, inadequate agricultural practices, the country's relief (steep mountain and hillside slopes, high mean altitude above sea level), its geology and vegetation (REC 2000a). 20 % of Albania's territory is affected by heavy erosion (over 30 tons/ha/yr) and 70 % by medium levels of erosion (REC 2000a). Areas with high environmental degradation are the hill ranges Kerraba (near Tirana), Mallakastra (near Fier), Sulova and Dumrea (near Elbasan) and the upper Shkumbini Valley (REC 2000a). Degradation is often a consequence of overgrazing by livestock, deforestation (illegal felling for fuel, wood and timber) and poor maintenance of agricultural terraces (REC 2000a).

Until the end of the state-controlled, planned economy in 1991, Albania had a poorly developed system of nature reserves and protected areas (not more than 2 % of the country's surface, REC 2000a), and overexploitation of timber and non-timber forest products caused major concern. For over 40 years (between the end of World War II and the early 1990s) natural resources were thoughtlessly exploited, industrial effluents were released untreated into the surrounding ecosystems and waste disposal was not regulated (REC 2000a).

As a reaction, the Albanian 'Law on Environmental Protection' (No. 7664) was amended in 1993 and upgraded in 1998 (SEED HQ 2000). A National Environmental Agency (NEA) was established, which issued environmental permits for enterprises and projects with an impact on the environment (SEED HQ 2000). In 2000, the NEA was transformed into the Ministry of Environment (G. VILA-STEINACKER, pers. comm.). These efforts and the changes in the political system during the last decade have not improved the basic environmental situation (REC 2000a). To date, the most seriously affected environmental components are the soil (erosion), inland waters (contamination of surface and underground waters by industrial and domestic effluents and waste discharge), forests (deforestation), coasts and urban environments (REC 2000a). Despite its exceptional richness in biodiversity, Albania is considered to have the highest rate of biodiversity loss in Europe (UNDP-GEF, SGP Country Strategy, Albania, Tirana, April 1999, cited in: REC 2000a).

Until the mid-1990s, protected areas in Albania were divided in three categories: National Forest Park, Game Hunting Reserve (A and B) and Natural Monument (WCPA web page). In 1994-95, an ecological survey of virgin forests (WB Forestry Project) was carried out; the report recommended an increase in the number and an enlargement of the territory of the existing protected areas. In 1999, Prespa National Park and Lake Ohrid Landscape protected area were established. Subsequently, a national study on the current network of protected areas in Albania was carried out, and in 2000 an 'Action Plan' was initiated. Today, there is a network of 13 national parks and 26 other large protected areas in Albania (Z. DEDEJ, pers. comm.; Tab. 10-1; Appendix A.1). The areas under protection now cover about 5.7 of Albania's territory; roughly 10 % of the country's forests and 1 % of its arable land are protected (REC 2000a). This network is still not always representative of the highest nature and biodiversity values and is poorly managed (lack of an overall PA Management Plan, of financial resources and of adequate staff training; REC 2000a).

5.2 Bosnia-Herzegovina

Geography

Bosnia-Herzegovina (BiH) lies in the centre of the former Yugoslavia and links the central plains, the mountains and the Adriatic coastal regions of the Balkans (Fig. 5-3; Tab. 5-1). BiH covers a territory of about 51,128 km^2 (26,076 km^2 in the Federation of Bosnia-Herzegovina (FBiH) and 25.053 km^2 in Republika Srpska (RS)). In both entities, about 52 % of the land is agricultural, 43 % is forest and 5 % 'unproductive area' (in 1996; REC 2000b). The majority of the country's surface is covered by mountain ranges. Only a short coastal stretch of about 20 kilometres opens BiH towards the shores of the Adriatic Sea, cutting Croatia into two sections. High mountains towards the Adriatic Sea (up to 2,380 metres a.s.l.), and the Dinaric Alps in the central and southern parts of Bosnia shape the country's relief.

Economy, Administration and Social Structure

The state of Bosnia-Herzegovina re-emerged from the former Yugoslavia after a four years' war in the early 1990s. The country underwent a transition from socialism to capitalism and market economy was introduced. During the war, BiH's economy was totally destroyed, a large number of people were forced to flee from their homes, and the infrastructure of the country was almost fully laid to ruin. In December 1995, the Dayton Peace Agreement (DPA) brought an end to the 'Bosnian War' (REC 2000b). The DPA created a complex internal political structure in Bosnia-Herzegovina. The country is made up of two separate entities, each with considerable political and legislative independence: the Federation of Bosnia-Herzegovina (FBiH), with its capital Sarajevo, and the Republika Srpska (RS) with Banjaluka as its administrative centre. The border between the two BiH-entities has a complicated course, depending on local population majorities (Fig. 5-3).

Figure 5-3: Schematic map of Bosnia-Herzegovina. Protected areas indicated: 1 = Kozara NP; 2 = Sutjeska NP; 3 = Blidinje Nature Park; 4 = Hutovo Blato Nature Park; 5 = Janj Virgin Forest; 6 = Lom Virgin Forest.

FBiH is subdivided into 10 cantons. Each of these units has its own political structure and distinct social and economic development strategies. The structure of RS is unitary and thus strategies are more straightforward than in FBiH (REC 2000b). Taxation, legislation, customs control and development strategies are governed independently in the two BiH-entities.

The 'Bosnian War' had a tremendous impact on social structures and land-use in BiH. Many people were killed, others were driven from the land or – mainly the younger generation – fled the country. Many have started a new existence abroad and will not return to BiH. Those who have remained face serious social problems: about 60 % of the population of BiH lives below the line of poverty (UNDP 1998) and 61 % of the population over 18 years of age is unemployed (REC 2000b). Public utilities often do not receive money owing to them and are therefore constantly on the verge of bankruptcy (REC 2000b). Compared to 1991, the population of BiH decreased by 9.8 % in 1999, when about 3,400,000 people lived on BiH's territory (REC 2000b). Numbers in the age groups '0-14' and '15-64' years were reduced as a consequence of the impacts of war, and the percentage of the age group '65 and over' has doubled since 1991.

Refugee settlements and SFOR camps (the UN protection forces for BiH) have been set up on agricultural land, and about 27 % of the ploughed land is mined (REC 2000b). Estimations assume a number of over 16,000 minefields and 3-6 million pieces of unexploded explosives in BiH (REC 2000b). Only a small proportion of the mines and explosives has been removed since. Consequently,

wild-harvesting of medicinal and aromatic plants (MAPs) is still a dangerous enterprise in many parts of BiH. About 47 % of the ploughed land had been abandoned by 1997, and roughly 60 % of the livestock kept in BiH did not survive the war. Minefields often prohibit work on the arable land and in forests, and many villages have been completely deserted by their former inhabitants (REC 2000b). A re-development of agriculture is expected in the future, but it has made a slow start.

Biodiversity, State of the Environment and Nature Conservation

Bosnia-Herzegovina is rich in different landscapes and ecosystems and has a high biodiversity. A specific microclimate is formed by the high mountainous barrier towards the Adriatic Sea; this area is especially rich in biodiversity. In the Dinaric Alps, three distinct eco-zones converge: the Mediterranean, Balkan and Central European (REC 2000b). Biodiversity problems in BiH are caused mainly by the loss of habitats due to overgrazing, an inadequate system for the management of protected zones and poor land-management (including illegal settling in protected areas) (REC 2000b). No post-war studies on the effects of war on plant and animal species in BiH are known because environmental monitoring is not yet well developed (REC 2000b). The compilation of a national botanical Red List was started in 1990, continued during the war and is reported to have been published in 1997. The publication is believed to list 678 vascular plant species according to the old IUCN threat categories (REC 2000b). However, this list was not available on request.

Beside water pollution and insufficient waste treatment, erosion is another major concern. About 89 % of the land is assumed to be endangered by erosion; 10 % is heavily eroded (REC 2000b). As a consequence of the very difficult political, social and economic situation of the country, nature conservation has a hard time in today's Bosnia-Herzegovina, although the number of NGOs and other organisations that are active in nature conservation and other environmental issues has increased again during the last few years.

Until 1990 only 0.55 % of the territory of today's BiH was protected. The 253 protected areas consisted of five Strict Reserves, three Managing Reservations, two national parks, 29 Special Reservations, 16 Natural Sights and 195 various (mostly very small) natural monuments (REC 2000b; see section 10.2 and Appendix A.2). During the war and the post-war period, the system of protected areas in BiH could not be improved and is therefore still rather incomplete and only partly representative of the country's ecosystems and landscapes. The administration of the protected areas is difficult, because of minefields left over from the war, the lack of staff to control protected areas, and a partial lack of infrastructure, which has remained largely unrepaired since the end of the war, especially in rural areas.

5.3 Bulgaria

Geography

The country's territory covers about 110,670 km^2. Bulgaria's population is estimated at about 8.2 million people (Tab. 5-1). Its geography is characterised by five different geo-regions. (1) The southern Danube plain in the north of Bulgaria; (2) the Balkan Mountain Range cutting through

Bulgaria in its centre, from west to east (West / High / East Balkan Mountains); (3) the southern plains between Plovdiv and Bourgas; (4) the high Rhodope mountain-range (almost 3,000 metres a.s.l.) in the southwest (south of Sofia) comprising the Rila, Pirin and Rhodope Mountains; and (5) the Black Sea coastline (Fig. 5-4).

Economy, Administration and Social Structure

Like most countries in the Balkans, Bulgaria had to face fundamental political and economic changes in the early 1990s after the end of the Warsaw Pact / COMECON. But unlike its neighbours Romania and the former Yugoslavia, these changes came about without major riots or warfare. However, the overthrow of the socialist regime in 1989 was followed by periods of instability (TSANEVA et al. 1998). Privatisation and the introduction of market economy caused the impoverishment of parts of Bulgarian society and led to social conflicts. The unemployment rate is still considerable (over 10 %), but lower than in the neighbouring countries. Since 1997, when Ivan Kostov became prime minister, the political situation has been relatively stable. The government supported market reforms and opened up towards the integration process into the European Union (TSANEVA et al. 1998).

Bulgaria's economy is based on mining and manufacturing (29 % of the total value, 27 % of the total labour force) and agriculture (12 % of the total value, 20 % of the total labour force) (LANGE 1998a).

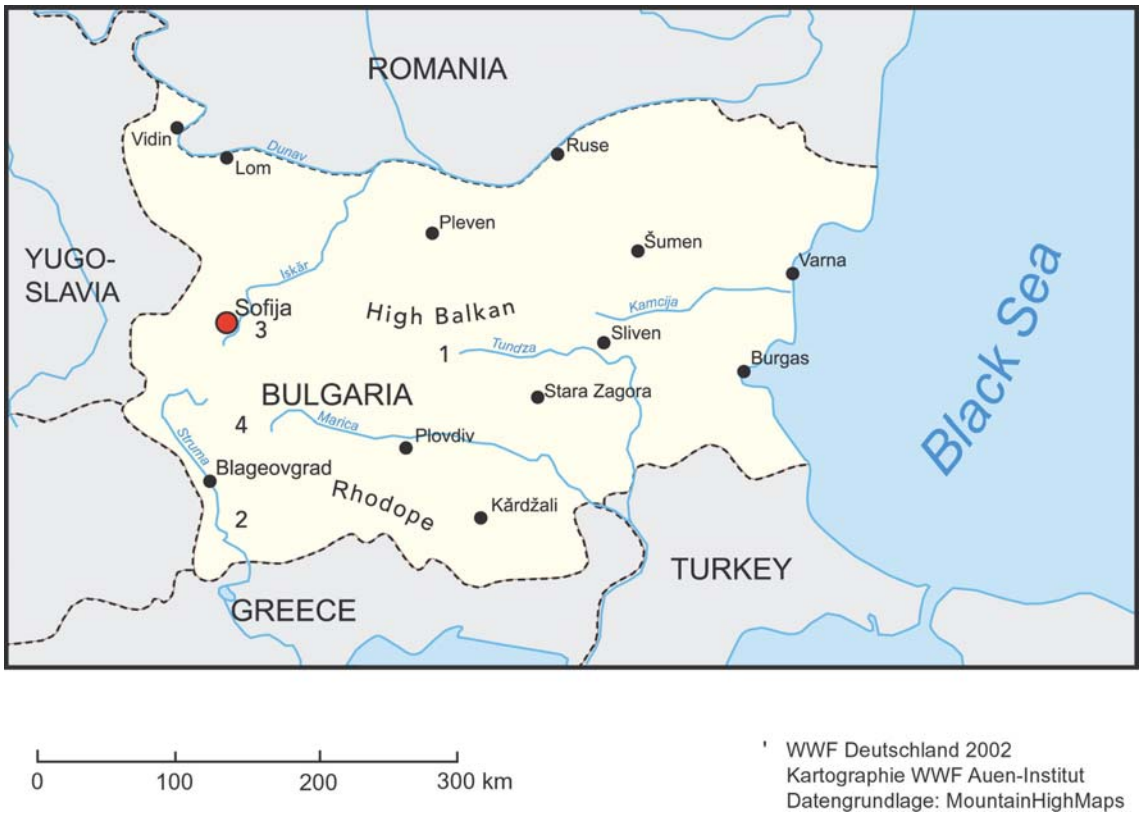

Figure 5-4: Schematic map of Bulgaria. Protected areas indicated: 1 = Central Balkan NP; 2 = Pirin NP; 3 = Vitosha Nature Park; 4 = Rila NP.

Biodiversity, State of the Environment and Nature Conservation

Bulgaria is very rich in medicinal and aromatic plants (MAPs) and other natural resources and has a high biodiversity. About 35 % of its land-territory is covered by forests (TSANEVA et al. 1998), 19 % by meadows and pastures (LANGE 1998a). Some of the forests (and the animal and plant species that live in them) are endangered, especially by mining (e.g Bobovdol, Panagjurishte and Peshtera), poaching and unsustainable wild-harvesting of NTFPs (TSANEVA et al. 1998). Forests and natural resources suffer directly or indirectly from air-pollution (sulphur oxides, nitric oxides, methane; industry and traffic), water pollution and uncontrolled waste dumping.

Compared to other countries in the region, however, the situation in Bulgaria is quite good. In 1995, a national strategy for the protection of biodiversity was adopted (HARDALOVA et al. 1994, TSANEVA et al. 1998). MAP collection and trade are largely controlled and monitored. Bulgaria has established a national system for regional quotas that fixes annual and species-specific quotas for the wild-collection and trade of endangered or not abundant MAP species in order to secure the sustainable use of these natural resources (cf. sections 7.3 and 11.3.3).

The system of protected areas in Bulgaria is comparatively well developed. At present, there are 3 national parks, 8 nature parks, 16 biosphere reserves and at least 85 further nature reserves under protection (for a list cf. Appendix A.3). It should be noted, however, that in Bulgaria the concept of biosphere reserves is somewhat different from international understanding: most of the Bulgarian 'biosphere reserves' are quite small (usually under 2,000 ha) and are under strict protection, prohibiting any form of human use, whether or not it is sustainable (G. STOLPE, pers. comm.).

5.4 Croatia

Geography

Croatia is one of five countries that gained their independence after the collapse of the former Yugoslavia in the early 1990s. Croatia covers a total surface area of 87,677 km^2; 56,610 km^2 are terrestrial land, 31,067 km^2 marine (REC 2001). The country has about 4,760,000 inhabitants (1991 census) (Croatian Bank of Plant Genes 1995). Other sources give about 4,681,000 people in 1991 (REC 2001).

57.5 % of Croatia's terrestrial surface is covered by agricultural land; 34.6 % is forested. Croatia is divided into three distinct geographical regions: the long Mediterranean coastline (mainly Dalmatia), the forested mountain-range and hilly region (e.g. Kapela Mountains), and the Pannonian Lowland (mainly Slavonia), which is the main agricultural area of the country (Croatian Bank of Plant Genes 1995) (Fig. 5-5; Tab. 5-1).

Economy, Administration and Social Structure

Today, the Republic of Croatia is divided into 20 counties plus the capital Zagreb, which is an independent administrative unit (Z. ŠATOVIC, pers. comm.). The main regions are Slavonia, Istria and Dalmatia.

Croatia has considerably suffered from the 'Yugoslav' and 'Bosnian' wars; the effects on the land were disastrous, although to a somewhat lesser degree than in Bosnia-Herzegovina. Even in Croatia, however, much agricultural land was destroyed, people who were members of the 'wrong' ethnic group were driven from their land and (mainly Croatian) refugees from Bosnia-Herzegovina crossed over into Croatia to live in refugee camps or to try to settle down. Minefields are still a problem; an area of about 6,000 km^2 was estimated still to be contaminated by mines in 2001 (REC 2001). Because of the destruction caused by the wars, Croatia's agricultural production has decreased by about 35 % (Croatian Bank of Plant Genes 1995). Croatia suffers from considerable unemployment and poverty, mainly in rural areas, although to a lesser degree than its neighbour, Bosnia-Herzegovina.

Figure 5-5: Schematic map of Croatia. Protected areas indicated: 1 = Plitvice Jezero NP; 2 = Brijuni NP; 3= Krka NP; 4 = Mljet NP; 5 = Paklenica NP; 6 = Kornati NP; 7 = Risnjak NP; 8 = Biokovo Nature Park.

Biodiversity, State of the Environment and Nature Conservation

Croatia has an outstanding diversity of species, eco-systems, habitats and landscapes. The most typical ecosystem is karst (REC 2001). Despite its high level of biodiversity, there are increasing pressures on nature and natural resources in Croatia. Even marine and coastal environments face permanent degradation as a result of terrestrial and marine pollution and the loss of habitats due to urbanisation, impoverishment of parts of the population after the war and improper management (REC 2001). Nature protection enforcement and the management of protected areas are not able to respond efficiently to these anthropogenic threats (REC 2001).

Some regions of the country are rich in medicinal and aromatic plants (MAPs). In addition, Croatia is a valuable resource for old, primitive varieties of various crop species such as *Triticum durum* and *Triticum turgidum* (Croatian Bank of Plant Genes 1995). However, as in many other countries in the Balkans, overexploitation of natural resources has increasingly threatened a number of MAP and other animal and plant species. Collecting, hunting and fishing activities are often carried out illegally (REC 2001). 47.1 % of Croatia's GDP is earned by the use of natural resources, which are heavily exploited (REC 2001). In 1994, Croatia published the 'Red Book of Plant Species of the Republic of Croatia', based on the IUCN Plant Red Data Book. 226 plant taxa are categorised as extinct, endangered, vulnerable, rare or indeterminate (Croatian Bank of Plant Genes 1995). This Red List is also used in the Croatian cantons of Bosnia-Herzegovina (FBiH; D. PEĆANAC, pers. comm.).

Croatia has established a network of national parks and other protected areas in order to protect landscapes, ecosystems, and wild animal and plant species. Today, there are eight national parks, two strict nature reserves, 10 nature parks, and over 350 other nature reserves (UNEP-WCMC; D. MATIJEVIĆ, pers. comm.; see section 10.4 and list in Appendix A.4). These protected areas cover about 6.7 % of Croatian territory (including the Adriatic island and marine territory). Some of these reservations are listed by UNESCO as world heritage sites (Velebit and Plitvice; REC 2001).

5.5 Romania

Geography

Romania is the northernmost country of the Balkans region and covers a total surface area of 237,500 km^2. The country has about 20.5 million inhabitants and its population density is roughly 86 people/km^2. Romania has three prominent relief types (mountains, hills/plateaux/plains) (CRISTEA 1995) and five large natural regions: (1) the Carpathians in the west and north, (2) the Transylvanian Alps in the southern central parts of the country, (3) the Danube Plains in the south, (4) the Black Sea coastline (including parts of the Danube Delta) in the East and (5) the Moldovan Plains in the northeast, towards the Republic of Moldova (Fig. 5-6; Tab. 5-1).

The elevation of the country varies considerably, ranging from sea level (Black Sea) up to over 2,500 metres a.s.l. in the Carpathian Mountains (NSAP 1996). The average annual temperature is 8-10°C with frosty winters (-3 to -4°C) and warm and dry summers (21-22°C on average); the annual

precipitation is 400-600 mm/m^2 (NSAP 1996). Three climate zones meet in Romania: the moderate Central European, the sub-Mediterranean Illyric, and the Irano-Turanian (CRISTEA 1995).

Economy, Administration and Social Structure

Romania is divided into 41 state controlled counties ('judete'), 260 self-governing municipalities and towns ('municipii'/'orase') and 26,688 self-governing communes ('comune') (GRIGORAS et al. 1998).

Figure 5-6: Schematic map of Romania. Protected areas indicated: 1 = Danube Delta Biosphere Reserve; 2 = Piatra Craiului NP; 3 = Retezat NP; 4 = Muntii Apuseni NP; 5 = Rodna NP.

The country has suffered from severe economic problems for almost 50 years (GRIGORAS et al. 1998). The communist period between World War II and the collapse of the Warsaw Pact / COMECON in 1989 saw a long period of economic hardship; however, after the political changes following the overthrow of the regime, the economic situation of the majority of the Romanian population deteriorated further (GRIGORAS et al. 1998). The country's transition to a market economy was fast, but all Romanian governments since 1990 failed to initiate fundamental changes that could have sustainably supported the country's feeble economy. Political turmoil made advances in reform almost impossible (GRIGORAS et al. 1998).

Biodiversity, State of the Environment and Nature Conservation

Romania is considered an important meeting point between different biogeographic regions and ecosystems (NSAP 1996), linking Europe and Central Asia. Prior to anthropogenic influences, the territory of today's Romania consisted mainly of forests (27 %) and steppe grasslands (16 %); aquatic ecosystems and wetlands accounted for about 5.8 % and alpine and sub-alpine ecosystems for about 1.2 % of the territory (NSAP 1996). Even today, Romania has the largest surface area covered by natural forests in Europe. Forest make up 26 % of the country's surface, half of which are managed for conservation rather than for exploitation purposes (GRIGORAS et al. 1998). Over 1,000 km of the Danube River and numerous tributaries contribute to Romania's wetlands, and the Danube Delta (580,000 ha, 113,000 ha of which are permanently submerged) is the largest river delta in Europe (NSAP 1996).

Today, Romania is divided into 22 eco-regions (NSAP 1996). The country has a remarkably high level of biodiversity (ecosystem, species and landscape diversity). About 47 % of Romania's territory is covered by natural or semi-natural ecosystems; some 30,000 animal species (about 1,000 of which are considered endemic) and about 3,700 plant taxa (57 of which are endemic and 171 sub-endemic) occur in Romania (GRIGORAS et al. 1998; NSAP 1996). Altogether, about 30 % of the European vascular plant flora occurs on the territory of Romania (MURARIU 2002). 283 medicinal and aromatic plant (MAP) species have been identified in the country (MURARIU 2002).

Most of the endemic species (75 %) are found in the Carpathian Mountains (NSAP 1996). Habitats with an especially high biodiversity and a considerable number of endemic species are the Rodna, Bistrita and Ceahlau, Bucegi and Piatra Craiului, Retezat-Godeanu, Cernei-Mehedinti and Apuseni mountain habitats (NSAP 1996; see also sections 10.5 and 12.3). Habitats with high biodiversity are also found in the south of Banat, the Transsylvanian Plateau, the Moldovan Plateau and the Danube gorges (NSAP 1996).

However, man has changed and in many cases destroyed natural habitats and ecosystems over the last decades in many parts of the world, with Romania being no exception. According to the 'Red Lists of Higher Plants of Romania' (issued by the Romanian Academy in 1994), 74 species are extinct, 39 species endangered and over 1,000 species vulnerable or rare (NSAP 1996). During the last 50 years, about 400,000 ha of wetlands and 250,000 ha of forestland have been lost. Forests have become reduced to one third of their original extension, wetlands to about 50 % (NSAP 1996). Human impacts such as the building of dams and artificial lakes, clear-cuttings, the extension of arable land and other activities must be held accountable (GRIGORAS et al. 1998, NSAP 1996). These modifications have reduced the abundance of certain elements of the ecosystems (especially steppe grasslands), sometimes replacing them by new ecosystems or adding new components (NSAP 1996). Today, 39.2 % of the country's surface is arable land, with a considerable proportion transformed from previously wetland ecosystems (NSAP 1996). Since 1989, economic pressures have accelerated this process. Habitat destruction may also be caused by industrial pollution (wetlands like the Danube flood-plain and Olt River), hydrotechnical works (Riu Mare in Retezat), overgrazing or uncontrolled tourism (Bucegi, Retezat, Piatra Craiului) (NSAP 1996).

Beside habitat destruction, erosion is a major problem in many parts of the country. An estimated 40 % of the arable land is affected by erosion at an average rate of 16.5 tonnes/hectare/year (NSAP 1996).

In the mid-1990s, Romania started to establish a comprehensive – if implemented effectively – system of environmental protection. In 1995, both the Environmental Protection Act was introduced and a National Environmental Action Plan was developed (GRIGORAS et al. 1998). Romania also showed its commitment to the conservation of biodiversity by signing a number of important international conventions (see section 11.1.8). However, conservation management strategies and institutional arrangements for nature conservation are still regarded as inappropriate (NSAP 1996).

The 'National Strategy and Action Plan for Biodiversity Conservation and Sustainable Use of its Components' (1996) emphasises the following problems that need to be addressed to during the development and implementation of related laws and action plans:

- Lack of a coherent policy and strategy for managing and conserving biodiversity
- Subordination of the conservation of biological diversity to activities that have major ecological impacts
- Poor law enforcement
- Lack of clearly defined organisational and institutional responsibilities for biodiversity conservation
- Lack of legislation on environmental monitoring
- Lack of economical and financial instruments to stimulate measures for the conservation of biodiversity and the sustainable use of its components

Romania has a fairly large system of protected areas. A total number of 584 protected areas of different categories cover about 6.08 % (1,444,525 ha) of the country's surface (cf. section 10.5 and appendix A.5). The largest protected area is the Danube Delta Biosphere Reserve with about 580,000 ha; Danube Delta BR is the only protected area that has a distinct conservation management plan and an appropriate reserve management (NSAP 1996). The Romanian network of protected areas is not representative of the country's natural richness and ecosystems; at present, there is no co-ordinated network of protected areas (NSAP 1996).

6 Short History of MAP Wild-Collection and Trade in the Selected Countries

The wild-harvesting of medicinal and aromatic plants (MAPs) in the Balkans looks back on a long tradition. The local use of natural plant resources for medicinal purposes is an integral part of folk medicine in the whole region. Together with the increasing importance of international trade, the use of MAPs as export goods has become more and more important during the last 100 years or more. However, for most of the first decades during this period there is a lack of accurate export statistics for all Balkan countries. After the end of World War II, most countries in the Balkans became part of the state-controlled economic structures of the former Eastern Bloc. Trade statistics are mostly available for this period. Until the early 1990s, collection of and trade in MAPs was almost exclusively state-controlled (BERNÁTH 1996; LANGE & MLADENOVA 1997; LANGE 2001). This changed immediately after the end of planned and state-controlled economy. In some countries, like Romania, collection and sales figures of MAPs decreased considerably at first, while in recent years MAP collection and trade have recovered and experienced a renaissance again, at least on the domestic market (D. LANGE, pers. comm.). A number of new, private trading companies emerged after the opening of the markets, although in most countries the former state-owned trade companies are still the market leaders (D. LANGE, pers. comm.). This basic situation is similar in all five countries selected, but in detail there are remarkable differences in the recent history of MAP wild-harvesting and trade. Accurate, species-specific annual export and import figures are, however, not always available from East and Southeast European countries (LANGE 2002).

Albania

The deeply rooted, local use of medicinal plants has a long tradition in rural Albania. Until 1992, the Tirana-based 'Institute of Popular Medicine' investigated and promoted the traditional use of medicinal plants in folk medicine (VASO 1998). Moreover, MAPs have been an important Albanian export commodity for many years. Until the early 1990s, the purchase of cultivated or wild harvested MAPs and trade in these materials were exclusively state controlled (VASO 1998, LANGE 1998a). State organisations and authorities sold the purchased plant material to the central, state-owned 'Agroexport', which exported either the dried MAP raw material or distillations thereof (KUPKE et al. 2000). Principal destinations were the former Warsaw Pact states, the former Yugoslavia and Italy. Today, both MAP export destinations and trade structures have changed in Albania. Many exports are shipped to Western European countries, and a large number of private companies have taken over the formerly state-controlled trade (cf. sections 7.1 and 9.1). The foundation of private companies followed the fundamental law on privatisation, adopted by the Albanian Parliament in 1991. The system of state-owned plant collection enterprises has ceased to exist in Albania; it has been replaced by small private enterprises or branches of foreign companies that operate on the market; some of these have already started to run their own distilleries (A. VASO, pers. comm.).

Between 1995 and 2000, Albania ranked in 15th position among the most important countries for MAP-export, with an annual average of 7,650 tonnes of dried material (UNCTAD COMTRADE database; see LANGE in section 8 of this study). Traditionally, Albania is Europe's leading sage

(*Salvia officinalis* and *Salvia fruticosa*) producer, today exporting over 1,000 tonnes annually with a market value of about US$ 2.5 million (SEED HQ 2000). Since the early 1990s and especially after the 'Yugoslav War' and the crisis in Kosovo, Albania's export figures have fallen dramatically, from about US$ 30 million to US$ 10-12 million in the late 1990s (SEED HQ 2000). The production of essential oils (mainly sage and juniper oils) has declined from 60-100 to 10-20 tonnes per annum (SEED HQ 2000). Between 1996 and 1998, Albania became one of the world's leading low-cost suppliers of St John's-wort (*Hypericum perforatum*) exporting raw material with a value of over US$ 5 million annually. Following a drastically reduced demand at the international level (mainly in the USA), the market for St. John's- wort crashed but has partly recovered in recent years (LANGE, pers. comm.). As a result, *Hypericum perforatum* was over-produced in Albania, which considerably affected the Albanian MAP export industry (SEED HQ 2000; see LANGE in section 8 of this study). As a countermeasure, Albania took over parts of the MAP trade from the neighbouring Federal Republic of Yugoslavia and Bosnia-Herzegovina during the 1990's war in the former Yugoslavia. However, exporters from these countries complain about the low costs and sometimes low quality of Albanian MAP production, discrediting the Balkans' reputation as a good or high quality MAP supplier (SEED HQ 2000, D. PEĆANAC, pers. comm.).

Bosnia-Herzegovina

The history of MAP collection and use in BiH is not well studied and documented. As in all the other countries in the Balkans, the collection of wild medicinal and aromatic plants has been an important factor for centuries. People collected MAPs to use their healing powers to cure their own diseases or provide their families or local communities with medicinal herbs. Gradually, and most probably together with the onset of industrialisation, townspeople began to lose their direct contact with nature and started depending on being provided with natural medicine by the rural population and traders. The economic value of MAPs increased. During the times of the former Socialist Republic of Yugoslavia, Bosnia-Herzegovina was mainly a provider of MAP raw material. The two state-controlled traders UPI Sarajevo and KLAS Sarajevo, or firms in Croatia purchased the material provided by local harvesters or harvester collectives and either traded it to domestic, state-owned processing firms, mainly in Serbia and Slovenia, or sold it on the international market (SEED HQ 2000). However, no reliable data are available on what quantities of the traded or exported material came from Bosnia-Herzegovina or from other parts of the former Yugoslavia. Even since the collapse of the state and the independence of Bosnia-Herzegovina in 1995, detailed, reliable collection and trade data and statistics related to MAPs have been difficult to obtain (see LANGE in section 8 of this study).

Bulgaria

Bulgaria is traditionally one of the most important countries of origin of MAPs in the Balkans. The local population has used the rich MAP wild-stock in many parts of the country for centuries (LANGE 1998a; KUPKE et al. 2000); 200-300 plant species have traditionally been used in folk medicine or by the food and pharmaceutical industries (HARDALOVA 1997, LANGE & MLADENOVA 1997). Although wild-collection of MAPs has always dominated and still prevails today, first efforts to investigate and practise cultivation of MAPs in Bulgaria started about 100 years ago in order to meet increasing

demand. Around 1900, peppermint (*Mentha* x *piperita*) was already being cultivated, followed by sage (*Salvia sclarea*) in 1907, and fennel (*Foeniculum vulgare*) in 1940 (KUPKE et al. 2000). Others like *Datura innoxia* and *Glaucium flavum* were cultivated later.

Bulgaria is a traditional producer and international supplier of high quality essential oils. The production of the famous Kazanlyk rose oil (*Rosa damascena*) has been documented since the 16th century; the oil is still produced. Since the 1960s, other essential oil products from Bulgaria entered the international market and gained economic importance, including peppermint oil and lavender oil (KUPKE et al. 2000). Until the transition from the Socialist to the Democratic Republic of Bulgaria in 1989, the two state-controlled trade firms 'Bilkocoop' and 'Bulgarcoop' had almost exclusive control of the trade in MAP raw material harvested in Bulgaria (LANGE & MLADENOVA 1997). Since then, a large number of private companies have appeared on the Bulgarian market, both at domestic and international trade levels. Some of these private companies, however, turned out to be ephemeral and disappeared again very quickly because they could not compete against the existing firms with their established trade structures (D. LANGE, pers. comm.).

Especially after the end of communism and state-control, collectors did not always align their harvesting activities with the current demand of the traders, neither with respect to the species nor to the volumes collected. Some MAP species became endangered by overexploitation. For these reasons, Bulgaria introduced (in 1991) a regional, annual quota system for the collection of and trade in certain MAP species that had become less abundant or were in danger of becoming threatened (LANGE & MLADENOVA 1997; EVSTATIEVA & HARDALOVA 1998; cf. sections 7.3, 9.3, and 11.3.3).

Croatia

As in all the other countries that were parts of the former Socialist Republic of Yugoslavia, wild-harvesting of MAPs is a traditional activity in rural areas of Croatia. In the 1930s and 1940s, Croatia turned into a prime supplier of MAPs for Central Europe and the USA (KUPKE et al. 2000). Species that were harvested in large amounts include *Arnica montana*, *Tanacetum cinerariifolium*, *Salvia officinalis*, *Matricaria recutita*, and *Gentiana lutea*. In the 1930s, Croatia was already exporting an annual 5,800 tonnes of MAPs, mainly to Austria, Germany and the USA.; by 1997, the trade had dropped to about 1,200 tonnes, nearly 50 % of which was camomile (KUPKE et al. 2000). Beside the traditional, local use of MAPs, most of the plant raw material collected was exported in dried form or processed into essential oil products (KUPKE et al. 2000). About 50 % of the total MAP export volume of the former Yugoslavia consisted of *Juniperus communis*, *Mentha* x *piperita*, *Salvia officinalis*, *Tilia* spp. (flos) and *Matricaria recutita*. The main destination countries were Germany, France, Austria, Italy and the USA (KUPKE et al. 2000). MAP raw material from cultivation has never had an important share in Croatia's total MAP trade. However, there is some tradition of cultivating species such as *Calendula officinalis*, *Anethum graveolens*, *Matricaria recutita*, *Gentiana lutea*, *Veratrum album*, *Malva sylvestris* and *Salvia officinalis* in parts of Croatia, especially in Slavonia, Istria and Dalmatia (KUPKE et al. 2000).

Romania

The tradition of using medicinal and aromatic plants in Romania can be traced back to the times of the Thracian settlements in the first century AD. In 1862, the first Romanian medicinal book was published, listing and describing 217 phyto-medicinal drugs (KUPKE et al. 2000). In 1904, the first research institute for medicinal and aromatic plants in Europe was founded in Cluj by Prof. Béla Páter (KUPKE et al. 2000), and, in 1916, the famous Romanian natural scientist and botanist, Alexandru Borza, published a first series of articles about the necessity of protecting certain regions of the Retezat Mountains; he launched the idea of establishing a national park in the Retezat area (CRISTEA 1995).

In contrast to most other countries of the region, Romania has a traditional predominance of cultivation over wild-harvesting, if spice herbs and berries are also considered to be MAPs. After World War II, the main species cultivated were *Mentha* spp., *Coriandrum sativum* and *Foeniculum vulgare* (KUPKE et al. 2000). In 1975, the state-controlled trading company 'PLAFAR' and the 'Research Institute for Medicinal and Aromatic Plants' (S.C.P.M.A.) in Fundulea were founded. PLAFAR was controlled by the Ministry of Agriculture and Food and organised wild-harvesting, cultivation and processing of MAPs (KUPKE et al. 2000). Beside PLAFAR, there were some other small companies that specialised in certain MAP cultivation projects. In the 1970s and early 1980s, Romania was one of the world's largest producers of MAPs. In 1982, about 37,500 ha were used for the cultivation of medicinal and aromatic plants; the annual production amounted to 29,500 tonnes (KUPKE et al. 2000). During these years, cultivation had a share of about 70 % in the total MAP yield of Romania. The situation changed again after the end of the communist regime and the subsequent disorganisation in Romania. Between 1992 and 1994, the area of MAP cultivation dropped from about 36,000 to about 15,000 hectares, and the production collapsed to less than 5,000 tonnes (KUPKE et al. 2000). Since 1996, the production of MAPs has slowly increased again. Today, an estimated 350 MAP species are used in Romania, about 50 of which are cultivated (KUPKE et al. 2000). Although private companies have been founded since the deregulation of the market in Romania, PLAFAR is still the largest trading company in the country (A. BLUMER and D. LANGE, pers. comm.).

7 Wild-Harvesting and Cultivation of MAPs

7.1 Albania

MAP Species Harvested from the Wild

About 250 different plant species are wild harvested for medicinal and aromatic use in Albania (VASO 1997). Many of these species are dried by the collectors and sold on local markets or in pharmacies (KUPKE et al. 2000). Medicinal and aromatic plant (MAP) species traditionally harvested in Albania include sage (*Salvia* spp.), oregano (*Origanum vulgare*) and thyme (*Thymus* spp.) (LANGE 1998a, SEED HQ 2000).

In 2001, the most frequently collected MAP species and herbs were (in terms of volume): *Salvia officinali*s, *Salvia fruticosa*, *Laurus nobilis*, *Thymus vulgaris*, *Juniperus* spp., *Urtica* spp., *Hypericum perforatum, Viscum album, Lavandula officinalis* and *Rosmarinus officinalis* (Tab. 7-1 ; K. DANO and Z. DEDEJ, pers. comm.), each with harvest yields of over 100 tonnes dried raw material.

Table 7-1: Thirteen of the most important MAP species harvested from the wild in Albania. Estimated annual quantities collected (2001).

MAP species	Estimated annual quantity of dried raw material collected [tonnes]	Plant parts used
Salvia officinalis (*1)	1,500	whole plant
Laurus nobilis	330	leaves
Thymus spp. (*2)	300	leaves
Juniperus spp. (*3)	300	fruits
Urtica spp.	280	whole plant
Hypericum perforatum	140	whole plant
Viscum album	130	whole plant
Lavandula officinalis	130	leaves
Rosmarinus officinalis	130	leaves
Capsella bursa-pastoris	115	whole plant
Malva sylvestris	110	flowers
Satureja montana	105	whole plant
Tussilago farfara	100	flowers

Data provided by K. DANO (for a complete list cf. Appendix B.1).
(*1): Most likely *Salvia officinalis* and *Salvia fruticosa* (D. LANGE, pers. comm.)
(*2): Mainly *Thymus vulgaris* (ca. 200 tonnes) and *T. serpyllum* (ca. 100 tonnes)
(*3): Roughly equal quantities of *Juniperus communis* and *J. oxycedrus* (ca. 150 tonnes each)

By far the most collected species in Albania is still sage, with about 1,500 tonnes collected from the wild in 2001 (Tab. 7-1). Other species collected in large quantities are *Origanum vulgare*, *Satureja montana*, *Melissa officinalis*, *Rosa canina*, *Achillea millefolium*, *Sideritis raeseri*, *Crataegus monogyna*, *Trifolium* spp., *Primula veris* and *Rubus idaeus* (Z. DEDEJ, pers. comm.). The decision about which species are collected depends on the region, season and current demand.

In 2001, Albania sold about 10,000 tonnes of dried MAP raw material on the international market. The main regions of collection are unknown; it is believed that MAPs are collected almost in all parts of

Albania where they grow naturally (Z. DEDEJ, pers. comm.). A detailed list of MAPs, the product-related parts and amounts currently collected in Albania is included in Appendix B.

Collectors

Wild-harvesting of medicinal and aromatic plants is still widely common with the rural population, because it creates much-needed additional income (LANGE 1998a); in some regions wild-collection of MAPs is becoming increasingly important. Most collectors belong to underprivileged social groups; it is mainly children, women and older people who are occupied with wild-collecting MAPs throughout the vegetation period from early spring to late autumn. According to a survey, the wild-harvesting and sale of MAPs is the second-most important source of income for poorer rural households in Albania (KUPKE et al. 2000). Besides villagers collecting for private purposes or directly sell the MAP raw material collected on the market, national and international companies and their collectors are active in MAP harvesting in Albania (Z. DEDEJ, pers. comm.; see also section 9.1).

Nature Conservation and Protected Species

Overexploitation of wood and NTFPs, including many MAP species, resulted in amendments to the Albanian 'Law on Environmental Protection' (in 1993 and 1998) and the establishment of a National Environmental Agency (NEA, later Ministry of Environment; cf. section 5.1), which issues environmental permits for all investment projects and subjected MAP and other NTFP collection to licensing (SEED HQ 2000). However the effectiveness of this licensing system is questionable: today, Albania faces the highest rate of biodiversity loss in Europe; at least two plant species have become extinct, 5 % of the flowering plant species occurring in Albania are considered 'critically endangered' and 18 % 'endangered' (REC 2000a).

In 1997, the 'List of Protected Species of Flora in Albania' (see section 11.3.1) has been approved by the parliament. This list defines the status of endangered plant species in Albania (Z. DEDEJ, pers. comm).

Control and Monitoring of MAP Wild-Harvesting

The Albanian 'Private Forest Development Project' has completed a number of studies (mainly carried out by Chemonics and the International Fertiliser Development Center) on the sustainable wild-harvesting of MAPs and has tried to establish and control the collection licence system; in addition, efforts have been undertaken to promote the cultivation of endangered MAP species like Yellow Gentian (*Gentiana lutea*) and orchids used for salep production (SEED HQ 2000).

MAP collection and trade are controlled on a daily basis by the Forest Inspectorate ('Law on the Forests and the Forest Service Police', cf. section 11.3.1) of the Forest Service Directorate in each prefecture. Recently, the collectors' organisation 'Albaflor' has begun to assist in the control of MAP collection and trade in order to help protect certain species or endangered populations and thereby, indirectly, promote their sustainable use; the role of 'Albaflor' in this process is not very clear (Z. DEDEJ, pers. comm.). No monitoring system has yet been instituted (Z. DEDEJ, pers. comm.).

Cultivation

Wild-harvesting of medicinal and aromatic plants in Albania accounts for over 90 % of the country's MAP sourcing; cultivation of MAPs is still uncommon. However, trading companies are requesting that the domestication and cultivation of MAP and other herb species be intensified. Prior to the political changes in 1991, rosemary (*Rosmarinus officinalis*) was cultivated on a fairly large scale by some co-operatives; once the land had reverted to private property again, the cultivation of rosemary almost ceased to exist (KUPKE et al. 2000). Today, rosemary is once again the most commonly cultivated species. Other cultivated species include lavender (*Lavandula officinalis*), thyme (*Thymus vulgaris*), coriander (*Coriandrum sativum*) and *Satureja montana* (Z. DEDEJ, pers. comm.; for estimated areas of cultivation cf. Tab. 7-2).

Table 7-2: Important MAP species cultivated in Albania.

Important MAP species cultivated in Albania	**Estimated area of cultivation in 2001 [ha]**
Rosmarinus officinalis	600
Lavandula officinalis	400
Thymus vulgaris	370
Coriandrum sativum	250
Ocimum basilicum	150
Satureja montana	107

Estimates refer to 2001 (Z. DEDEJ, pers. comm.).

It is assumed that about 40 species are cultivated, some of which, such as Pot Marigold (*Calendula officinalis*) and Common Basil (*Ocimum basilicum*) are sourced exclusively from cultivation (KUPKE et al. 2000). Detailed current data on volumes and species of MAPs cultivated in Albania are difficult to obtain (Z. DEDEJ, pers. comm.). Cultivation is almost exclusively undertaken by farmers (Z. DEDEJ, pers. comm.). There is also a certain but unknown percentage of MAPs harvested from organic farming (Z. DEDEJ, pers. comm.).

To date, no studies have investigated the social consequences intensified MAP cultivation may have on the villagers and other collectors of wild MAPs in Albania; only a small number of local collectors are believed to be able to shift from wild collecting to work on MAP-cultivating farms to earn their living (Z. DEDEJ, pers. comm.). A comprehensive concept for the cultivation of medicinal plants on the farmers' agricultural land has still to be developed. Only if reliable contracts can be established between the cultivators and the traders, may cultivation be a possible and feasible alternative to wild-collection. The farmers dread the possibility of being pressurised into cultivating medicinal plants (A. VASO, pers. comm.).

7.2 Bosnia-Herzegovina

The 'Bosnian War' had a tremendous impact on the wild-harvesting of MAPs, as well as on the use of timber and other NTFPs. The most important long-term effects of this impact are (REC 2000b):

- Complicated and diverse political and legal structures in BiH

- Poor or absent legislation on forestry, providing an opening for uncontrolled cutting and collection
- 20 % of the forest land is still mined
- Damage to natural resources by illegal cutting, collection and export of timber and NTFPs
- Poor infrastructure and logistics; low productivity

Consequences are an increase in deforestation and erosion, the further endangering of some plant species and a general loss of biodiversity. In addition, many people were killed or driven from their homeland in both cities and rural areas; with them a great deal of knowledge relating to the collection of medicinal and aromatic plants (MAPs) was lost. Some regions in Bosnia-Herzegovina are almost uninhabited today, and there are no or only little MAP collection activities in these regions. Yet, there is no survey to discover in which regions MAP wild-harvesting was most strongly affected by the consequences of the war.

MAP Species Harvested from the Wild

At least about 160-170 MAP species are native to Bosnia-Herzegovina and Croatia. Most of these species are still collected (KUPKE et al. 2000). In BiH, the vast majority of MAPs (species and quantities) are wild-harvested.

Table 7-3: Eighteen of the most important MAP species harvested from the wild in Bosnia-Herzegovina. Estimated annual quantities collected (2001).

MAP species	Main region of collection	Estimated annual quantity of dried plants collected [tonnes]	Plant parts
Juniperus spp.	Entire BiH	402.0	fruits
Salvia officinalis	Herzegovina	352.0	herb
Betula pendula	Central Bosnia	80.0-100.0	leaves
Helichrysum arenarium (*1)	Herzegovina	(dried) 35.0 (fresh) 90.0	entire plant (dried); fresh herb for essential oil production
Rhamnus frangula	Herzegovina	50.0	bark
Satureja montana	Herzegovina	46.0	herb
Sambucus nigra	Bosnia	44.0	flowers
Vitex agnus-castus	Herzegovina	27.5	flowers, leaves and fruits (fresh for essential oil product)
Tilia argentea (*2)	Eastern Bosnia	22.0	flowers
Thymus serpyllum	Entire BiH	11.0	entire plant
Crataegus monogyna / Crataegus nigra	Bosnia	10.0	fruits
Teuricum montanum	Herzegovina	5.0-6.0	herb
Plantago lanceolata	Herzegovina	5.0	leaves
Achillea millefolium	Herzegovina	5.0	herb
Verbascum thapsus (*3)	Herzegovina	1.0	flowers

Data provided by D. PEĆANAC.

(*1): *Helichrysum arenarium*: may include other *Helichrysum* species as well (*H. stoechas*; *H. italicum*);

(*2): *Tilia argentea*: synonym to *Tilia tomentosa*; *Tilia argentea* is officially only allowed to be used for herbal teas not being sold for medicinal purposes; these data may also include other *Tilia* species (D. LANGE, pers. comm.);

(*3): *Verbascum thapsus*: may include various *Verbascum* species (D. LANGE, pers. comm.).

In the late 1990s, the following MAP species were reported to be collected from the wild in larger quantities (SEED HQ 2000): Bearberry (*Arctostaphylos uva-ursi*), lime-tree (*Tilia* spp. (flowers)), nettle (*Urtica* spp. (herb)), St John's-wort (*Hypericum perforatum* (herb)), rose (*Rosa canina* (hips)), Yellow Gentian (*Gentiana lutea* (roots)), Marshmallow (*Althaea officinalis* (roots)), Hawthorn (*Crataegus monogyna*), Dandelion (*Taraxacum officinale*), Wormwood (*Artemisia absinthium*), Common Juniper (*Juniperus communis*), and Horse Chestnut (*Aesculus hippocastanum*) (SEED HQ 2000). There may have been some shift in focus as to which species were to be wild-harvested, but the discrepancy to current data (Tab. 7-3) may also be due to the difficulty in obtaining accurate information on the collection of and trade in MAPs in BiH.

Juniperus spp. and *Salvia officinalis* are – in terms of volume - by far the most intensively harvested MAP species in BiH at present (Tab. 7-3). According to local information, much larger quantities of these species than officially listed seem in fact to be collected and exported to international companies from throughout BiH (D. PEĆANAC, pers. comm.).

Collectors

Medicinal and aromatic plants are harvested either by individual, local collectors or by national or international companies. Private individuals collecting MAPs from the wild are mostly older people from rural areas, for whom the revenue from the sale of collected plants is often the only income. Families with children also collect MAPs for commercial purposes (D. PEĆANAC, pers. comm.).

At present, eight large and a number of small companies are active in collecting MAPs in Bosnia-Herzegovina; they trade the collected material on the national or international markets. These companies mostly have their own contracted collectors, who regularly provide the raw material requested by the companies (Tab. 7-4). The biggest of these companies is 'Klas' from Sarajevo, which operates several purchasing centres throughout BiH; about 1,000 collectors harvest MAPs for 'Klas' (D. PEĆANAC, pers. comm.).

Many collectors are affiliated to companies participating in GTZ-programmes (Gesellschaft für Technische Zusammenarbeit; see also 11.2.2); the collectors range in number from 50 to an estimated 10,000 with established companies and co-operatives (DUNJIC & DUERBECK 2002).

Table 7-4: Estimated number of collectors/families working for eight of the most important companies trading MAPs in BiH.

Name of company	Location	Region (collection)	Number of collectors
Klas	Sarajevo	Central Bosnia	1,000
Jolovic d.o.o.	Milici	Eastern Bosnia	800
Ljekobilje	Trebinje	Herzegovina	500
Agroplod	Stolac	Herzegovina	180
ROING	Ljubuski	Herzegovina	30
Smrcak	Zvornik	Eastern Bosnia	120
Elmar	Trebinje	Herzegovina	100
Andjelic d.o.o.	Trebinje	Herzegovina	40

Data provided by D. PEĆANAC, August 2002.

Traditional Knowledge and Training

Collectors work mostly using their own knowledge and intuition, occasionally with instructions from potential buyers. They collect and dry the plants and then sell them to the traders in a buying unit. Bosnian collectors are renowned for their long-standing experience, handed down from one generation to the next; many collectors have a special 'feel' for optimal collection periods, methods and plant selection and usually have a high level of technical knowledge about collecting and drying the raw material (DEVETAK 2001). Therefore, the quality of wild-harvested medicinal and aromatic plants in BiH is generally very high. However, there are occasional misunderstandings resulting from the different methods of communication. Collecting methods have not changed much over the centuries. Most collectors are self-educated and do not know collecting more than about 10 different MAP species (DEVETAK 2001). Education is mostly not well organised. Only one of all collectors interviewed during a survey reported that he had participated in an education programme on collecting herbs (DEVETAK 2001). Purchasers pass on to the collectors – according to the purchasers' experience and to trading companies' requests – information on what and how much MAP raw material they need. Misunderstandings or mistakes can happen when items requested and depicted in books differ from what they are perceived by the collectors. One should, however, bear in mind, that the traditional and practical experience of the collectors is often more valuable than knowledge based largely on pictures and written descriptions, which are often not correct or misleading (DEVETAK 2001 and D. PEĆANAC, pers. comm.). Some companies appear to have manuals for collectors, but they are very reluctant to give information away to interviewers because they obviously fear this could benefit their competitors on the market (DEVETAK 2001). Occasionally, training and lectures for collectors are organised by companies or international groups, but quality and quantities of collections in locations where collectors have been trained do not seem to differ from the collection results in locations where no such training had taken place.

The war that took place in the 1990s had a tremendous impact on many collectors and their families in BiH. According to field observations, good collectors have become rare, and some regions in BiH are without a single collector today (DEVETAK 2001). In addition, the collapse of the economy in BiH (low prices) and the disorganisation of the markets made many collectors stop harvesting commercially; they have started to collect for their personal use only. Many international companies that buy MAP raw material in larger quantities seem to have changed their import strategies and prefer to buy low-cost rather than high quality material, which disadvantages BiH MAP products on the international market (DEVETAK 2001).

As many collectors in BiH belong to the poorer groups of society, some have to accept any price offered to them by the trading companies or the intermediate traders working for them. This has a negative impact not only on the collectors' income but also on the training of the collectors and on the modernisation of necessary equipment (DEVETAK 2001). In addition, project funds are sometimes used for private purposes by individuals (DEVETAK 2001).

Control and Monitoring of MAP Wild-Harvesting

The wild-harvesting of medicinal and aromatic plants is only partly controlled in BiH, mainly through organic certification (about 20 companies and their collectors take part in such programmes

(D. PEĆANAC, pers. comm.). There are no effective control mechanisms operated by state institutions in BiH.

Several certification bodies are active in BiH, amongst which are IMO, KRAV, AIAB and Soil Association (D. PEĆANAC, pers. comm.). Companies certified must obey the certification bodies' rules on the controlled and sustainable collection of plants growing in the wild. The companies have to document all their activities and methods related to the wild-collection of MAPs; the certification bodies employ inspectors to control collection activities and documents (D. PEĆANAC, pers. comm.). IMO, for instance, employs two persons (one in RS and one in FBiH), who visit companies and collecting areas, participate in collectors' seminars organised by the companies and inform IMO about their observations once a week (D. PEĆANAC, pers. comm.). They also prepare the visits of IMO inspectors and visit companies together with them.

This system of controlled and sustainable collection of medicinal and aromatic plants in BiH is supported by GTZ, which has organised a team of experts who write a manual and 'Plant Monographs for Collectors' to help companies to train their collectors (D. PEĆANAC, pers. comm.). In early 2002, a working group was established in Bosnia-Herzegovina aimed at establishing a certification body at state level.

Nature Conservation and Protected Species

Except for some species used for timber production, no plant species are explicitly protected by national legislation (cf. the Forest Laws of RS and FBiH; section 11.3.2); however, a 'Red List of Protected Plant Species' in FBiH is in the pipeline, together with 'The Law on Protection of Nature' in FBiH, which already exists as a draft version (D. PEĆANAC, pers. comm.). The almanac of the 'Bureau for Protection of Monuments and Culture of NR Bosnia and Herzegovina' from 1962 (which is still valid in BiH) lists the following (not only MAP) species as being endangered on the territory of today's BiH: *Leontopodium alpinum*, *Rhododendron hirsutum*, *Adiantum capillus-veneris, Drosera rotundifolia*, *Gentiana symphyandra*[1], *Sibirea croatica* and *Notholaena marantae* (D. PEĆANAC, pers. comm.).

According to Prof. B. NEDOVIĆ (Dean of the Faculty of Agriculture in Banjaluka, RS), a study on developing a list of endangered species in BiH should be carried out; he regards *Gentiana lutea* and *Arctostaphylos uva-ursi* as presently endangered in Bosnia-Herzegovina (B. NEDOVIĆ, pers. comm.). Prof. I. ROZIĆ (Faculty of Agriculture, Mostar, FBiH) believes that also *Salvia officinalis* is endangered in BiH (I. ROZIĆ, pers. comm.). Prof. D. GATARIĆ (Director of the Agricultural Institute of Banjaluka, RS) states that, in his view, many MAP species are endangered in BiH, especially *Gentiana lutea*, *Juniperus communis*, *Hypericum perforatum*, *Veronica officinalis* and *Arctostaphylos uva-ursi* (D. GATARIĆ, pers. comm.).

[1] *Gentiana symphyandra* is a subspecies of *G. lutea*; most likely, all *G. lutea* wild-stock harvested in BiH and other countries of the region is in fact *G. lutea* ssp. *symphyandra* (D. LANGE, pers. comm.). In collection and trade statistics from the Balkans, *G. lutea* is usually listed without reference to the potential subspecies.

All MAP species regarded as endangered in BiH are still collected from the wild in the country. The collection of *Gentiana lutea* is regarded as illegal, though there is as yet obviously no legal regulation to define the species that are not allowed to be collected. *G. lutea* is mainly exported to Italy. Italian importers come to BiH, establish contacts with local companies and pay cash to obtain *G. lutea* roots, mushrooms and other NTFPs. *G. lutea* is obviously uprooted and exploited in its natural habitats in considerable quantities, leaving holes without regard to the effect on the gentian population. The material is sold directly, without any documentation, control, or payment of taxes (Anonymous, pers. comm.).

In protected areas, MAP and other NTFP harvesting is strictly forbidden (cf. section 10.3); it is believed that in some of these areas (e.g. in Kozara NP and Blidinje Nature Park) there is some (illegal) MAP collecting activity going on, however this is on a small scale and usually for private use only (D. PEĆANAC, pers. comm.). Medicinal plants are collected in the vicinity of most protected areas (Tab. 10-4).

Cultivation

Cultivation of MAPs in BiH is still a small-scale business; an area of 200-300 hectares of agricultural land is believed to be used to grow MAPs in BiH, mainly in Republika Srpska (SEED HQ 2000). In particular camomile (*Matricaria recutita*), mint (*Mentha* spp.) and balm-mint (*Melissa officinalis*) are cultivated in Bosnia-Herzegovina, especially around Banjaluka and Trebinje (Republika Srpska). In the drier Trebinje region, lavender (*Lavandula angustifolia*), fennel (*Foeniculum vulgare*) and immortelle (*Helichrysum* spp.) are also cultivated (SEED HQ 2000). Some MAP cultivation is now under organic certification, which seems to be expanding rapidly (SEED HQ 2000).

In 2002, the most important MAP species known to be cultivated in BiH were (Tab. 7-5) *Lavandula officinalis*, *Matricaria recutita* and *Origanum vulgare* (D. PEĆANAC, pers. comm.).

Table 7-5: Most important MAP species cultivated in Bosnia-Herzegovina, estimates for the area cultivated in 2002 and average annual yield (harvest data refer to dried material).

MAP species	Main region of cultivation	Territory cultivated [ha]	Average harvest/ ha [tonnes]	Annual harvest [tonnes]
Lavandula angustifolia	Herzegovina	105.0	2.5 – 3.0	262.0 - 315.0
Matricaria recutita	N. Bosnia	40.0	0.3 – 0.6	12.0 – 24.0
Origanum vulgare	Herzegovina	12.0	3.0	36.0
Mentha x *piperita*	N. Bosnia	5.0	0.3	1.5
Ocimum basilicum	Herzegovina	3.0	3.5	10.5
Valeriana officinalis	Herzegovina	3.0	(roots) 1.5 – 3.0	4.5 – 9.0
Calendula officinalis	E./C. Bosnia	2.5	0.6 – 0.8	1.5 - 2.0
Melissa officinalis	Herzegovina	2.0	?	?
Apium graveolens	Herzegovina	1.0	3.0	3.0
Petroselinum spp.	Herzegovina	0.5	3.0	1.5

Information provided by D. PEĆANAC.

In the cultivation of *Origanum vulgare*, *Ocimum basilicum*, *Lavandula officinalis*, *Matricaria recutita*, *Mentha* spp., *Melissa officinalis* and *Valeriana officinalis* mainly national companies are active. *Apium graveolens*, *Petroselium* spp. and *Calendula officinalis* are predominantly cultivated by farmers (D. PEĆANAC, pers. comm.). In Bosnia, local people have the option of cultivating MAPs and signing a contract of co-operation with national trading companies (e.g. the trading company GM from Banjaluka has 10-15 co-operative agreements with local people growing camomile) (D. PEĆANAC, pers. comm.). In Herzegovina, local people would also be interested in cultivating MAP species, but the soil is too stony to successfully cultivate MAPs in many regions (D. PEĆANAC and 'Agroplod', pers. comm.). The Herzegovinian company ROING has taken about 20 hectares on lease from the former 'Institute for Tobacco' to cultivate MAPs; the company has also several co-operative contracts (D. PEĆANAC, pers. comm.).

Some MAP species have not yet entered commercial cultivation, but are already cultivated on a very small scale on test areas: *Salvia officinalis* (1 ha); *Althaea officinalis* (2 ha), *Hyssopus officinalis* (2 ha), *Anisum vulgare* (0.1 ha), *Angelica archangelica* (1 ha) and *Levisticum officinale* (1 ha) (D. PEĆANAC, pers. comm.). *Helichrysum italicum* and *Gentiana lutea* are taken into consideration for future cultivation; farmers and trading companies suppose that there will be a sufficient market for these species to justify cultivation in BiH (D. PEĆANAC, pers. comm.; cf. section 12.2).

A shift from wild-collection to cultivation can only happen on a moderate scale in BiH. Such a shift could be dangerous, for various reasons. Many families living mainly on the wild-harvesting of medicinal and aromatic plants (about 100,000 people all over BiH) could lose their income (D. PEĆANAC, pers. comm.). Although some MAP species (such as camomile and lavender) are already cultivated in organic farming or in the process of obtaining organic farming certificates (D. PEĆANAC, pers. comm.), it may be difficult (because of a lack of organisation in BiH and of a probable lack of sufficient international demand for organically grown MAPs) to establish organic farming as the predominant method of cultivation.

7.3 Bulgaria

In Bulgaria, like in most other countries of the Balkans, the wild-harvesting of medicinal and aromatic plants (MAPs) accounts for the vast majority (75-80 %) of medicinal and aromatic plants traded at the domestic and international markets (EVSTATIEVA & HARDALOVA, in print). Only an estimated 20-25 % is sourced from cultivation (LANGE & MLADENOVA 1997). Bulgaria has a rich, large wild-stock of MAPs. Its medicinal and aromatic plants are famous for their high quality and active agent concentration resulting from the favourable climate (KUPKE et al. 2000). Today, about 750 MAP species are collected and used in Bulgaria (about 21 % of the 3,567 vascular plant species known in the country), 200 of which are economically relevant and regularly harvested, dried and processed (LANGE & MLADENOVA 1997; HARDALOVA 1997). 66 medicinal plant species are protected, 35 are currently under 'restricted regime', and 30 species are cultivated (including 10 species that are sourced from both cultivation and wild-collection) (L. EVSTATIEVA, pers. comm.).

Table 7-6: Seventeen of the most important MAP species harvested from the wild in Bulgaria. Estimated average annual quantities collected between 1990 and 1999.

MAP species	Main region of collection	Estimated annual quantity of dried plants collected [tonnes]	Plant parts used
Rosa canina s.l.	whole country	1,000	fruits
Prunus spinosa (*1)	whole country	500	fruits, flowers
Urtica dioica (*2)	whole country	450	herb
Crataegus monogyna (*3)	whole country	400	fruits, flowers, leaves
Vaccinium myrtillus	coniferous forests	300	fruits
Sambucus ebulus (*4)	all parts of BG below 1000 m el.	270	fruits
Tilia spp. (*4 ; *5)	whole country	160	flowers
Matricaria recutita (*6)	lowlands	120	herb
Artemisia absinthium	lowlands	100	herb
Hypericum perforatum	whole country	50	herb
Thymus spp.	whole country	40	herb
Tussilago farfara	whole country	20	herb
Cotinus coggygria	forests below 1,000 m a.s.l.	20	leaves
Origanum vulgare (*6)	whole country	10	herb
Primula veris (*7)	mountain ranges	7	flowers
Solidago virgaurea	mountain ranges	5	herb
Plantago spp.	whole country	2	leaves

Data provided by P. ZHELEV, August 2002, and, where mentioned, L. EVSTATIEVA, December 2002.

(*1): Information according to L. EVSTATIEVA.

(*2): Information according to L. EVSTATIEVA. Data from P. ZHELEV differ considerably. His estimations sum up to about 100 tonnes *U. dioica* (leaves) and 40 tonnes *U. dioica* (roots).

(*3): Information according to L. EVSTATIEVA. Relative quantities of parts used are not specified.

(*4): According to L. EVSTATIEVA, the annual quantity of *Sambucus ebulus* collected is less and of *Tilia* spp. is higher than given in this table. However, as no more exact data could be provided, the figures in the table are based on P. ZHELEV's information.

(*5): *Tilia* spp. comprises *T. cordata*, *T. platyphyllos* and *T. tomentosa* (P. ZHELEV, pers. comm.)

(*6) In some species, the quantities come partly from cultivation; the actual amounts being sourced from the wild and from cultivation cannot be estimated (P. ZHELEV, pers. comm.)

(*7): According to L. EVSTATIEVA, the annual quantity of *P. veris* dried flowers seems too high, because this species is under 'restricted regime' in Bulgaria.

MAP Species Harvested from the Wild

Today, the MAP species wild-collected in the largest quantities in Bulgaria are *Rosa canina* s.l. (fruits; 1,000 tonnes), *Prunus spinosa* (fruits, flowers; 500 tonnes), *Urtica dioica* (herb; 450 tonnes), *Crataegus monogyna* (fruits, flowers, leaves; 400 tonnes), *Vaccinium myrtillus* (fruits; 300 tonnes), *Sambucus ebulus* (fruits; 270 tonnes) and *Tilia* spp. (dried flowers; 160 tonnes) (Tab. 7-6). It is difficult to give exact collection data for commonly harvested species; usually, they are based on export statistics (L. EVSTATIEVA, pers. comm.).

Collectors

Wild-collection is still an important economic factor for parts of the rural population, especially for older people who sometimes depend on this additional income. Medicinal and aromatic plants are mostly collected by retired or poorer people (for economic purposes) or by individuals collecting MAPs for their personal use; the latter may belong to any social or age group (P. ZHELEV, pers. comm.). In addition, most small or medium sized regional or national trading companies employ regular individual collectors or families (Tab. 7-7) to provide the raw material for trade on request.

Table 7-7: Estimated number of collectors working for nine small to large-sized companies trading MAPs in and from Bulgaria.

Name of company	Regional/national collection	Number of collectors (estimated)
Bioprogramma	national	150
Thrakia – Export	national	100
Herba Medica	national	100
Agrotrade	national	80
Bultrade	national	50
Vitafrukt	national	50
Arkadia Herba	regional	30
Camea Ltd.	regional	20
Tetra	regional	20

Data provided by P. ZHELEV, August 2002.

Most collectors in Bulgaria are not contracted by trading companies but work on their own and sell the MAP raw material to intermediate traders. Most of the larger trading companies (such as 'Bulgarcoop') do not contract individual collectors, but buy the raw material from these intermediate traders (P. ZHELEV, pers. comm.). The total number of people involved in commercial MAP wild-collection in Bulgaria is estimated at about 400,000 (P. ZHELEV, pers. comm.).

Traditional Knowledge and Training

The wild-collection of MAPs has a very long tradition among the majority of the rural population in Bulgaria. Some collectors are still very skilled and have a wide range of knowledge about how to collect, which species are collected for what purpose and what times are most appropriate for collecting the species. However, the overall skills and the passing on of traditional knowledge have decreased over the last two decades (L. EVSTATIEVA, pers. comm.). In addition, the requirements of the trading companies (based on the requests of their national and international customers) may be different from what local collectors would provide, as might the purity of the raw material and potential by-collection of other species. This occasionally leads to misunderstandings.

Until the early 1990s, the large trading companies Bilkocoop and Bulgarcoop regularly held training courses for MAP collectors. These courses, however, almost totally stopped together with the economic transition of the country (L. EVSTATIEVA, pers. comm.). Currently, only few training programmes are carried out to inform the collectors about the requests from companies and how to meet these expectations. Some of them also aim at providing information on MAP collection to non-

specialists. For this purpose, the "Bulgarian Forest" foundation has organised a training course for collectors of non-timber forest products (supported by the European PHARE programme). The course chiefly addresses unemployed people in order to increase their knowledge about MAPs and their qualification for collecting, and gives them the opportunity to earn additional income from MAP wild-collection (P. ZHELEV, pers. comm.).

Control and Monitoring of MAP Wild-Harvesting

The wild-collection of MAPs and other NTFPs is mainly controlled through licence fees and taxes collected by the regional governmental authorities (P. ZHELEV, pers. comm.). Commercial MAP and other NTFP collection is regarded as a business and is regulated by the forestry laws, the Forestry Administration being responsible for applying these regulations (LANGE & MLADENOVA 1997). According to the law (cf. section 11.3.3) fees have to be paid for 'forestry by-products', under which denomination MAPs fall. Species-specific rates (in Leva/kg) have to be paid by the collectors (Decree No. 202/1994, Official Gazette No. 82; for details cf. LANGE & MLADENOVA 1997). In addition, the Ministry of Environment collects fees for import and export certificates to be issued for the commercial trade in MAPs and other NTFPs. These fees are laid down as a percentage of the minimum monthly wage in Bulgaria (Decree No. 132/1997, Official Gazette No. 28; for details cf. LANGE & MLADENOVA 1997). According to the relatively new 'Law on Medicinal Plants' (2000: cf. section 11.3.3) the collection has to be controlled on-site by municipalities, which have a kind of mandate from the Ministry of Environment.

There is a monitoring system for wild-collection, which is reported to operate fairly effectively. In addition, a quota system is applicable to certain species. Direct control of the wild-harvesting of medicinal and aromatic plants and other NTFPs is exercised only in protected areas, either by park rangers or personnel hired by the protected areas authorities (P. ZHELEV, pers. comm; see section 10.3).

Nature Conservation and Protected Species

As a result of the large quantities of MAPs collected from natural habitats every year, a considerable number of Bulgaria's botanical drug species are at risk of becoming endangered (LANGE & MLADENOVA 1997). According to HARDALOVA (1997), only 20 % of the MAP species occurring in Bulgaria are not threatened by wild-collection. As a reaction to this situation, Bulgaria introduced a number of restrictions and prohibitions - issued by the Ministry of Environment - on the regulation of collection, trade and export of medicinal and aromatic plants (in 1989/1991). Ordinance No. 718 (1989) updated the list of protected plant species; this list comprised 330 species, at least 37 of which are used as MAP species (HARDALOVA 1997, LANGE & MLADENOVA 1997). Currently, about 70 species are under legal protection (L. EVSTATIEVA, pers. comm.). Cutting, collecting, picking, uprooting, trading and exporting these species, either as dried or fresh material, is strictly forbidden (LANGE & MLADENOVA 1997; cf. also section 11.3.3).

In 1989, a unique quota system came into force. The quota are not published within a law but as 'Order' of the Ministry of Environment and Water (P. ZHELEV, pers. comm.). For the collection of and

the trade in endangered or not abundant MAP plant species, regional, annual quota can be set up that usually rotate annually in relation to the regions to which they are species-specifically applicable; some species were totally excluded from being harvested (for details cf. LANGE & MLADENOVA 1997). In addition to these harvesting quotas, regional limits on the collecting season can be fixed (LANGE & MLADENOVA 1997).

Consequently, the interest in the species subjected to quotas has decreased because they cannot not be obtained and sold at competitive prices, which may put pressure on these species in other countries (D. LANGE, pers. comm.). Between 1992 and 1997, the share of exported volumes of dried raw material from species subject to the quota system was about 0.1 % (or below) relative to the total MAP export volume in Bulgaria (MLADENOVA 1998). According to P. ZHELEV (pers. comm.), the quota system is effective from the nature conservation point of view and does not affect the companies negatively. However, the application of quotas is not very strict and it happens that collectors take quota for one place, but also collect plants in another (P. ZHELEV, pers. comm.).

In addition to those species listed in CITES (*Adonis vernalis*; a number of orchid species of several genera used for salep production (*Orchis militaris*, *O. papilionacea*, *O. globosa*, *O. provincialis, Ophrys* spp., *Himantoglossum* spp., *Anacamptis pyramidalis* and others (LANGE pers. comm.)), some species are also protected by Bulgarian law. These include *Gentiana lutea*, *Gentiana punctata*, *Rhodiola rosea*, *Arctostaphylos uva-ursi*, *Taxus baccata*, *Thymus perincius*, *Verbascum davidofii* and *Arthemisia eriantha* (P. ZHELEV, pers. comm.; cf. also section 11.3.3). Those MAP species that experts regard as being threatened in parts of Bulgaria or throughout the country are listed in Appendix D.1.

Cultivation

Cultivation of MAPs is more common in Bulgaria than in most countries of the Balkans, but it does not contribute more than 20-25 % to the total annual MAP harvest in the country (HARDALOVA 1997); however, the interest in cultivation is increasing. Today, about 30-40 MAP species are cultivated in Bulgaria. In the mid-1990s, the most important MAP species cultivated were: Peppermint (*Mentha* x *piperita*), about 1,000 ha; Common Fennel (*Foeniculum vulgare*), about 1,000-3,000 ha; *Glaucium flavum,* about 200-300 ha; *Datura innoxia*, about 150-200 ha; further cultivated species include Common Valerian (*Valeriana officinalis*), Marshmallow (*Althaea officinalis*) and Milk Thistle *Silybum marianum* (LANGE & MLADENOVA 1997; KUPKE et al. 2000). The cultivation of *Foeniculum vulgare* and *Glaucium flavum* has considerably declined during recent years, but no current data are available (P. ZHELEV, pers. comm.). The traditional cultivation of roses (e.g. *Rosa damascena*) to be used for the production of essential oil has still been maintained on an area of about 1,500 ha in 1994/1995; obviously, the area under rose cultivation has decreased considerably since. Today, most rose raw material (about 95 %) seems to be sourced from the wild (L. EVSTATIEVA, pers. comm.). Cultivated *Lavandula angustifolia* is also primarily used for essential oil production.

In 2001, the most important cultivated MAP species were reported to be *Mentha* spp. (8,000 tonnes/year), *Rosa canina* s.l. (about 300 tonnes/year), *Matricaria recutita* (about 120 tonnes/year) and *Valeriana officinalis* (100 tonnes/year; Tab. 7-8; P. ZHELEV, pers. comm.). Data are

somewhat contradictory, however. L. EVSTATIEVA estimates, that today the most important MAP species cultivated in Bulgaria are: *Mentha* x *piperita*, *Coriandrum sativum*, *Aesculus hippocastanum* and *Silybum marianum*. According to other sources, *Glaucium flavum, Matricaria recutita* and *Althaea officinalis* are only cultivated on a very small scale today, and *Datura innoxia* is not cultivated in Bulgaria at all (L. EVSTATIEVA, pers. comm.).

Research into the possibilities of cultivating further MAP species is carried out by the University of Agriculture in Plovdiv, the Botanical Institute of the Academy of Sciences in Sofia and the Institute of Roses, Essential Oils and MAPs in Kazanlyk. Tests to cultivate endangered species have been carried out using *Alchemilla mollis*, *Inula helenium*, *Ruta graveolens*, *Sideritis scardica*, *Sideritis syrica* (KUPKE et al. 2000), *Atropa belladonna*, *Rhodiola rosea*, *Solidago virgaurea*, *Leucojum aestivum* and *Convallaria majalis* (P. ZHELEV, pers. comm.). The MAP industry concentrates on the domestication and cultivation of these species, either because they are protected by law or because their natural resources are limited in Bulgaria (P. ZHELEV, pers. comm.). Some exotic species such as *Ortosiphon aristatus* and *Echinacea purpurea* will also be cultivated because they have some active agents lacking in the indigenous species (P. ZHELEV, pers. comm.).

Table 7-8: Estimated area of cultivation and annual harvest yield for eight important MAP species cultivated in Bulgaria.

Species cultivated	Area under cultivation [ha]	Current annual harvest [tonnes]	Cultivation mainly by:
Mentha spp.	4,000	8,000	national companies
Lavandula angustifolia	200	50	local co-operatives
Rosa canina s.l. (*1)	100	300	local co-operatives
Valeriana officinalis	100	90	Farmers
Matricaria recutita (*1)	100	120	local co-operatives
Melissa officinalis	50	70	Farmers
Salvia officinalis	20	10	local co-operatives
Origanum vulgare	10	4	Farmers

Data refer to 2001 and were provided by P. ZHELEV, August 2002.

(*1) Probably a considerably smaller area cultivated and less volumes sourced in these species (L. EVSTATIEVA, pers. comm.).

Cultivation is carried out by farmers, local agricultural co-operatives or national companies (Tab. 7-8; P. ZHELEV, pers. comm.). People hitherto active in wild-collection of MAPs may have the opportunity to participate in cultivation projects, if they are members of local agricultural co-operatives or if they have funds or credits to buy or lease arable land (P. ZHELEV, pers. comm.). However, not many collectors will receive the necessary funds because the majority of them does not have sufficient financial means.

At present, the efforts to replace wild-collection by cultivation of some species are not regarded as a potential danger to the income of collectors partly living from wild-harvesting MAPs in Bulgaria because the scale of cultivation is not supposed to increase considerably over the next years (P. ZHELEV, pers. comm.).

7.4 Croatia

MAP Species Harvested from the Wild

Medicinal and aromatic plants (MAPs) are wild-collected from almost the entire territory of Croatia, except for the big cities, their immediate surroundings, and agricultural land (D. MATIJEVIĆ, pers. comm.).

Table 7-9: Annual quota set up in 2001 by the Ministry of Environmental Protection and Physical Planning, Nature Protection Division (A. STRBENAC, pers. comm.).

	Species	Plant parts used	Annual quota (kg)
1	*Abies alba* Mill.	branch tips	5,000
2	*Aesculus hippocastanum* L.	fruits	6,100
3	*Betula pendula* Roth.	leaves	5,000
4	*Calluna vulgaris* /L./ Hull.	herb	(*1) 6,005
5	*Castanea sativa* Mill.	fruits	8,000
6	*Equisetum arvense* L.	herb	13,000
7	*Geranium robertianum* L.	herb	1,000
8	*Helichrysum italicum* /Roth./ Mill.	herb	1,000
		flowers	1,000
9	*Juniperus communis* L.	fruits	5,000
10	*Plantago lanceolata* L.	leaves	2,200
11	*Polygonum aviculare* L.	herb	1,500
12	*Rosa canina* L.	fruits	3,000
13	*Rubus fruticosus* L.	leaves	3,200
14	*Salix alba* L.	bark	1,320
15	*Salvia officinalis* L.	leaves	2,500
16	*Sambucus ebulus* L.	berries	1,000
17	*Sambucus nigra* L.	flowers	1,500
		fruits	1,000
18	*Solidago gigantea* Ait.	herb	2,000
19	*Tilia cordata* Mill.	flowers	1,000
20	*Tilia platyphyllos* Scop.	flowers	1,000
21	*Urtica dioica* L.	leaves	11,500
22	*Viscum album* L.	herb	3,500

'Plant parts used' slightly altered according to information provided by D. LANGE. (*1) This is most probably a misprint in the official statistics of the Ministry, because usually even-numbered quotas are set.

MAPs are harvested from the wild mainly in the following Croatian counties (Z. ŠATOVIĆ, pers. comm.):

(1) Koprivnica and Križevci County
(2) Krapina and Zagorje County
(3) Osijek and Baranja County
(4) Sibenik and Knin County
(5) Split and Dalmatia County
(6) Virovitica and Podravina County
(7) Zagreb County

It is difficult to obtain current data about actual and species-specific amounts of MAP collection in Croatia. Available, however, is a list of 22 MAP species for which the Ministry of Environmental Protection and Physical Planning issued collection permits and set quotas higher than 1,000 kg in 2001 (Tab. 7-9).

The most important MAP species collected are, amongst others, *Urtica dioica*, *Equisetum arvense*, *Castanea sativa*, *Juniperus communis* and *Betula pendula* (Tab. 7-9; compare also Appendix B.2).

Collectors

In Croatia, MAPs are mainly collected by private collectors, both female and male, older than 50 years of age. Most people collecting MAPs have already retired, are unemployed, or are peasants living on small-size family farms (Z. ŠATOVIĆ, pers. comm.). Romanies as an ethnic group are especially involved in the collection of medicinal and aromatic plants in Koprivnica and Križevci County and in Virovitica and Podravina County (Z. ŠATOVIĆ, pers. comm.).

No regional or national collectors' organisations are known to organise MAP collecting. However, some international wholesalers, who operate a network of trading points throughout the country, organise the collection of MAPs from the wild (Z. ŠATOVIĆ, pers. comm.). They usually contract collectors and meet them at the trading points to buy the raw material collected. In the purchase of wild-collected MAPs, quantities and qualities previously agreed upon are often not adhered to (KUPKE et al. 2000).

Control and Monitoring of MAP Wild-Harvesting

The wild-harvesting of medicinal and aromatic plants is controlled by the Ministry of Environmental Protection and Physical Planning. According to the 'Law on Nature Protection' (Article 36), an approval for collectors and companies harvesting plants from the wild that are not protected by the law has to be issued by the ministry (Law on Nature Protection, cf. section 11.3.4), if the collection is made for processing, commercial or trading purposes. Besides issuing these permits, the Ministry of Environmental Protection and Physical Planning sets quotas for the collection of particular MAP species. Quotas are set according to the state of the natural populations of the different species (the research is performed by the Faculty of Science and the Faculty of Pharmacy and Biotechnology, University of Zagreb) based on the Index Florae Croaticae, which is continuously updated (Z. ŠATOVIĆ, pers. comm.). In 2001, quotas were set for 87 plant species, and nine companies were given harvesting permits (cf. section 9.4); the total harvest yield in these species was about 108.9 tonnes in 2001 (Z. ŠATOVIĆ, pers. comm.). Wholesalers are obliged to inform the ministry about the amounts of particular wild medicinal plant species collected during the previous year (A. STRBENAC, pers. comm.). In addition, MAP wild-collection is reported to be systematically controlled in protected areas (namely in national parks and nature parks) by law enforcement officers (D. MATIJEVIĆ, pers. comm.).

Trade of MAPs harvested from the wild is not controlled in Croatia. To date, no monitoring system has been established (Z. ŠATOVIĆ, pers. comm.). A survey of the state of natural resources such as

MAPs and the establishment of a biological database and geographic information system are planned, but have not yet been accomplished (Z. ŠATOVIĆ, pers. comm.).

Nature Conservation and Protected Species

During the last few decades, a number of animal and plant species, including medicinal plants, have become endangered because of increasing stresses placed on natural resources and the environment. Besides overexploitation, habitat destruction or alteration such as drainage work, dam building and road constructions are a major concern (Z. ŠATOVIĆ, pers. comm.).

The Croatian 'Law on Nature Protection' (for details cf. section 11.3.4) protects 44 plant species (for a complete list cf. Appendix D.2), five of which are traditionally used as medicinal plants in folk medicine: *Anacamptis pyramidalis*, *Gentiana acaulis*, *Gentiana lutea* ssp. *symphyandra*, *Paeonia mascula* ssp. *mascula* and *Trollius europaeus* (Z. Šatović, pers. comm.). Most likely, overexploitation is not the only reason for the rarity of these species in the wild. However, the wild-stocks of *Gentiana lutea* and *Paeonia officinalis* have become threatened by overexploitation (Z. ŠATOVIĆ, pers. comm.).

The 'Red Data Book of Plant Taxa' of Croatia (SUGAR 1994) lists 401 endangered plant species, divided into six categories: extinct (2 species), possibly extinct (2 species), endangered (87 species), vulnerable (85 species), rare (214 species) and indeterminate (11 species). 17 of these species are considered to be endangered due to intensive collection for medicinal purposes, habitat loss or modification caused by activities such as drainage works, dam building, land clearing and others; among these endangered species are *Arnica montana*, *Digitalis grandiflora*, *Paeonia officinalis* and *Silybum marianum* (Z. ŠATOVIĆ, pers. comm.; for the list cf. Appendix D.2). The Ministry of Environmental Protection and Physical Planning is currently working on a Rule Book to regulate the protection of all plant species listed on the Croatian Red List (Z. ŠATOVIĆ, pers. comm.).

The Croatian Bank of Plant Genes (Faculty of Agriculture, University of Zagreb) provides ex-situ maintenance facilities. Its collection of medicinal and aromatic plants comprises about 900 accessions (180 MAP species) of Croatian and foreign origin (Z. ŠATOVIĆ, pers. comm.). The 'Fran Kušan' Pharmaceutical Botanical Garden (Faculty of Pharmacy and Biochemistry, University of Zagreb) was established in 1947 and is one of the few European botanical gardens specialising in growing medicinal plants. About 3,000 taxa are grown or conserved in Fran Kušan, intended for collecting and scientific research purposes (Z. ŠATOVIĆ, pers. comm.).

Cultivation

Among the wholesalers in Croatia, the general opinion obviously favours the cultivation of MAPs whenever it may be possible, depending on the particular species. Wholesalers seem to be worried about the future market potential for wild-harvested MAPs, because in Croatia both the quality and the degree of purity of the collected raw material are often low; therefore the raw material does not fetch high prices on the international market.

Cultivation would allow to better calculate the quantities of a certain MAP species that can be harvested in one season; annual domestic price fluctuations caused by changing environmental conditions could be avoided to some extent. Processing companies in Croatia and abroad often need a continuous supply of high-quality MAP raw material that – according to trading companies - can be only provided by means of cultivation. (RAMLJAK 1998, T. KURBANOVIĆ, I. RITONJA, N. NEMCEVIĆ, B. FILIPAJ, M. SUBAN and Z. ŠATOVIĆ, pers. comm.)

To date, however, medicinal and aromatic plants are only scarcely cultivated in Croatia. In 2001, MAPs were cultivated on an area of about 2,000 ha, which equals about 0.16 % of the total arable land (Z. ŠATOVIĆ, pers. comm.). 80 % of the MAPs cultivated are grown on family farms. Organic production of MAPs operates only on a very small scale (Z. ŠATOVIĆ, pers. comm.).

The most important species cultivated are (Z. ŠATOVIĆ, pers. comm.):
Camomile (*Matricaria recutita*) [flowers and whole plant], Peppermint (*Mentha* x *piperita*) [whole plant and leaves], lavender (*Lavandula angustifolia)* [flowers], sage (*Salvia officinalis*) [whole plant and leaves], Marshmallow (*Althaea officinalis*) [roots and leaves], Pot Marigold (*Calendula officinalis*) [flowers], Common Fennel (*Foeniculum vulgare*) [fruits], St John's-wort (*Hypericum perforatum*) [whole plant], Lemon Balm (*Melissa officinalis*) [whole plant and leaves] and thyme (*Thymus vulgaris*) [whole plant and leaves]. For most species, no exact data about areas cultivated and harvest yields are available. The dominant species is camomile, which is cultivated on about 800 family farms in Virovitičko-podravska, Osječko-baranjska and Koprivničko-križevačka counties. Most farmers have contracts with one of the three wholesalers 'Duhanprodukt d.d.' (Pitomača), 'Jan Spider d.o.o.' (Pitomača) and 'Agristar d.o.o.' (Osijek), who purchase almost the entire production (Z. ŠATOVIĆ, pers. comm.). The current annual yield is 0.6 tonnes/ha on average, totalling about 1,200 tonnes (Tab. 7-10). About 90 % of the annual camomile yield from cultivation is exported (Z. ŠATOVIĆ, pers. comm.).

MAP species both wild-collected and cultivated in Croatia include *Althaea officinalis*, *Calendula arvensis*, *Helichrysum italicum*, *Hypericum perforatum*, *Melissa officinalis*, *Origanum vulgare*, *Salvia officinalis*, and *Valeriana officinalis*, although most are cultivated on a very small scale (Z. ŠATOVIĆ, pers. comm.).

Table 7-10: Estimated area of cultivation and annual harvest yield for five of the most important MAP species cultivated in Croatia.

Species cultivated	Plant parts used	Current annual harvest [tonnes]
Matricaria recutita	flowers; whole plant	1,207
Mentha x *piperita*	whole plant; leaves	46
Salvia officinalis	whole plant; leaves	21
Althaea officinalis	roots and leaves	12
Foeniculum vulgare	fruits	11

Data refer to 2001 and were provided by Z. ŠATOVIĆ, September 2002.

The cultivation of lavender is limited to the island of Hvar, where it has traditionally been grown for centuries. The farmers are organised in the local agricultural co-operative Poljoprivredna zadruga 'Hvar', Island of Hvar (Z. ŠATOVIĆ, pers. comm.).

Data on the farm area currently used for the cultivation of MAPs in Croatia are somehow contradictory (Z. ŠATOVIĆ, pers. comm.). According to the '2001 Statistical Yearbook of Croatia', the total area under MAP cultivation was 2,633 ha in 2001 (Tab. 7-11). According to wholesalers, however, the area used for the cultivation of the most frequently cultivated MAP species, *Matricaria recutita*, alone summed up to over 3,000 ha in 2001 (T. KURBANOVIĆ, I. RITONJA, N. NEMCEVIĆ, B. FILIPAJ and Z. ŠATOVIĆ, pers. comm.). None of the other MAP species is cultivated on a total area of over 100 ha, but exact data are not available (Z. ŠATOVIĆ, pers. comm.). One may assume that the actual area under cultivation is around 3,000 ha for all MAP species together (Z. ŠATOVIĆ, pers. comm.).

Table 7-11: Total area under MAP cultivation between 1997 and 2001.

	Area under cultivation		
Year	**[ha] company-owned**	**[ha] farms family-owned**	**Total [ha]**
1997	481	1,834	2315.0
1998	293	1,315	1608.0
1999	277	1,699	1976.0
2000	452	1,745	2197.0
2001	787	1,846	2633.0
Average			**2145.8**

Data are taken from the Statistical Yearbook of the Republic of Croatia, 2001, Croatian Bureau of Statistics, CBS Zagreb (Z. ŠATOVIĆ, pers. comm.).

The majority of MAPs are cultivated on family farms (about 75 % on average); only about 25 % of the area cultivated is farmed by companies (Tab. 7-11). On family farms, MAP cultivation is usually a supplemental activity, and only few farms have specialised in MAP production (Z. ŠATOVIĆ, pers. comm.). Most family farms have contracts with trading companies (wholesalers); the trade is dominated by about 15 wholesalers (see section 9.4.; Z. ŠATOVIĆ, pers. comm.). The most prominent national companies (wholesalers) involved in cultivating MAPs are Duhanproduct d.d. (German Camomile, Peppermint), Jan Spider, d.o.o. (German Camomile, Peppermint, Common Fennel, Pot Marigold), Suban d.o.o. (Samobor) (German Camomile, Peppermint, Pot Marigold), and Agristar d.o.o. (German Camomile, Peppermint) (Z. ŠATOVIĆ, pers. comm.). MAP raw material sourced from cultivation in Croatia is mainly exported to Bosnia-Herzegovina, Yugoslavia, Slovenia, Austria, Germany, Sweden, Italy, FYR of Macedonia and USA (Z. ŠATOVIĆ, pers. comm.).

Looking to the future, wholesalers expressed a keen interest in cultivating the following MAP species, to become independent of imports (Z. ŠATOVIĆ, pers. comm.): Dalmatian Phyrethrum (*Tanacetum cinerariifolium*), Hyssop (*Hyssopus officinalis*), coriander (*Coriandrum sativum*), dill (*Anethum graveolens*), anise (*Pimpinella anisum*), Common Basil (*Ocimum basilicum*) and Italian Immortelle (*Helichrysum italicum*). Most of these species are already cultivated on a very small scale.

Because of its insecticidal effect, *Tanacetum cinerariifolium* was already cultivated in Croatia about 100 years ago. At the beginning of the 20th century, *Tanacetum cinerariifolium* was cultivated on more than 2,000 ha in Dalmatia, with an annual yield of over 900 tonnes. The cultivation of this species was reduced after the introduction of cheaper, synthetic insecticides, and eventually ceased completely. Together with the increasing consumer awareness of ecologically sound products, a new market for natural insecticides has developed, and some phyrethrum-based products are on the market again (e.g. 'Bioaromatica', Zagreb; Z. ŠATOVIĆ, pers. comm.).

Helichrysum italicum is especially interesting for the Croatian essential oil producers (such as 'Ireks aroma d.o.o.', Zagreb), because the quality of *Helichrysum italicum* collected from the wild is poor (Z. ŠATOVIĆ, pers. comm.)

To date, a shift from wild-collection to cultivation is not favoured by the population in Croatia, especially with regard to species that are harvested from the wild in considerable quantities. Nevertheless, it is supposed that the local population have the opportunity to participate in the cultivation of MAPs (Z. ŠATOVIĆ, pers. comm.). The background to these opportunities is the fact that many people living partly from the wild-collection of MAPs often include older people who live on small family farms in less developed rural areas (such as Gorski kotar, Lika and Dalmatinska zagora); a third of the 530,000 family farms are 1 ha in size or below, and 50 % are between 1 and 5 ha. On farms of such size the commercial production of crops is not profitable. For these farms, the cultivation of MAP species such as sage or marshmallow could be profitable if the purchase and price of the harvested MAPs were guaranteed (GRGIĆ et al. 1999).

Research

There are a number of research institutes in Croatia that are active in investigations and programmes on MAPs and crop plants. The most important institutes are: the Faculty of Agriculture and the Agricultural Institute in Osijek, the Institute for Breeding and Production of Field Crops in Zagreb, the Institute for the Mediterranean Crops and Amelioration in Split, the Agricultural Institute in Porec and the Institute for Mediterranean Plants in Dubrovnik (Croatian Bank of Plant Genes 1995). In addition, research projects are also carried out by the 'Faculty of Pharmacy and Biochemistry' in Zagreb, which has an extensive pharmaceutical botanical garden ('Fran Kušan') with about 3,000 different taxa; this institute is also engaged in education on the use of MAPs and publishes 'Delectus seminum' and 'Informationes Botanicae' (Z. ŠATOVIĆ, pers. comm.).

Projects of the Faculty of Pharmacy and Biochemistry, University of Zagreb include (Z. ŠATOVIĆ, pers. comm.):

- Research on medicinal plants in Croatia (by ZDENKA KALOĐERA)
- Pharmacobotanical and chemotaxonomical investigation of medicinal plants (by ŽELJAN MALEŠ)
- Medicinal plants – biologically active compounds and QSAR (by MARICA MEDIĆ-ŠARIĆ)

Research projects on MAPs are carried out partly in co-operation with Slovenian institutes and include, among others (Z. ŠATOVIĆ, pers. comm.):

- The genetic variability of medicinal and aromatic plants
- The production of medicinal and aromatic plants
- Phylogenetic studies on basil (*Ocimum* spp.; Biotechnical Faculty of Ljubljana)
- Genetic structure of Croatian sage (*Salvia* spp.) populations
- Genetic variability of *Origanum vulgare* populations (Agricultural Institute of Slovenia, Ljubljana)

Medicinal herb producers and processors in Croatia have affiliated to the 'Croatian Chamber of Economy'; the aims of this chamber are (1) to encourage co-operation, (2) to strengthen the links between research institutes, private companies and governmental agencies, and (3) to work on regulations and legislation affecting the production, processing, quality control and trade of medicinal plants (Z. ŠATOVIĆ, pers. comm.).

7.5 Romania

Medicinal and Aromatic Plant (MAP) Species Harvested from the Wild

A large number of MAP species, spice herbs and fruits are collected from the wild in Romania. Currently, the most important of over 300 species collected are *Vaccinium myrtillus* (fruits, ca. 2,500 tonnes in 2001) and *Rubus idaeus* (fruits, ca. 1,500 tonnes in 2001), which are harvested in large quantities (Tab. 7-12; cf. also Appendix B.3). However, data about the species-specific quantities harvested considerably differ depending on the source of data.

Table 7-12: Twelve MAP species harvested in high quantities from the wild in Romania.

MAP species	Main region of collection	Quantities collected in 2001 [tonnes]	Plant parts used
Vaccinium myrtillus	mountain regions	2,500.0	fruits
Rubus idaeus	mountain regions	1,500.0	fruits
Tilia cordata	whole country	85.0	flowers
*Tilia argentea (*1)*	whole country	75.0	flowers
Betula pendula	Transylvania and Muntenia	75.0	leaves
Crataegus monogyna	Transylvania	58.0	leaves
Arnica montana	Transylvania	28.0	flowers
Petasites hybridus	Transylvania	20.0	roots
Artemisia absinthium	whole country	16.0	herb
Achillea millefolium	whole country	12.8	flowers
Arctium lappa	whole country	10.5	roots
Allium ursinum	Transylvania	9.0	leaves

Data refer to 2001 and are provided by the Ministry of Water and Environmental Protection (Gh. COLDEA, pers. comm.).

(*1) *Tilia argentea*: synonym to *Tilia tomentosa*; *Tilia argentea* is officially allowed only to be used for herbal teas not being sold for medicinal purposes; maybe these data include other *Tilia* species as well (D. LANGE, pers. comm.)

Other MAP species, not mentioned in the list provided by the Ministry of Water and Environmental Protection but evidently collected in larger quantities in Romania include (quantities are very rough estimates): *Betula pendula* (leaves; ca. 200 tonnes), *Aesculus hippocastanum* (seeds; about 150 tonnes/year), and *Sambucus* sp. (flowers and fruits; about 190 tonnes/year) (A. BLUMER, pers. comm.; for details see Appendix B.3).

MURARIU (2002) estimates that about 11,280 tonnes of dried MAP raw material were collected from the wild in 2001. This estimation seems relatively high, compared to Romania's export statistics (cf. LANGE in section 8 of this study); taken both levels together, only about 10 % of the raw material collected in Romania would enter the international market and 90 % would either be traded locally or processed by national companies.

Collectors

Individual collectors, local and national companies collect MAPs from the wild. Individual collecting is mostly done by poorer people, women with children between 12 and 16 years, and minority groups (A. BLUMER and Gh. COLDEA, pers. comm.). Families in rural areas often collect MAPs for their private use to last the year (A. BLUMER, pers. comm.). Most collectors are seasonal workers gaining additional income by the collection of MAPs during the spring and summer months. Only a few small communities, e.g. in Muntii Apuseni National Park, live entirely from collecting MAPs from the wild (A. BLUMER and B. MICHLER, pers. comm.). These groups may suffer from a further shift from wild-collection to cultivation, which, however, is unlikely to happen in the nearer future (A. BLUMER, pers. comm.).

Since the early 1990s, a number of private trading companies have sprung up, but the former state-owned company, PLAFAR, is still the largest and most important Romanian trade company for MAPs (for details cf. section 9.5). Some of the private companies do not contract their own collectors, but buy MAP raw material from intermediate traders or small companies (A. BLUMER, pers. comm.).

Control and Monitoring of MAP Wild-Harvesting

Wild-collection of MAPs in Romania is controlled by the federal government. Inspectors of the Environmental Protection Agency (EPA), which represents the Ministry of Water and Environmental Protection, regularly control collectors in the field and at storage points. However, quantities collected are not always easy to control (A. BLUMER, pers. comm.). The controls are based on a monitoring and quota system that results in the issue of Environmental Permits (EP). For this purpose, an annual evaluation and impact study is carried out by research institutes accredited by the Ministry of Water and Environmental Protection (according to the **Order No. 647 / 26.07.2001** of the Ministry of Water and Environmental Protection; cf. also section 11.3.5). The results of the study have to be approved by the Scientific Commission of the Romanian Academy and the EPAs of the counties. Theoretically, the study should contain the maximum allowable quantity to be collected in a specific area. Species-specific, regional harvest quantities, which must not be exceeded, should be derived from the study. Depending on these quantities and on the declarations of collectors or companies about where they

would like to collect, EPs are issued that allow controlled legal access to MAP collection from the wild (A. BLUMER and Gh. COLDEA, pers. comm.).

In 1999, Environmental Permits were issued for 2,300 tonnes of medicinal and aromatic plants. The largest quantities were approved for Cluj (1,200 tonnes), Vaslui (360 tonnes), and Mures (225 tonnes) counties. Total collection volumes allowed by EPs issued fell to 970 tonnes in 2000 and 620 tonnes in 2001 (A. BLUMER, pers. comm.; information according to the report 'Stare Mediului 2001', Ministry of Water and Environmental Protection).

Trade is also controlled by a taxation system (cf. section 9.5). The regional EPAs are responsible for monitoring the MAP collecting and trading activities in their counties (Gh. COLDEA, pers. comm.). This mechanism is reported to be weak (A. BLUMER, pers. comm.). At national level, an effective monitoring system is lacking. The regional EPAs issue EPs but data are not collected and centralised at state level. Only the export of MAPs can be monitored on national level based on the requested and issued EPs. For this purpose, the Ministry of Water and Environmental Protection has built up an extensive database of all species, quantities and companies involved in international trade (A. BLUMER, pers. comm.).

Nature Conservation and Protected Species

Some MAP species are protected by Romanian legislation and not allowed to be harvested from the wild. The Nature Conservancy Council of the Romanian Academy determined the status of 'protected species' including the MAP species *Adonis vernalis*, *Convallaria majalis* and *Ruscus aculeatus* (Gh. COLDEA, pers. comm.). **Law No. 462/2001** (Art. 26a) states that the collection of plant species listed in the Red Lists is prohibited in and outside protected areas. However, exact legal definitions and listings are not yet available because the Romanian National Red Lists (three different Red Lists exist) have not been legally adopted (A. BLUMER, pers. comm.).

Romanian experts regard *Acorus calamus*, *Angelica archangelica*, *Arctostaphylos uva-ursi*, *Leucojum vernum*, *Gentiana lutea* and *Ruscus aculeatus* as endangered in Romania (Gh. COLDEA, and A. BLUMER, pers. comm.). In addition, Dr. OVIDIU BOJOR states that *Arnica montana*, *Centaurium erythrea*, *Gentiana asclepiadea* and *Gentiana punctata* are endangered in Romania. *Gentiana asclepiadea* seems to be collected as compensation for *G. lutea*, which is protected; *Gentiana asclepiadea* itself is expected to disappear from the wild in about 10 years. *Gentiana punctata* is very rare and especially growing in the northern part of Romania (O. BOJOR and A. BLUMER, pers. comm.). Endangered MAP species wild-collected in Romania include *Arnica montana* [flowers and roots], *Primula officinalis*, *Tussilago farfara* [flowers], *Atropa belladonna*, *Allium ursinum*, *Althaea officinalis* [leaves], *Adonis vernalis*, *Galium verum*, *Lycopodium clavatum* [whole plants] and *Gentiana lutea*, *Helleborus purpurascens*, *Angelica archangelica* [roots, bulbs or tubers] (MURARIU 2002).

C. DRAGULESCU (pers. comm.) however, considers *Centaurium erythrea*, *Gentiana asclepiadea*, *Primula officinalis*, *Tussilago farfara*, *Althaea officinalis*, *Galium verum*, *Lycopodium clavatum* and *Helleborus purpurascens* not as endangered in Romania.

According to specialists interviewed, there is an increasing pressure on wild MAP species. Which is worse, there is no clear understanding about the current wild-stock and ecological habitat conditions of MAP species in Romania, and no study on this topic is planned in the near future (A. BLUMER, pers. comm.).

Cultivation

The cultivation of MAPs has a long tradition in Romania, and a range of about 50 different species (52, according to MURARIU 2002) is cultivated (Tab. 7-13).

The most important MAP species cultivated are *Hippophae rhamnoides* (650 ha) and *Aesculus hippocastanum* (120 ha). Yields from the cultivation of *Calendula officinalis*, *Salvia officinalis* predominantly enter the international market. Other species cultivated and exported from Romania include *Leucojum vernum*, *Malva sylvestris*, *Allium schoenoprasum*, *Plantago* spp., *Trifolium pratense*, *Anemone nemorosa*, *Allium ursinum*, *Scilla bifolia*, *Hepatica nobilis*, *Croccus heuffelianus* and *Arum maculatum* (A. BLUMER, pers. comm.; some of these may be exclusively used in homeopathy (LANGE, pers. comm.)). *Mentha* x *piperita*, *Ranunculus polyanthemos*, *Carum carvi* and *Glycyrrhiza echinata* (A. BLUMER, pers. comm.) are cultivated mainly for the domestic market.

Table 7-13: Estimated area of cultivation and annual harvest yield for ten important MAP species cultivated in Romania.

Species cultivated	Area under cultivation [ha]	Current annual harvest [tonnes]	Parts harvested
Hippophae rhamnoides	650	230.0	fruits
Aesculus hippocastanum	120	120.0	flowers and fruits
Ribes nigrum	15	18.0	leaves and fruits
Atropa belladonna	12	22.0	roots
Echinacea purpurea	10	20.0	roots
Mentha x piperita	10	24.0	leaves
Salvia officinalis	9	6.5	leaves
Cynara scolymus	8	20.0	leaves
Calendula officinalis	7	4.0	flowers
Digitalis purpurea	5	7.5	leaves

Data refer to 2001 and have been provided by GH. COLDEA, August 2002.

Today, MAPs are cultivated on an area of about 25,000 ha. The area under cultivation during recent years showed a sharp decline from 1996 to 1998 (from about 36,000 to 16,000 ha) but has been gradually increasing again since (Fig. 7-1; MURARIU 2002).

Local agricultural co-operatives dominate MAP cultivation in Romania; however, also individual farmers and national companies occasionally cultivate MAPs. Private MAP tillage accounts for well over 50 % of the total area used for MAP cultivation (Fig. 7-1), but its share appears to be decreasing.

Information about the share of organic farming is very contradictory; while some state that about 65 % of the medicinal and aromatic plants harvested from cultivation were grown according to the principles of organic farming (I. ILARIE and Gh. COLDEA, pers. comm.), others suppose, from the data obtained, that only few if any organically grown MAPs exist in Romania (A. BLUMER and C. DRAGULESCU, pers. comm.).

During recent years, MAP cultivation in Romania has suffered considerably from economic uncertainties. Today, about 60 % of the areas originally cultivated with MAPs are no longer used. The area under cultivation has also fallen, since 'PLAFAR' has begun to lose its dominant position on the Romanian market (A. BLUMER, pers. comm.). Despite this development, some efforts are being made to domesticate and cultivate further MAP species in the future. These species include *Valeriana officinalis*, *Oenothera biennis*, *Scopolia carniolica* and *Arnica montana* (Gh. COLDEA, pers. comm.). Breeding is carried out in 25 MAP species, including *Digitalis lanata*, *Foeniculum officinale*, *Hyssopus officinalis*, *Coriandrum sativum*, *Lavandula angustifolia*, *Matricaria recutita* and *Papaver somniferum* (MURARIU 2002). Certified local land-races exist in 31 species (*Pimpinella anisum*, *Silybum marianum*, *Satureja hortensis*, *Digitalis purpurea*, *Foeniculum vulgare* and others) (MURARIU 2002).

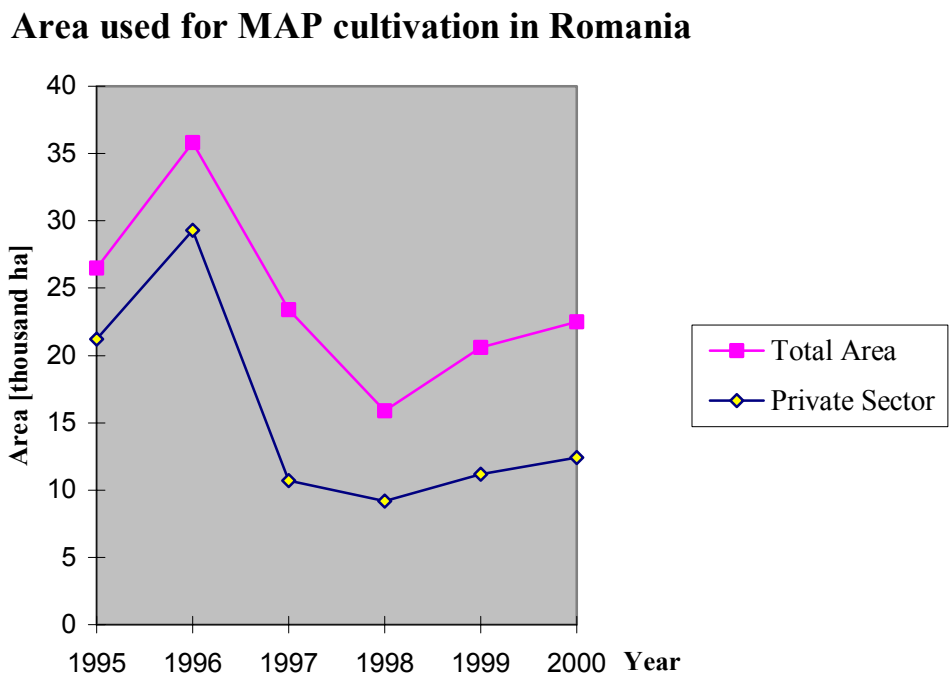

Figure 7-1: Total area and private sector share of MAP cultivation in Romania (1995-2000). Modified from: MURARIU 2002.

Research

Scientific research into natural sciences has a long and outstanding tradition in Romania and involves a large number of universities, organisations and institutions (NSAP 1996). In addition, there is a research station of MAPs in Fundulea (MURARIU 2002). A 'National Research Programme in Ecology' addresses – together with local applied research programmes – different aspects of nature conservation and biodiversity (NSAP 1996). Unfortunately, the research is largely uncoordinated, because there is no central system for organising and disseminating information. In addition, some initiatives are concerned with medium and long-term ex-situ conservation in botanical gardens, collections and gene-banks (NSAP 1996). Amongst these are the Suceava Genebank (170 species in 246 samples) and the Agricultural University Iasi (about 1,200 species in 1,270 samples) (MURARIU 2002). A 'Romanian catalogue of medicinal, aromatic and other plants' ('Catalog national de plante medicinale, aromatice si alte plante') has been compiled (MURARIU 2002).

8 The Role of East and Southeast Europe in the Medicinal and Aromatic Plant Trade - with Special Focus on Albania, Bosnia-Herzegovina, Bulgaria, Croatia and Romania

by Dagmar Lange

East and Southeast European countries are a rich and often also a cheap source of medicinal and aromatic plants, for both domestic use and for export (LANGE 1998a). The use of many species in folk medicine, the long tradition of herb production, the majority of which is obtained from the countries' wild native sources, the importance of herbs as export products in the former Eastern Bloc, and the expanded trade system are characteristics of many, if not of most, countries in this region (BERNÁTH 1996, LANGE & MLADENOVA 1997, LANGE 1998a, 2001, 2002). Moreover, some of the countries play a significant role in the international and European medicinal and aromatic plants market (LANGE 1998a, 2002).

In this paper, the results of the trade analysis published in LANGE (1998a, 2002) are updated, extended and focused on East and Southeast European countries, above all on Albania, Bosnia-Herzegovina, Bulgaria, Croatia, and Romania.

An analysis of international trade figures of botanicals gives an overview of the main features of the trade in this commodity, in particular on the significance of this market, the countries involved and the trade streams (see also LANGE, 1997, 1998a, 2002). For this purpose, the international trade figures for the commodity group *pharmaceutical plants*, SITC.3 292.4[1], compiled in the UNCTAD COMTRADE database by the United Nations Statistics Division, New York, and selected years of the foreign trade statistics of Albania and Bulgaria have been evaluated. Principally, the global trade figures presented are based on the export and import statistics of 162 countries for the period 1991 to 2000, in which 110 countries reported an import and/or export of *pharmaceutical plants*. However, export and import figures of some of the East and Southeast European countries are not available for the whole period due to (1) the political changes that happened during the 1990s, (2) the warfare in the former Yugoslavia during the 1990s, and (3) because these countries first began to report their trade statistics according to the SITC or the HS[1] during the 1990s. In these cases, at least incomplete figures of the East and Southeast European trade in *pharmaceutical plants* can be presented. As Bosnia-Herzegovina has not reported its trade figures to the United Nations Statistics Division until now, hence the data presented are based on information given by some of the partner countries and are therefore maybe patchy.

[1] Standard International Trade Classification Revision 3. Commodity group 292.4 equates to HS (Harmonized Commodity Description and Coding System) 1,211 *plants and parts of plants (including seeds and fruits), of a kind used primarily in perfumery, in pharmacy or for insecticidal, fungicidal or similar purposes, fresh or dried, whether or not cut, crushed or powdered*.

8.1 East and Southeast Europe's Place in Global Trade

In the 1990s, the reported annual global imports of medicinal and aromatic plant material, based on the commodity group *pharmaceutical plants*, amounted on average to 400,000 tonnes valued at US$ 1,224 million[2] (LANGE, in press). The international trade is dominated by only few countries: about 80 % of world-wide imports and exports are traded by only twelve countries, with the temperate Asian and European countries dominating (Tab. 8-1). Whereas Japan and the Republic of Korea are the main consumers of *pharmaceutical plants*, and China and India are the world's leading producing nations, Hong Kong[3], the USA and Germany stand out as important trade centres for botanicals, showing both high import and high export quantities[4] (LANGE, in press).

No East and Southeast European country is among the top twelve countries of import, and in the 1990s on average only 3 % of the global import volume and 2 % of the value was destined for East and Southeast Europe. However, one Southeast European country, Bulgaria, is listed in 9th position of the world's top twelve export countries of *pharmaceutical plants* (Tab. 8-1).

Table 8-1: The world's top twelve countries of import and export of *pharmaceutical plants*, according to average annual quantities and values for the period 1991-2000.

Country of import	Quantity [tonnes]	Value [US$]	Country of export	Quantity [tonnes]	Value [US$]
Hong Kong	67,000	291,200,000	China	147,000	281,800,000
Japan	51,350	136,000,000	Hong Kong	63,150	228,800,000
USA	49,600	135,500,000	India	33,900	56,650,000
Germany	45,350	110,200,000	Germany	15,100	70,050,000
Rep. Korea	32,250	52,300,000	USA	13,500	115,500,000
France	21,350	52,000,000	Mexico	13,000	11,250,000
China	13,650	41,600,000	Egypt	11,750	13,850,000
Italy	11,700	42,850,000	Chile	11,600	28,200,000
Pakistan	11,050	11,150,000	Bulgaria	10,050	14,500,000
Spain	9,100	27,650,000	Singapore	9,600	56,600,000
United Kingdom	7,650	27,000,000	Morocco	8,000	13,300,000
Singapore	6,300	50,600,000	Pakistan	7,800	4,950,000
Total	**326,300**	**978,150,000**	**Total**	**344,400**	**893,400,000**

Figures based on commodity group *pharmaceutical plants* (SITC.3: 292.4 = HS 1211). The quantities are given in tonnes [tonnes]. The European countries are underlaid in grey. – Source: UNCTAD COMTRADE database, United Nations Statistics Division, New York; Foreign Trade Statistics of Albania and Bulgaria.

Albania follows in 13th position, Poland in 16th, Turkey in 19th and Hungary in 20th position of the 110 countries reporting imports and/or exports of *pharmaceutical plants*. In this period, not less than 8.5 % of the global export quantities were exported from East and Southeast Europe. With regard to the

[2] These figures do not include the quantities purchased and used within a country; in some countries, such as China or India, these quantities are very high.

[3] Hong Kong = China HK SAR

[4] In the case of Hong Kong, the exports are mostly re-exports.

value, the shares are somewhat lower: the value of the East and Southeast European export commodities comprised about 6.5 % of the global export value. These figures reveal clearly that none of the East and Southeast European countries are primarily consumer countries like Japan or Korea, but highlight them as important suppliers of raw material to the world's medicinal and aromatic plants market.

8.2 East and Southeast Europe's Place in Europe's Pharmaceutical Plant Trade

Europe as a whole, as well as many individual European countries, is an important actor in the international botanical's trade (LANGE 1998a, 2001, 2002), as (1) Europe is responsible for one third of annual global imports, and one fifth of annual global exports, (2) five European countries, all of them EU Member States, are among the twelve leading countries of import world-wide, (3) the list of the top twelve countries of export includes two European countries, and (4) Germany is one of the three world trade centres for this commodity. Within the European trade in *pharmaceutical plants*, East and Southeast European countries lead in exports but not in imports (see also LANGE 1998a, 2001, 2002). This is described best by the following three facts:

1. European exports are dominated by East and Southeast European countries (Fig. 8-1). They exported on average 36,360 tonnes annually during the 1990s, which is almost 50 % of the average European export (75,900 tonnes). However, the East and Southeast European share of Europe's average export value of US$ 248.7 million is only about 26 %, reflecting the low prices achieved for the plant material exported (see below).

2. In the 1990s, the imports of East and Southeast Europe amounted on average to 12,050 tonnes valued at US$ 24.3 million. Compared to the average European import of 127,230 tonnes valued at US$ 365 million, their share is below 10 %. Most European imports, almost 88 % of the average European import, were destined for EU countries, above all for Germany (Tab. 8-1; LANGE 1998a, 2001, 2002).

3. Europe is clearly divided into source and consumer countries, characterised by either positive or negative net imports (Fig. 8-2; LANGE 1998a, 2002). In the 1990s, only few East and Southeast European countries were found on the consumer-country side, showing generally very low positive average net imports (Fig. 8-2). The highest were the Russian Federation, with 3,030 tonnes, and Slovakia, with 2,640 tonnes, which are very low compared to Germany, with 30,240 tonnes, and France, with 14,400 tonnes average net imports (Fig. 8-2). Furthermore, Slovenia, Greece, Lithuania, Latvia and Estonia show positive net imports ranging from 625 tonnes to 10 tonnes. The majority of the East and Southeast European countries are found on the source-country side (Fig. 8-2). Those countries with the highest negative average net import are Bulgaria (-9,800 tonnes), Albania (-7,540 tonnes), Poland (-4,240 tonnes), Turkey (-3,620 tonnes), and Hungary (-2,690 tonnes), being the most important European source countries for the commodity *pharmaceutical plants*. Further, Yugoslavia, the Czech Republic, Romania, Croatia, FYR of Macedonia, the Republic of Moldova and Belarus show net imports ranging from -1,400 tonnes to

–70 tonnes. Accordingly, the major actors in this trade belong to the former Eastern Bloc. In all, the average net import of all East and Southeast European countries adds up to –24,325 tonnes.

In general, the East and Southeast European countries are a cheap source of medicinal and aromatic plant material. On export, the average price per tonne was US$ 1,790 during the 1990s, which is only half of the average European export price of US$ 3,280. Moreover, this figure is less than 40 % of the German (US$ 4,640/tonne) and French (US$ 4,990/tonne) average export prices, and only 1/5 of the Swiss (US$ 9,200/tonne) and the UK average export prices (US$ 10,120/tonne), which are the highest within Europe. However, there are some differences amongst the East and Southeast European countries. During the 1990s, the value of the plant material exported from Slovenia amounted at 4,090 US$ per tonne, from Croatia to 2,900 US$/tonne, and from Poland to 2,230 US$ per tonne. On export, Turkey still achieved 2,210 US$/tonne and Romania 1,740 US$/tonne. Prices noticeably below the East-Southeast-European-average-price were paid e.g. for the commodities exported from Albania (1,570 US$/tonne), Hungary (1,540 US$/tonne), Bulgaria (1,440 US$/tonne), Yugoslavia (1,090 US$/tonne) and finally the Czech Republic (842 US$/tonne).

Most exports from the East and Southeast European countries are destined to Germany (BERNÁTH 1996, LANGE & MLADENOVA 1997, LANGE 1998a). In 1996, Germany imported over 20,000 tonnes of *pharmaceutical plants* from these countries, which represented 64 % of the total exports of East and Southeast Europe (Fig. 8-3). Germany's imports from East and Southeast European countries were six times higher than those of France or Italy, and ten times higher than those of Spain (LANGE 1998a). Above all, Germany exports *pharmaceutical plants* to central, western and southwestern European countries (Fig. 8-4), thus acting as a link between the Eastern and Southeastern European market and the rest of Europe.

8.3 Trade Figures for East and Southeast Europe

Overview

Export: In the 1990s, East and Southeast European countries reported exports of an average 36,360 tonnes of the commodity *pharmaceutical plants* (Tab. 8-2) at a value of US$ 65.1 million. Within the region, the leading country of export is by far Bulgaria (10,050 tonnes, US$ 14.5 million), followed by Albania (7,650 tonnes, US$ 12 million), Poland (6,330 tonnes, US$ 14.1 million), Turkey (3,970 tonnes, US$ 8.8 million), and Hungary (3,890 tonnes, US$ 6 million). The exports of these five leading countries of export made up 88 % of the total export of all East and Southeast European countries.

Export trends: As trade figures at the beginning of the period 1991-2000 are unavailable for some of the countries, and because of changes in trade at that time (BERNÁTH 1996, LANGE & MLADENOVA 1997, LANGE 1998a, 2001), it is very difficult to assess the growth of the quantities exported from East and Southeast Europe during the 1990s. However, the export quantities increased from 40,450 tonnes to 48,490 tonnes in 2000, with a peak of 56,170 tonnes in 1998 (Tab. 8-3). The latter accurately reflects the global situation: between 1996 and 1998, the market in *pharmaceutical plants*

broke down, in particular in the USA and in temperate Asia (LANGE, in press), with considerable impacts on the source countries for botanicals. However, the market in botanicals has already started to recover (Tab. 8-3; LANGE, in print). The Bulgarian exports of *pharmaceutical plants* decreased between 1991 and 1993 from 10,040 tonnes to 5,140 tonnes, then increased by three times to 15,450 tonnes in 1998. In 1999 the reported export fell to 8,340 tonnes and recovered in 2000 to 10,890 tonnes. The Albanian exports increased from 1995 to 1999 by 12 % from 7,860 tonnes to 9,010 tonnes, and dropped in 2000 to 7,520 tonnes. Over the same period, Poland's exports increased continuously from 4,260 tonnes in 1993 to 11,200 tonnes in 2000. Hungary, before 1990 for a long time the most important supplier of medicinal and aromatic plant material to the European market, showed no increase; its exports rose and fell between somewhat below 4,000 tonnes and about 6,200 tonnes. Finally, Turkey's exports fluctuated around 4,000 tonnes during the 1990s.

Table 8-2: Average annual figures for the reported export and import figures of *pharmaceutical plants* of East and Southeast European countries in the 1990s*.

Country of export	Quantity [tonnes]	Value [US$]	Country of import	Quantity [tonnes]	Value [US$]
Bulgaria	10,050	14,508,000	Russian Federation	3,340	4,866,500
Albania	7,650	12,006,500	Slovakia	3,160	1,633,500
Poland	6,330	14,140,000	Poland	2,090	5,187,500
Turkey	3,970	8,801,500	Czech Republic	1,530	5,098,000
Hungary	3,890	6,009,500	Greece	1,410	1,816,000
Czech Republic	2,760	2,322,000	Hungary	1,200	2,838,000
Yugoslavia	1,670	1,819,000	Slovenia	1,000	2,439,000
Croatia	1,260	3,650,500	Croatia	490	1,314,000
Romania	1,080	1,873,000	Turkey	350	644,500
Greece	930	1,935,500	Yugoslavia	270	536,500
FYR of Macedonia	660	1,113,000	Bulgaria	260	548,500
Slovakia	520	1,240,000	FYR of Macedonia	200	259,500
Slovenia	380	1,542,500	Belarus	190	958,500
Russian Federation	310	842,500	Lithuania	150	485,000
Belarus	270	1,307,500	Bosnia-Herzegovina	113	607,500
Bosnia-Herzegovina	150	313,000	Albania	110	51,500
Republic Moldova	130	231,000	Latvia	49	186,000
Lithuania	23	142,500	Romania	45	187,000
Latvia	18	65,000	Estonia	17	105,500
Estonia	7	82,500	Republic Moldova	14	82,000
Total: E + SE-Europe	**36,360**	**65,101,500**	**Total: E + SE-Europe**	**12,000**	**24,294,000**
Total: Europe	**75,900**	**248,729,000**	**Total: Europe**	**127,170**	**364,873,000**

Figures based on commodity group *pharmaceutical plants* (SITC.3: 292.4 = HS 1211). – Source: UNCTAD COMTRADE database, United Nations Statistics Division, New York.

* The figures are for the period 1991-2000, if available, otherwise for the reported years.

Imports: In contrast to the exports, the imports of medicinal and aromatic plant material to East and Southeast European countries are in general low. In the 1990s, only 12,050 tonnes of the commodity *pharmaceutical plants* of a value of US$ 24.3 million were reported to be imported to the whole region, which is less than one third compared to the 36,360 tonnes and US$ 65.1 million plant material

exported (Tab. 8-2). Whereas many countries, such as Croatia, Bulgaria, Bosnia-Herzegovina, Albania, Romania, Lithuania, and Turkey, showed nearly no imports or at least less than 500 tonnes during the 1990s, Slovenia, Hungary, Greece and the Czech Republic had annual imports ranging from 1,000 tonnes to about 1,500 tonnes. Only Poland, Slovakia, and the Russian Federation reported considerable annual imports (Tab. 8-2) during the 1990s: the Russian Federation's imports of *pharmaceutical plants* were highest (3,340 tonnes, US$ 4.9 million), followed by Slovakia (3,160 tonnes, US$ 1.6 million) and Poland (2,090 tonnes, US$ 5.2 million (Tab. 8-2).

Table 8-3: Export quantities in [tonnes] of *pharmaceutical plants* of the five leading East and Southeast European countries of export in the period 1991-2000.

Country of export	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Bulgaria	10,040	6,440	5,140	9,050	10,600	10,790	13,810	15,450	8,340	10,890
Albania	n.a.	n.a.	n.a.	n.a.	7,860	6,870	6,300	8,210	9,010	7,520
Poland	n.a.	n.a.	4,260	4,810	5,390	7,400	8,920	10,240	11,090	11,200
Turkey	4,980	3,210	3,340	3,230	4,160	3,700	4,280	4,480	5,440	2,930
Hungary	n.a.	7,290	5,430	3,950	5,360	4,080	n.a.	6,170	n.a.	2,770
Total: E + SE-Europe	**(16,280)**	**(23,010)**	**(24,300)**	**(27,260)**	**40,450**	**38,400**	**(42,760)**	**56,170**	**46,510**	**48,490**

Figures based on commodity group *pharmaceutical plants* (SITC.3: 292.4 = HS 1211). The figures in brackets are not complete. – Source: UNCTAD COMTRADE database, United Nations Statistics Division, New York.

n.a. = not available.

8.3.1 Albania

Data availability: Albania started to report their foreign trade statistics according to the Harmonized Commodity Description and Coding System (version 1996) in 1996. Export figures for Albania are available for the period 1996-2000, those of 1995 (only total figures), 1996 and 1997 are from the Foreign Trade Statistics of Albania, those of 1998-2000 are from the UNCTAD COMTRADE database. In the following, average trade data apply, in the case of exports for the period (1995-) 1996-2000 and in the case of imports for 1997-2000.

Exports: Albania reported the export of an average 7,650 tonnes of *pharmaceutical plants* at a value of US$ 12 million (Tab. 8-2). The exports were destined for 26 countries with the dominance of EU countries, which imported almost 80 % of the commodity. The remaining 20 % were exported to other East and Southeast European countries above all to Greece, followed by FYR of Macedonia and Turkey and to non-European countries such as the USA and, much less important, Japan (Tab. 8-4). Within the EU, Germany is the foremost importer of botanicals from Albania; it imported on average 2,770 tonnes. The second and third most important purchasers are Italy, importing on average 1,690 tonnes, and France, with average imports of 780 tonnes. The prices on export are quite low as one tonne fetched on average only US$ 1,570. The Albanian exports increased from 1995 to 1999 by 12 % from 7,960 tonnes to 9,010 tonnes, and fell in 2000 to 7,520 tonnes (Tabs. 8-3, 8-4)

Imports: Albania reported the import of only an average 167 tonnes of *pharmaceutical plants* annually to a value of US$ 39,000. In all, the country imported this commodity from eight different, but only European, countries. Most imports came from FYR of Macedonia, Yugoslavia and Bulgaria.

Table 8-4: Albania: Export quantities in [tonnes] of *pharmaceutical plants* to the most important destinations in the period 1995-2000.

Country of import	1995	1996	1997	1998	1999	2000	Average
Germany	n.a.	2,930	2,010	2,960	3,170	2,770	2,770
Italy	n.a.	1,630	1,290	1,950	2,210	1,380	1,690
France	n.a.	630	650	820	880	950	780
USA	n.a.	530	790	270	560	860	600
Greece	n.a.	440	630	870	1,020	450	680
TFYR Macedonia	n.a.	290	410	n.a.	340	440	300
Turkey	n.a.	47	140	300	320	320	230
Yugoslavia	n.a.	18	n.a.	570	n.a.	11	120
Total	**7,860**	**6,800**	**6,300**	**8,210**	**9,010**	**7,520**	**7,580**
Total: EU	n.a.	5,670	4,610	6,720	7,430	5,660	6,020

Figures based on commodity group *pharmaceutical plants* (SITC.3: 292.4 = HS 1211). – Source: UNCTAD COMTRADE database, United Nations Statistics Division, New York. – n.a. = not available.

8.3.2 Bosnia-Herzegovina

Data availability: There are no foreign trade data of Bosnia-Herzegovina as a reporting country included in the UNCTAD COMTRADE database. However, as many trade partners of Bosnia-Herzegovina report their foreign trade statistics to the United Nations Statistics Division, there are trade data available, although it is not known how complete they are.

Exports: According to the trade data reported by trade partners of Bosnia-Herzegovina, this country traded mainly with countries belonging to the former Yugoslavia (Tabs. 8-5, 8-6). The exports of *pharmaceutical plants* were destined mainly for Slovenia and Croatia, followed by Yugoslavia and Germany (Tab. 8-5). Table 8-5 shows a considerable increase in exports from 52 tonnes in 1997 to 293 tonnes in 2000.

Table 8-5: Bosnia-Herzegovina: Export quantities in [tonnes] of *pharmaceutical plants* reported by trade partners in the period 1996-2000

Country of import	1996	1997	1998	1999	2000
Slovenia	0	35	85	83	97
Croatia	0	0	37	40	91
Yugoslavia	0	9	3	79	55
Germany	0	0	17	13	27
Austria	0	8	0	8	8
Italy	0	0	7	20	7
United Kingdom	0	0	0	0	4
Hungary	6	0	0	5	2
Sweden	0	0	0	1	1
USA	0	0	0	0	1
Spain	0	0	0	1	0
France	0	0	1	0	0
Total	**6**	**52**	**150**	**250**	**293**

Figures based on commodity group *pharmaceutical plants* (SITC.3: 292.4 = HS 1211). – Source: UNCTAD COMTRADE database, United Nations Statistics Division, New York (partner countries).

Imports: Bosnia-Herzegovina bought botanicals above all from Yugoslavia (Tab. 8-6), followed by Croatia and Slovenia. Further imports came from FYR of Macedonia, Austria and Italy. According to the trade data reported by trade partners of Bosnia-Herzegovina, this country showed a negative net import in the period 1996-2000.

Table 8-6: Bosnia-Herzegovina: Import quantities in [tonnes] of *pharmaceutical plants* reported by trade partners in the period 1996-2000

Country of export	1996	1997	1998	1999	2000
Yugoslavia	0	10	13	113	148
Croatia	35	0	42	45	26
Slovenia	0	23	13	14	17
FYR of Macedonia	0	0	20	13	9
Austria	0	0	1	1	7
Italy	0	0	0	7	3
Hungary	0	0	1	0	3
Germany	0	0	0	0	2
Czech Republic	1	0	0	0	0
Denmark	0	0	1	0	0
Total	**36**	**33**	**91**	**193**	**215**

Figures based on commodity group *pharmaceutical plants* (SITC.3: 292.4 = HS 1211). – Source: UNCTAD COMTRADE database, United Nations Statistics Division, New York (partner countries).

8.3.3 Bulgaria

Data availability: Bulgaria started to report its foreign trade statistics according to the Harmonized Commodity Description and Coding System (version 1996) in 1996. Since 1996, Bulgaria's trade data have been included in the UNCTAD COMTRADE database. Export and import figures for Bulgaria for the years before 1996 were taken from the Bulgarian Foreign Trade Statistics. In the following paragraphs, average trade data apply, if not otherwise stated, in the case of exports to the period 1991-2000 and in the case of imports to 1992-2000.

Exports: Bulgaria reported the export of on average 10,050 tonnes of *pharmaceutical plants* to a value of US$ 14.5 million (Tabs. 8-2, 8-7). The exports were destined for 53 countries with the dominance of EU countries, which imported almost 88 % of the commodity. The remaining 12 % were exported to other East and Southeast European countries above all to Greece, followed by FYR of Macedonia and Hungary. Only few non-European countries imported botanicals from Bulgaria, of which the USA was the most important, purchasing on average 335 tonnes per year (Tab. 8-7). Germany is by far the most important destination country of Bulgarian herbs, importing 6,480 tonnes - equal to an average of two thirds of the country's annual exports (Tab. 8-7). Further, only Spain and Italy import with some 700 tonnes considerable amounts of Bulgarian *pharmaceutical plants*. The prices on export are quite low as one tonne achieved on average only US$ 1,440. The Bulgarian exports of *pharmaceutical plants* decreased between 1991 and 1993 from 10,040 tonnes to 5,140 tonnes, then increased threefold to 15,450 tonnes in 1998. In 1999, reflecting the global market situation of botanicals, the reported export fell to 8,340 tonnes and recovered in 2000 to 10,890 tonnes.

Imports: Bulgaria reported the import of on average only 260 tonnes of *pharmaceutical plants* annually, to a value of US$ 548,350. In all, the country imported this commodity from 41 different, but mainly other East and Southeast European, countries. Most imports came from Turkey (on average 98 tonnes), FYR of Macedonia (on average 72 tonnes), Ukraine (on average 20 tonnes) and Germany (on average 12 tonnes).

8.3.4 Croatia

Data availability: Croatia started to report its foreign trade according to the Harmonized Commodity Description and Coding System (version 1988) in 1992. Since 1997, the statistics have been based on the HS version 1996. Export and import figures have been available from the UNCTAD COMTRADE database since 1992. Accordingly, average trade data apply to the period 1992-2000.

Exports: Croatia reported the export of on average 1,260 tonnes of *pharmaceutical plants* to the value of US$ 3.65 million (Tabs. 8-2, 8-8). The exports were destined for 32 countries with the dominance of European countries, which imported 77 % of the commodity. The remaining 23 % were exported mainly to the USA (on average 125 tonnes). Within Europe, 65 % of all exports went to EU countries (Tab. 8-8) and 28 % to other East and Southeast European countries, mostly to Slovenia (average imports 170 tonnes). Germany, with average imports of 490 tonnes, and Italy, with 220 tonnes, are the most important customers of Croatian herbs (Tab. 8-8). Furthermore, France imported on average 130 tonnes. The prices on export noticeably exceeded the East-Southeast-European-average-price of US$ 1,790, as one tonne achieved on average US$ 2,900. For political reasons, the Croatian exports of *pharmaceutical plants* decreased between 1992 and 1997 from 1,810 tonnes to 1,080 tonnes, but increased since 1998 progressively to 1,560 tonnes in 2000 (Tab. 8-8).

Imports: Croatia reported the import of on average 490 tonnes of *pharmaceutical plants* to the value of US$ 1.3 million (Tab. 8-8). In all, the country imported this commodity from 29 different, but mainly European (87 %) countries and in particular those of East and Southeast Europe (66 %). A quarter of the imports came from FYR of Macedonia (on average 125 tonnes). About 90 tonnes were imported from Germany, about 40 tonnes each from Bosnia-Herzegovina and Albania, 32 tonnes from Bulgaria, and some 20 tonnes from Slovenia, Yugoslavia, and Hungary. Imports from non-European countries came from, for example, Sudan (on average 10 tonnes) and the USA (on average 6 tonnes).

8.3.5 Romania

Data availability: Romania started to report its foreign trade according to the Harmonized Commodity Description and Coding System (version 1988) in 1989. Since 1997, the statistics have been based on the HS version 1996. Export and import figures have been available from the UNCTAD COMTRADE database since 1991. Accordingly, average trade data apply to the period 1992-2000. However, the reported trade data seem to be very incomplete, in particular for the beginning of the 1990s, making a meaningful analysis almost impossible.

Exports: Romania reported the export of on average 1,080 tonnes of *pharmaceutical plants* to the value of US$ 1.87 million (Tabs. 8-2, 8-9). The exports were destined for 21 countries with the

dominance of European countries, which imported 84 % of the commodity. The remaining 16 % apply primarily to one reported export of 1,630 tonnes to Israel in 1997. About 73 % of the exports were destined for EU countries, for the most part to Germany (52 %), which imported on average 560 tonnes annually (Tab. 8-9). Further, France imported on average 170 tonnes per year. On export, Romanian herbs achieved a price of 1,740 US$/tonne. Table 8-9 shows that there was a slight export growth until 1997, to 2,630 tonnes, but that exports fell below 900 tonnes in 1999 and 2000.

Imports: Romania reported the import of on average only 45 tonnes of *pharmaceutical plants* to the value of US$ 187,000 (Tab. 8-2). In all, the country imported this commodity from 29 different countries, about 40 % both from EU countries and from other East and Southeast European countries. Most herbs were imported from Germany (on average 13 tonnes), followed by the Republic of Moldova (on average 8 tonnes) and France and Poland (on average 4 tonnes).

Table 8-7: Bulgaria: Export quantities in [tonnes] of *pharmaceutical plants* to the most important destinations in the period 1991-2000.

Country of import	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	Average
Germany	8,590	4,330	3,130	6,140	6,980	7,230	6,910	9,300	5,250	6,910	6,480
Spain	150	440	320	490	470	730	1,370	1,450	870	1,120	740
Italy	220	420	430	750	620	640	1,790	1,400	470	540	730
France	310	300	360	270	360	670	960	530	460	520	470
USA	130	160	270	300	530	350	540	570	290	190	340
Switzerland/Liechtenstein	140	220	250	230	270	210	380	630	140	200	270
Greece	91	52	30	280	400	110	170	97	88	140	150
FYR of Macedonia	n.a.	2	36	24	n.a.	170	350	n.a.	150	290	100
Hungary	n.a.	0	47	50	210	170	220	n.a.	160	77	94
Austria	110	230	91	150	69	63	120	0	31	64	92
Poland	n.a.	4	10	210	480	57	45	0	17	6	83
Total	**10,040**	**6,440**	**5,140**	**9,050**	**10,600**	**10,790**	**13,810**	**15,450**	**8,340**	**10,890**	**10,050**
Total: EU	9,740	5,930	4,430	8,210	9,020	9,700	11,610	12,770	7,230	9,440	8,810

Figures based on commodity group *pharmaceutical plants* (SITC.3: 292.4 = HS 1211). – Source: UNCTAD COMTRADE database, United Nations Statistics Division, New York, and the Foreign Trade Statistics of Bulgaria. - n.a. = not available.

Table 8-8: Croatia: Export quantities in [tonnes] of *pharmaceutical plants* to the most important destinations in the period 1992-2000.

Country of import	1992	1993	1994	1995	1996	1997	1998	1999	2000	Average
Germany	370	360	n.a.	500	510	560	840	800	950	490
Italy	220	210	n.a.	350	270	250	200	350	410	220
Slovenia	600	430	n.a.	120	90	87	83	61	72	160
France	100	77	n.a.	83	45	3	17	2	1	40
USA	300	330	n.a.	140	230	85	5	32	34	130
Total	**1,810**	**1,650**	n.a.	**1,300**	**1,280**	**1,080**	**1,260**	**1,370**	**1,650**	**1,260**
Total: EU	730	680	n.a.	950	840	840	1,220	1,320	1,530	820

Figures based on commodity group *pharmaceutical plants* (SITC.3: 292.4 = HS 1211). – Source: UNCTAD COMTRADE database, United Nations Statistics Division, New York. - n.a. = not available.

Table 8-9: Romania: Export quantities in [tonnes] of *pharmaceutical plants* to the most important destinations in the period 1991-2000.											
Country of import	**1991**	**1992**	**1993**	**1994**	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**	**Average**
Germany	41	91	450	870	930	700	470	880	500	650	560
France	0	16	250	250	230	270	280	220	120	78	170
Hungary	48	57	17	23	2	28	100	90	67	65	50
Switzerland/Liechtenstein	0	7	28	49	81	120	110	16	8	5	42
Italy	0	20	81	57	25	0	21	8	8	14	23
	89	**250**	**980**	**1,360**	**1,310**	**1,140**	**2,630**	**1,380**	**780**	**860**	**1,080**
Total: EU	41	130	900	1,190	1,190	990	780	1,250	660	780	790
Figures based on commodity group *pharmaceutical plants* (SITC.3: 292.4 = HS 1211). – Source: UNCTAD COMTRADE database, United Nations Statistics Division, New York.											

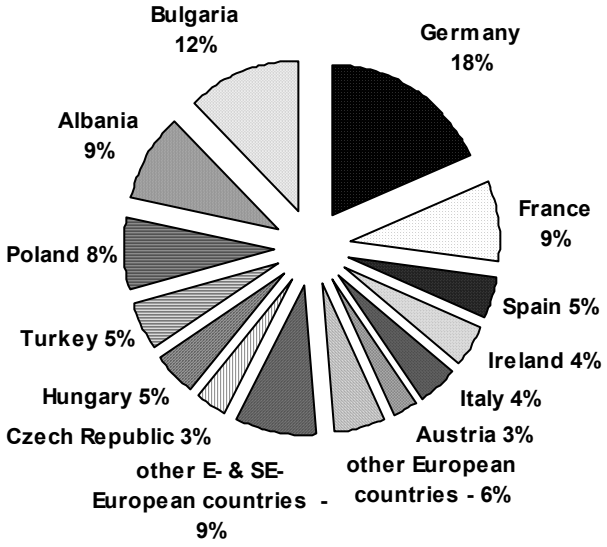

Figure 8-1: Export of *pharmaceutical plants* from European countries for the period 1991-2000. Total average export quantity 1991-2000: 75,800 tonnes. – Source: UNCTAD COMTRADE database (United Nations Statistics Division, New York).

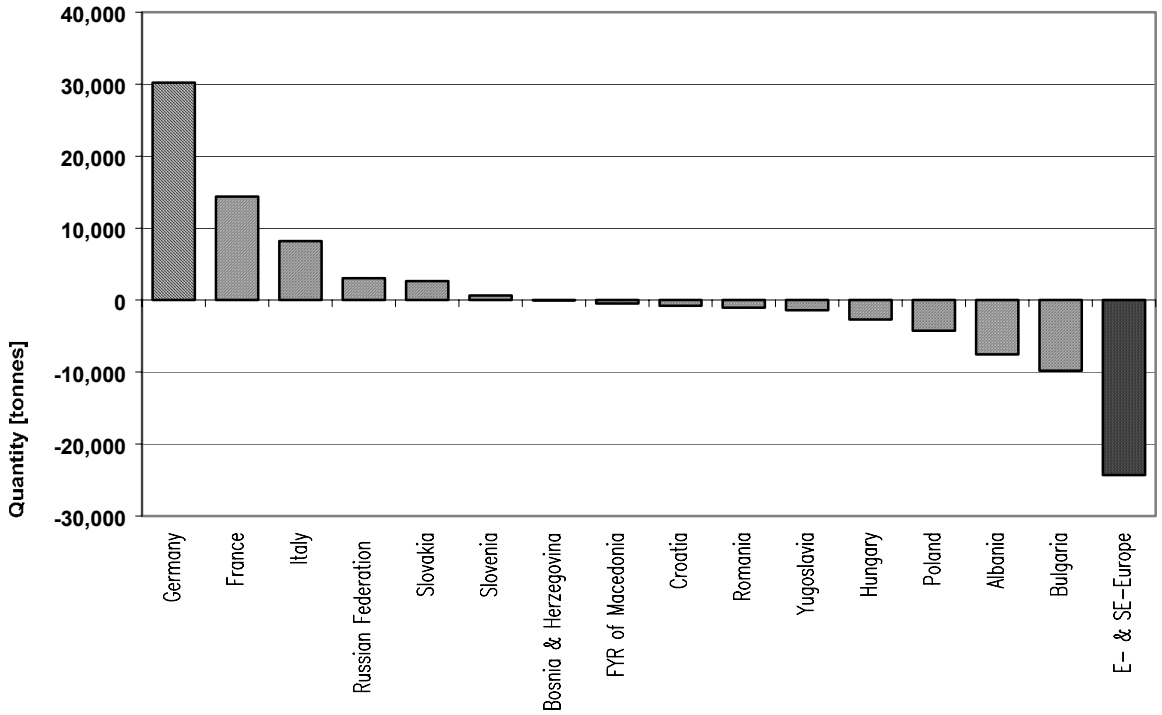

Figure 8-2: Average net imports of *pharmaceutical plants* of selected European countries for the period 1991-2000. The quantities are given in tonnes. – Source: UNCTAD COMTRADE database (United Nations Statistics Division, New York).

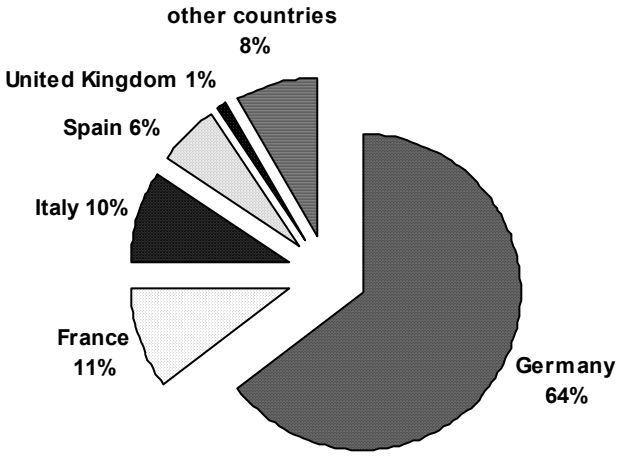

Figure 8-3: Destination countries of the exports of *pharmaceutical plants* from East and Southeast European countries in 1996. Total export 32,000 tonnes. – Sources: LANGE (1998a); UNCTAD COMTRADE database (United Nations Statistics Division, New York).

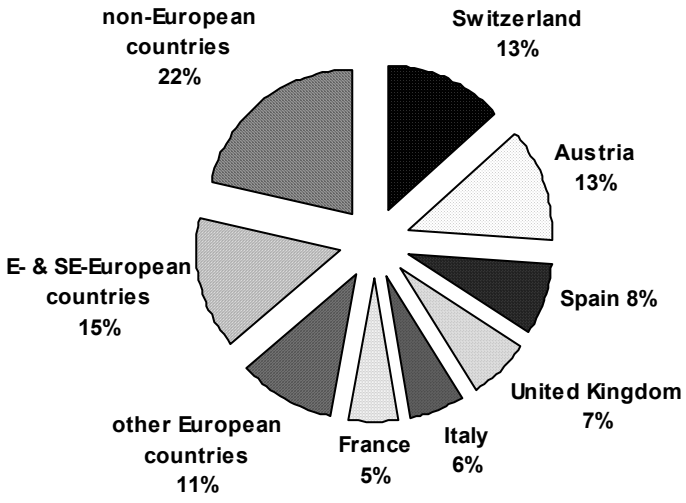

Figure 8-4: Destination countries of the German exports of pharmaceutical plants in 1996. Total export 15,300 tonnes. – Sources: LANGE (1998a); UNCTAD COMTRADE database (United Nations Statistics Division, New York).

9 Current Trade in Medicinal and Aromatic Plants

9.1 Albania

Exports and Imports

Albania is one of the most important European exporting countries for medicinal and aromatic plants (MAPs) and one of the cheapest MAP sources for importing countries (see D. LANGE, section 8 of this study). In 2001, Albania sold about 10,000 tonnes of MAP dried raw material on the international market (Z. DEDEJ, pers. comm.). To date, prime destinations for Albanian MAP exports are Germany, France, Italy, Greece, and USA (see D. LANGE, section 8 of this study). As Albanian export statistics (and most destination countries' import statistics) list only MAP commodity groups (HS 1211 'other pharmaceutical plants'; HS 0904-0910 'spices'; HS 33 'essential oils and resinoids'; HS 13 'lac, gums, resins, plant saps and extracts'), it is difficult to assign export volumes to single species (LANGE & MLADENOVA 1997; LANGE 1998a). The volume of Albanian MAP imports is comparatively modest (see D. LANGE, section 8 of this study, and LANGE 2002).

Trade Structure

Today, about 95 % of the MAPs collected from the wild are exported; only 5 % are consumed privately or locally (VASO 1997, LANGE 1998a). Some sources even estimate that nearly 100 % of the MAP material collected enters international trade (Z. DEDEJ, pers. comm.). In recent years, the traditional domestic use of MAPs in Albanian folk medicine has declined and has been partly replaced by modern western medicine (KUPKE et al. 2000).

The large companies (wholesalers) usually hand an annual list with species and amounts requested to the intermediate traders from whom they purchase the MAP raw material. The intermediate traders try to buy the required quantities from collectors or local traders and re-sell the MAP raw material to wholesalers, who export the MAPs either as dried raw material or, in some cases, semi- or fully processed. According to current observations, the market tries to avoid the intermediate trade (cf. section 12.1, and FREMUTH et al. 1999); the large trading companies and local harvesters have built up direct communication links and companies try to buy the material directly from the collectors (Z. DEDEJ, pers. comm.). Direct export of MAP raw material by local or intermediate traders is rare. The most important MAP species exported from Albania are *Origanum vulgare*, *Thymus* spp., *Salvia officinalis*, *Salvia fruticosa,* and *Satureja montana* (Tab. 9-1). Orchid species used for the production of salep are also exported in considerable amounts. These species are listed in CITES (Appendix. II) and require permits to be traded legally. Most likely, *Orchis morio* (Tab. 9-1) is only one of 10-20 different species exported from Albania. As collectors and traders do often not differentiate between the species, one may suppose that a large number of other species are traded under the name '*Orchis morio'*, including genera like *Barlia*, *Anacamptis, Himantoglossum, Ophrys* and others (D. LANGE, pers. comm.).

Table 9-1: The 15 most collected and traded MAP species in Albania.

Species	Estimated amounts of MAPs exported from AL in 2001 [tonnes]	Plant parts used
Salvia officinalis (*1)	1,000	leaves
Origanum vulgare	800	herb
Satureja montana	500	herb
Thymus vulgaris	440	herb
Hypericum perforatum	424	herb
Rubus idaeus	380	leaves/fruits
Melissa officinalis	350	leaves
Juniperus oxycedrus	285	berries
Crataegus monogyna	240	leaves/berries
Rosa canina	200	fruits
Trifolium spp.	152	flowers
Primula veris	105	flowers
Orchis morio (*2)	100	tubers
Juniperus communis	85	berries
Sideritis raeseri	75	herb

Annual quantities refer to 2001. Estimations of Z. DEDEJ, Director of the Nature Resources Management and Biodiversity Directorate, Ministry of Environment, Tirana.

(*1): *Salvia officinalis*: export data almost certainly include *S. fruticosa* (D. LANGE, pers. comm.)

(*2): '*Orchis morio*' is most probably a collective denomination for all orchid species exported for the production of salep. Not only *Orchis* spp. may be included but also other genera (D. LANGE, pers. comm.)

Trading Companies

Private companies trading and exporting MAPs and other NTFPs have mushroomed since 1995, some 3-4 years after the end of the state-controlled planned economy in 1991 (KUPKE et al. 2000). There is no longer any direct state control or involvement in this business (SEED HQ 2000). Ten large companies trade MAPs in Albania. The four major export companies may have controlled about 65 % of Albania's MAP exports in 1999 (SEED HQ 2000); according to other sources, these 4 companies control an estimated 90 % of Albania's MAP exports (VASO 1998). The largest of these companies is the former state monopoly agency 'Alb Ducros' (Durrës), which has been bought by the US-company McCormick. The larger export companies (for a list cf. SEED HQ 2000) procure their raw materials from collectors or from 50-70 small regional dealers/intermediate traders (SEED HQ 2000), who usually contract local collectors to provide them with the MAP species and quantities required. Today, the most important companies trading in MAPs are 'EUROCOL', 'Alb-Ducros' and 'Filipi Ltd.'; the number of collectors providing MAP raw material to these companies is estimated at 35,000 (Z. DEDEJ, pers. comm.).

Most companies trade MAP dried raw material. Only 'Elba Shehu' (Elbasan) has specialised in trading (semi-) processed MAP products (essential oils, semi-finished extractions and finished products). Two other companies also sell essential oils ('Albaflor', Tirana and 'Cupi Shpk.', Lezha).

Herbal teas are traded by 'Gjoni Shpk.' (Mamuras), 'Alb Ducros' (Durrës), 'Cupi Shpk.' (Lezha) and 'Peaid' (Tirana) (SEED HQ 2000). The company 'Profarma' seems to be the only Albanian company active in pharmaceuticals trade; 'Profarma' uses only very limited amounts of regional MAP raw material (mainly thyme (*Thymus* spp.); KUPKE et al. 2000).

9.2 Bosnia-Herzegovina

The 'Bosnian War' brought BiH political independence, but the price was high, not only because of its disastrous social impact but also in terms of economics (see also section 5.2), because both infrastructure and industry were totally ruined. However the first plants have gradually grown through the layers of post-war ashes. The infrastructure is being rebuilt, and it is expected that industry will become the basis of the country's economic development; the production of healthy food is one of the aims of social and economic development in BiH (REC 2000b). In 1999, the privatisation process started in BiH, beginning with the privatisation of small and medium-sized companies. However there is still very little privatisation at state level, and BiH seems to be a negative example of 'an ethnic model of privatisation' (REC 2000b).

Following the independence of the states formerly united under the Socialist Republic of Yugoslavia many traditional medicinal and aromatic plant (MAP) trade routes from BiH, mainly to Croatia and to the Federal Republic of Yugoslavia, have been cut off. Whereas companies in FBiH seem to have started to re-adjust to the changed situation, companies in the Republika Srpska appear to be inextricably linked to their Serbian counterparts (SEED HQ 2000).

Exports and Imports

Export volumes of MAPs from BiH have decreased dramatically during the war and have not yet recovered appreciably during the post-war period. Today, the annual export volume does exceed 100 tonnes for any of the 14 most collected MAP species (cf. section 7.2). However, no detailed information about the actual volumes is available (SEED HQ 2000; see D. LANGE, section 8 of this study), because there is still no system to control material collected in BiH (D. PEĆANAC, pers. comm.). For MAP imports to BiH see D. LANGE in section 8 of this study.

Trade Structure

The market in Bosnia-Herzegovina is still largely unorganised. A small clue might be found in the current estimates of MAP species collected in Bosnia-Herzegovina (section 7.2; Tab. 7-3). Examining the distribution of MAP plant raw material entering the local, national and international markets, it becomes evident that the majority is exported – at a rate of almost 100 % for some species (Tab. 9-2; D. PEĆANAC, pers. comm.).

Only a very small percentage of the MAP raw material is traded at local markets. This may be due to the still prevailing private collection and use of MAPs by most of the rural population in BiH. The domestic market seems to serve predominantly city markets.

The black market has unknown but remarkable dimensions, and many MAPs are obviously traded illegally to other European countries (mainly to the Federal Republic of Yugoslavia, Croatia and Italy) across the borders, which are barely kept under surveillance (Anonymous, pers. comm.). Furthermore, individual collectors have started to collect MAP raw material for direct, illegal sales to international companies, thus causing serious conflicts of interest (DUNJIC & DUERBECK, 2002).

Considerable quantities of endangered species like *Gentiana lutea* appear to be shipped in this illegal trade (obviously mainly to Italy). Certain local companies offer a price of 5-7 KM per kilogramme dried Yellow Gentian roots to collectors (Anonymous, pers. comm.).

Table 9-2: Trade in the 17 most important MAP species harvested from the wild in Bosnia-Herzegovina. Estimated percentage of local, domestic and international trade.

MAP species	Local market	National market	International market
Achillea millefolium	-	20 %	80 %
Betula pendula	-	-	100 %
Crataegus monogyna / Crataegus nigra	-	-	100 %
Helichrysum arenarium	-	10 %	90 %
Juniperus spp.	-	-	100 %
Plantago lanceolata	-	-	100 %
Rhamnus frangula	-	-	100 %
Salvia officinalis	5 %	10 %	85 %
Sambucus nigra	-	5 %	95 %
Satureja montana	-	10 %	90 %
Teucrium montanum	10 %	20 %	70 %
Thymus serpyllum	-	5 %	95 %
Tilia tomentosa	5 %	10 %	85 %
Verbascum thapsus (*1)	-	5 %	95 %
Vitex agnus-castus	-	-	100 %

Data provided by D. PEĆANAC.
(*1): *Verbascum thapsus*: this may include other species of the same genera (D. LANGE, pers. comm.)

Official market prices vary considerably due to international demand and current availability, which depend on climatic factors and on the quantities and prices offered by other exporting countries on the market (Tab. 9-3).

The prices paid to collectors vary on a short-term basis. There is no official price regulation; collectors are often unsatisfied with what they are paid and have the feeling that they are being cheated by the trading companies (D. PEĆANAC, pers. comm.).

The chain of custody in BiH is nearly uniform. National trading companies receive requests from international companies or intermediate traders. The organisation of collectors and the determination of collection periods and amounts are largely based on these international demands (D. PEĆANAC, pers. comm.). Almost all large companies (Klas, Smrcak, Jolovic, Ljekobilje, Elmar) stated that they could organise the collection of far greater amounts if the international demand were higher

(D. PEĆANAC, pers. comm.). The trading companies, however, are reluctant to give away information about which international or national companies they work for, maybe because they fear that the results of an international study could have a negative effect on their co-operation with international partners or might detect the large quantities of MAP raw material illegally exported from BiH (Anonymous, pers. comm.). In addition, trading companies may fear potential direct marketing and subsequent competitive disadvantages if they reveal the names of their partners (D. LANGE, pers. comm.).

Table 9-3: Current market prices of ten of the most frequently collected MAP species in Bosnia and Herzegovina.

MAP species	**Current market price [KM /kg dried material]**
Achillea millefolium	5.50
Helichrysum italicum	12.60
Juniperus spp.	1.80
Plantago lanceolata	4.50
Salvia officinalis	5.60
Satureja montana	7.50
Teucrium montanum	7.50
Thymus serpyllum	5.50
Tilia tomentosa	7.50
Vitex agnus-castus	5.00

Price information provided by D. PEĆANAC, based on information obtained from various trading companies (ROING, Ljekobilje, Smrcak and Jolovic d.o.o.). Current exchange rate: 1 KM ≈ 0.5 EURO.

Trading Companies

The structure of the BiH herbal industry is still characterised by the dominance of the former state-owned companies KLAS and UPI Sarajevo. Once the economy in Bosnia-Herzegovina had been opened up, a number of private companies developed. Among these is 'Pharmamed', a medium sized company from Travnik, which is the BiH-agent for the large German wholesaler 'Martin Bauer' (SEED HQ 2000). Most of the other private herbal companies concentrate around Sarajevo (FBiH), Trebinje and Banjaluka (RS) and also trade other NTFPs.

Some companies, such as GM (Banjaluka, RS) or ROING[1] (Ljubuski, FBiH), are involved in the cultivation of MAPs in collectives or on private plantations (D. PEĆANAC, pers. comm.). While most companies purchase and trade/export dried MAP raw material, there are a small number of enterprises that partly or fully process the MAP raw material before trading it. This processing may include the production of essential oils ('Boletus' and 'Planta' in Sarajevo, FBIH; 'Andjelic' and 'Lekobilje' in Trebinje, RS), of extractions ('Vekstra' in Mostar, FBiH; 'Pharmamed' in Travnik, FBiH) or of finished products such as medicaments (UPI Sarajevo, 'Planta' and 'Faveda', Sarajevo, FBiH).

[1] ROING has been originally founded to develop a company constructing machines ('-ING' stands for engineering); however, they also started with agricultural production besides constructing machines for processing (D. PEĆANAC, pers. comm.).

The packing of herbal tea is carried out by the Sarajevo-based companies 'Boletus', 'Planta' and 'Faveda' and by the Trebinje-based companies 'Elmar' and 'Lekobilje' (SEED HQ 2000). About 80 different pharmaceutical or cosmetic products and 65 medicinal or herbal teas are produced in the country (KUPKE et al. 2000).

The opinions and estimations of the country's leading trading companies concerning current trends and possible future market and resource developments in medicinal and aromatic plant trade in BiH differ to some extent. Most companies agree that there is great potential in BiH if they succeed in regaining old customers or opening up additional markets for their products (ROING, Smrcak; Jolovic, Klas, Ljekobilje, Elmar) (D. PEĆANAC, pers. comm.). 'Klas' emphasised that they were not satisfied with the MAP raw material purchased in 2002; the quality was poor due to the excessive rainfall. The trading company 'Agroplod' expressed the opinion that the potential to sell natural bio-resources from BiH are decreasing, especially with regard to *Salvia officinalis* and *Helichrysum italicum*[1], which have both been important export commodities for BiH (D. PEĆANAC, pers. comm.).

All Herzegovinan companies (Andjelic, Elmar, Ljekobilje, Agroplod, ROING) regard *Vitex agnus-castus* a particularly promising species for future export. Companies from Eastern Bosnia (Smrcak, Jolovic) tend to see special potential in *Allium ursinum*, *Sambucus nigra*, *Rosa canina* (fructus) and *Tilia tomentosa* to meet the increasing demand and thereby achieve higher export rates (D. PEĆANAC, pers. comm.).

Meanwhile, a legal framework has been provided in both RS and FBiH ('Forestry Law'/'Forest Law'; cf. section 11.3.2), which, however, still awaits effective implementation in order to use collectors' fees according to the provision of the laws. An evaluation of the income generating effects has been planned during the 'Sellers/Buyers Meeting' in November 2002 (D. PEĆANAC, pers. comm.).

9.3 Bulgaria

Exports and Imports

In terms of volume, the annual harvest of medicinal and aromatic plants (MAPs) in Bulgaria amounts to about 14,000 – 17,000 tonnes, 60-70 % of which are exported (MLADENOVA 1996; LANGE & MLADENOVA 1997). With an annual export volume of over 10,000 tons, Bulgaria lies in 9th position on the list of the world's largest suppliers of MAPs (see D. LANGE in section 8 of this study). Annual exports may fluctuate by more than 1,000 tonnes and the official export (Bulgarian Foreign Trade Statistics) and import data (German Foreign Trade Statistics) differ considerably (LANGE & MLADENOVA 1997). A small but partly unknown portion of the Bulgarian exports is 'transit-trade': plants or parts of plants like rose hips have originally been harvested in other countries such as FYR of Macedonia or Russia, and are traded via Bulgaria (LANGE & MLADENOVA 1997).

Little information is available on botanical drug imports into Bulgaria (LANGE & MLADENOVA 1997). Bulgaria imports MAPs only in relatively small amounts, mainly species that do not grow in Bulgaria

[1] It is uncertain if *H. italicum*, *H. stoechas* or *H. arenarium* is referred to; maybe also a mixture of more than one species (D. LANGE, pers. comm.)

or are protected or subjected to quotas, such as *Rhamnus frangula* (cortex), *Catharanthus roseus* and *Arctostaphylos uva-ursi* (leaves) (LANGE & MLADENOVA 1997). Many MAP imports come from Turkey and FYR Macedonia (LANGE & MLADENOVA 1997; see also D. LANGE in section 8 of this study). In the mid-1990s, Bulgaria imported also rose hips from Russia, Albania and FYR Macedonia. These imports were largely re-exported (MLADENOVA 1996, cited in: LANGE & MLADENOVA 1997).

Trade Structure and Companies

Until the end of the era of the Socialist Republic of Bulgaria, trade in MAPs and other NTFPs was almost exclusively controlled by the state-owned trading companies 'Bilkocoop' and 'Bulgarcoop' (LANGE & MLADENOVA 1997). Since that time, a considerable number of private trading companies have entered the market. The former state companies had the lead at the Bulgarian market, until 'Bilkocoop' was bought by 'Bulgarcoop' in 1996 (LANGE & MLADENOVA, 1997). Both companies still exist today as separate branches; 'Bilkocoop' is active at the Bulgarian domestic market and 'Bulgarcoop' at the international market. Contrary to most of the private companies, 'Bilkocoop' and 'Bulgarcoop' pay cash, which is a considerable advantage for the collectors. However, both branches do not contract individual collectors directly (L. EVSTATIEVA, pers. comm.).

Today, about 10 large wholesalers share the largest portion of the Bulgarian MAP market. In addition, 50-60 smaller trading companies are active in Bulgaria; for some of them MAP trade is only one aspect of their economic activities (LANGE, 1998a).

The majority of MAPs are collected by individuals who are contracted or seasonally employed either by intermediate traders or directly by trading companies (P. ZHELEV, pers. comm.). Direct contracts are predominantly concluded through regional companies (P. ZHELEV, pers. comm.). Intermediate traders sell the MAP material purchased from collectors to large trading companies (preferably national export firms), or to pharmaceutical companies (P. ZHELEV, pers. comm.). These wholesalers export most of the MAP raw material; large quantities are shipped via the international market place Hamburg (P. ZHELEV, pers. comm.). Some companies also sell the MAPs to pharmaceutical companies or process parts of the MAP raw material into final products such as herbal teas, tinctures, pharmaceutical products and others. The majority of these domestically produced goods are sold on the national market (P. ZHELEV, pers. comm.). This chain of custody applies to the trade in nearly all MAP species.

The trade giant 'Bulgarcoop' still operates purchase centres, warehouses and laboratories in most of the larger villages in MAP harvesting areas. For many years, the company has given advice to harvesters, supported farmers with seeds and shoots, and guaranteed certain purchase volumes to the collectors (LANGE & MLADENOVA 1997); most of these activities, however, have been stopped in the mid-1990s. 'Bulgarcoop' processes parts of the purchased MAP raw material itself, selling the products to pharmacies, the pharmaceutical and food industries, or serving the domestic market (chiefly herbal and medicinal teas) (LANGE & MLADENOVA 1997). Most of the smaller trading companies are family-owned, and export all or most of the MAP raw material purchased. Frequently, the smaller companies purchase MAP raw material at higher prices than 'Bulgarcoop' in order to withstand the competition from the market. A number of these companies have founded the 'Private

Herb Exchange', which, like 'Bulgarcoop', supports farmers and trains harvesters (LANGE & MLADENOVA 1997). Usually, export companies in Bulgaria do not supply the retail trade but sell their goods to wholesalers abroad. They prefer MAP species that can be sold either in large volumes or at high prices (KUPKE et al. 2000).

Table 9-4: Ten of the most commonly traded MAP species in and from Bulgaria: quantities, average market prices and percentage of wild-collection.

Species	Estimated amounts traded [tonnes]	Average market price [US$/kg dried material]	Share of wild-harvested MAP material in trade [%]
Rosa canina s.l.	1,000	0.75	80
Urtica dioica	270	0.50	100
Vaccinium myrtillus	250	2.20	100
Sambucus ebulus	250	2.00	100
Tilia spp.	150	1.30	100
Matricaria recutita	120	0.50	30
Hypericum perforatum	50	0.50	100
Origanum vulgare	11	0.70	80
Primula veris	6	2.00	100
Plantago spp.	6	1.00	100

Estimations refer to 2001. Data provided by P. ZHELEV. According to L. EVSTATIEVA, the six most important MAP species traded in and from Bulgaria currently are: *Rosa canina*, *Tilia* spp., *Crataegus monogyna*, *Sambucus ebulus*, *Urtica dioica* and *Prunus spinosa*. However, no exact data could be provided.

Since 1999, export companies have suffered from the drastic, 30-fold increase in the 'forest tax' (tax on collection and export of MAPs). As a reaction, they have founded the 'Association of Herb Producers and Mushroom Suppliers' representing harvesters and producers, and informing about new tendencies on the market (KUPKE et al. 2000).

Between 1992 and 1995, the most important MAP species exported from Bulgaria were:
Tilia tomentosa, *Mentha* x *piperita*, *Althaea officinalis* (mainly from cultivation), *Matricaria recutita, Valeriana officinalis* (mainly from cultivation), *Rosa canina*, *Urtica dioica*, *Taraxacum officinale*, *Thymus* spp., *Satureja montana*, *Melissa officinalis*, *Sambucus ebulus*, *Sambucus nigra*, *Hypericum perforatum*, *Crataegus* spp., *Juniperus communis*, *Aesculus hippocastanum*, and *Vaccinium myrtillus* (LANGE 1996b). In terms of quantities, the most important MAP species traded in and from Bulgaria in 2001 were *Rosa canina*, *Urtica dioica*, *Vaccinium myrtillus* and *Sambucus ebulus* (Tab. 9-4; P. ZHELEV, pers. comm.)

In most species, nearly all the raw material traded in and from Bulgaria was sourced from wild-collection. Among the most frequently traded species, only *Matricaria recutita* (about 70 %) and *Rosa canina* (about 20 %) were also obtained from cultivation. The raw material of the majority of MAP species is destined for the international market (Tab. 9-5). Some species, like *Rosa canina*, are predominantly traded on the domestic market. The raw material is processed by national companies. Bulgaria has a long-standing tradition of producing essential oils. The traditional production of these essential oils, especially high quality rose-oil, is still maintained. In 1994/1995, Bulgaria produced an estimated 750-1,000 kilogrammes of rose-oil (KUPKE et al. 2000).

Table 9-5: Ten of the most commonly traded MAP species in and from Bulgaria: share of the local, national and international markets.

Species	Local market [%]	National market [%]	International market [%]
Rosa canina s.l.	20	60	20
Urtica dioica	0	70	30
Vaccinium myrtillus	5	25	70
Sambucus ebulus	5	25	70
Tilia spp.	5	45	50
Matricaria recutita	10	50	40
Hypericum perforatum	0	10	90
Origanum vulgare	30	40	30
Primula veris	5	60	35
Plantago spp.	0	20	80

Estimates refer to 2001. Data provided by P. ZHELEV and sourced from the Annual Report of Regional Inspectorates of Ministry of Environment and Water regarding the amounts of MAPs collected and the quota for export. The estimates are very rough, because companies are often not open to give away information on market issues (L. EVSTATIEVA, pers. comm.).

During the last 10 years, Bulgaria had tried to increase its harvests from wild-collection of medicinal and aromatic plants. However, the international market stagnated and the MAP quantities collected in Bulgaria declined (P. ZHELEV, pers. comm.). The increasing competition by low-price drugs from countries such as Albania and the high national taxation on NTFPs in Bulgaria probably puts additional pressure on Bulgarian MAP collection and trade.

9.4 Croatia

Exports and Imports

The volume of Croatian medicinal and aromatic plant (MAP) exports has increased gradually during the last decade (for details, see D. LANGE in section 8 of this study). According to the Croatian Chamber of Economy, 1,856 tonnes of MAP raw material were exported from Croatia in 2001 (ŠATOVIĆ 2002). These trade figures do not differentiate between MAP raw material sourced from cultivation or from wild-harvesting and in some cases also make no distinctions between individual species. Camomile (*Matricaria recutita*; from cultivation) accounted for about 60 % (1,207 tonnes) of these exports in 2001 (ŠATOVIĆ 2002). The export seems to be largely dominated by MAPs sourced from cultivation. Export destinations are mainly European countries, especially Bosnia-Herzegovina, Yugoslavia, Slovenia, Austria, Germany, Sweden, Italy, FYR of Macedonia but also the USA (ŠATOVIĆ 2002). The volume of MAP material imported into Croatia amounted to 2,463 tonnes in 2001, and therefore exceeded 2001 export volumes (ŠATOVIĆ 2002).

Trade Structure

Medicinal and aromatic plants are usually harvested either by individual collectors or by collectors contracted by larger trading companies, which buy the raw material from their collectors at certain trading points throughout the country. Beside these regional trading points belonging to the trading companies, individual MAP collectors also sell their raw material at local markets, to local pharmacies

or health food stores or to traditional healers (Z. ŠATOVIĆ, pers. comm.). The trading companies sell the raw material to pharmacies, health food stores or other wholesalers. Larger trading companies tend to export the MAP raw material or supply pharmaceutical, cosmetics or food companies (Z. ŠATOVIĆ, pers. comm.).

The majority of MAPs collected from the wild in Croatia appear to be exported. Exact data cannot be obtained; therefore, only rough estimations about the species-specific export share can be given (Z. ŠATOVIĆ, pers. comm.). In most species, an estimated portion of only about 10 % is traded on the domestic market (Tab. 9-6). Among these species are *Betula pendula*, *Equisetum arvense* and *Juniperus communis*. For species such as *Salvia officinalis* and *Tilia cordata*, the export is estimated to account for only about 50 % of the raw material collected; the remaining 50 % are traded locally or on the domestic market (Z. ŠATOVIĆ, pers. comm.). *Castanea sativa* is believed to be exclusively collected for the local market (Tab. 9-6).

Table 9-6: Trade in 22 of the most important MAP species harvested from the wild in Croatia. Estimated percentage of local, domestic and international trade.

MAP species	Local market [%]	National market [%]	International market [%]
Abies alba	0	10	90
Aesculus hippocastanum	0	10	90
Betula pendula	0	10	90
Calluna vulgaris	0	10	90
Castanea sativa	100	0	0
Equisetum arvense	0	10	90
Geranium robertianum	0	10	90
Helichrysum italicum	0	100	0
Juniperus communis	0	10	90
Plantago lanceolata	0	30	70
Polygonum aviculare	0	10	90
Rosa canina s.l.	50	50	0
Rubus fruticosus	0	30	70
Salix alba	0	30	70
Salvia officinalis	0	50	50
Sambucus ebulus	25	50	25
Sambucus nigra	25	50	25
Solidago gigantea	0	10	90
Tilia cordata	25	25	50
Tilia platyphyllos	25	25	50
Urtica dioica	25	25	50
Viscum album	0	10	90

Data reflect only rough estimates and were provided by Z. ŠATOVIĆ.

Species-specific quantities of MAPs currently traded on the national and international markets in and from Croatia cannot be estimated. The average current market prices are unknown (Z. ŠATOVIĆ, pers. comm.), because collectors and traders being questioned are reluctant to give away information on these issues.

Trading Companies

Similar to its neighbouring countries, trade structures in Croatia changed as a result of the breakdown of the former Yugoslavia and the state-controlled structure of economy. The deregulation of the market resulted in a number of new private companies active in MAP trade and processing. Some pharmaceutical and cosmetic products based on medicinal and aromatic plants are produced in the country (KUPKE et al. 2000).

Today, the most important trading companies for medicinal and aromatic plants are (B. MARKOVIĆ, pers. comm.):

- Belupo d.o.o. Zagreb
- Biopharm d.o.o. Zagreb
- Dietparm d.o.o. Zagreb
- Ektoherbalia d.o.o. Zagreb
- Farmacija d.d. Zagreb
- Farmacom d.o.o. Osijek
- Franck d.d. Zagreb
- Hospitalija d.d. Zagreb
- Ireks Aroma d.o.o. Zagreb
- Jadran – Galenski Laboratorij d.o.o. Rijeka
- Jadran Pharma d.d. Rijeka
- Krka-Farma d.o.o. Zagreb
- Lek Zagreb d.o.o. Zagreb
- Medical Intertrade d.d. Zagreb
- Medifarm d.o.o. Varaždin
- Medika d.d. Zagreb
- Natur Produkt d.o.o. Zagreb
- Oktalpharma d.o.o. Zagreb
- Pliva d.d. Zagreb

'Pliva d.d.', Zagreb and 'Frack d.d.', Zagreb dominate the market (Z. ŠATOVIĆ, pers. comm.).

In 1991, permits relating to the wild-harvesting of 87 medicinal plant species were given to nine companies, and the quantity to be collected was set at about 109 tonnes; the companies that obtained permits were (B. MARKOVIĆ, pers. comm.):

- BELOSIC Proizvodnja Biljnih Ekstrakta Zagreb
- Elkisir Bjelovar
- H.M.A. d.o.o. Rasinja
- Jan Spider d.o.o. Pitomača
- Jastreb d.o.o. Duga Resa
- MD-Alma Novska
- Norma Rijeka

- Suban d.o.o. Samobor
- Terra Magnifica d.o.o. Donji Stupnik

Unfortunately, no more up-to-date information about permits and companies involved could be obtained.

Croatian trading companies also complain about the low prices of MAP material collected in Albania, Bulgaria and Turkey and regard these countries as fierce competitors. As a consequence of the low market prices, some companies have started to consider developing domestic processing facilities or merging with processing companies to be able to export value-added products such as essential oils.

Many Croatian MAP trading companies are worried about the future market potential for wild-harvested MAPs, because the constant and reliable quality and purity of the collected raw material cannot be guaranteed (Z. ŠATOVIĆ and T. KURBANOVIĆ, pers. comm.).

The producers and processors of medicinal herbs in Croatia have become affiliated to the Croatian Chamber of Commerce; the aims of this chamber are (1) to encourage co-operation, (2) to strengthen the links between research institutes, private companies and governmental agencies, and (3) to work on regulations and legislation affecting the production, processing, quality control and trade of medicinal plants (ŠATOVIĆ 2002 and Z. ŠATOVIĆ, pers. comm.).

9.5 Romania

Exports and Imports

Romania exports only about 10 % of the annual medicinal and aromatic plant (MAP) exports of its neighbour, Bulgaria, and MAP import volumes were below 50 tonnes per annum in the 1990s (for details see D. LANGE in section 8 of this study). However, compared to most other Southeast European countries, in Romania a larger share of the domestic MAP production is traded and consumed on the national and local markets (Tab. 9-7).

Trading Companies

During the era of communism, the state-owned trading company ‘PLAFAR’ (founded in 1948) had the monopoly in the collecting, purchasing and trading of medicinal and aromatic plants in Romania (LANGE 2000). Although deregulation of the market was followed by the foundation of various new, private trading companies in the early 1990s, PLAFAR remains the leading MAP trading company in Romania (LANGE 2000; A. BLUMER and D. LANGE pers. comm.). This firm operates nine district branches and purchase centres throughout the country (LANGE 2000; Gh. COLDEA, pers. comm.); these branches are Botosani, Iasi, Bucureşti, Cluj, Brasov, Timisoara, Constanta, Mures and Maramures (MURARIU 2002).

The most important MAP trading companies in Romania are (A. BLUMER and Gh. COLDEA, pers. comm.):

- SN Plafar Bucureşti (state company with branches in the counties)
- SC Herbarum Veronicae Bucureşti
- SC Flopeda Com Diosig
- SC Fares Orastie
- SC Penexport Arges
- SC Rombio Dej
- SC Rust New Company Iasi
- SC Prodplant Impex Reghin
- SC Penexport Arges
- SC Mimol Oradea
- SC Prodimpex BRM Bucureşti
- SC In.Co.N. Suceava
- SC Prodnatur Cluj

Most regional companies have about 10-15 acquisition centres in a county or district. They temporarily employ local personnel (Gh. COLDEA, pers. comm.). The PLAFAR-Cluj branch, for instance, acquires MAPs from 46 acquisition centres in four counties. The branch employs about 85 permanent staff while 40 staff members have temporary contracts (Gh. COLDEA, pers. comm.).

To date, five enterprises for processing MAPs have been established: 'Vitasana' in Brasov, 'Herborium' in Cluj, 'Vorel' in Piatra Neamt, 'Digitalis' in Orastie and 'Naturavit' in Oradea (MURARIU 2002).

Trade Structure

The chain of custody in Romanian MAP trade is diverse and complex, today. Field collectors either sell their MAPs either directly to processing companies, wholesalers or export traders or to intermediate traders. Intermediate traders sell to wholesalers, export companies or pharmaceutical or processing companies (A. BLUMER, pers. comm.). Most smaller companies have specialised in certain ways of trading, whereas 'PLAFAR' operates on all levels of trade and processing (A. BLUMER, pers. comm.). Some of the private companies do not contract their own collectors, but buy MAP raw material only from the intermediate trade or from small, local companies (A. BLUMER, pers. comm.).

The trade in MAPs collected from the wild is controlled in Romania. Two control mechanisms apply: licencing and taxation. For the commercial collection of MAPs, licences are required. Licenses are released upon 'environmental authorisation' (A. BLUMER and Gh. COLDEA, pers. comm.). These authorisations stipulate species, quantities and regions of collection. In addition, companies that export MAP material have to pay a tax for every kilogramme exported. For international trade, the companies are required to obtain an Environmental Permit for Export (EPE) issued by the Ministry of Water and Environmental Protection. The income from this tax is to be used by the authorities to safeguard

national parks and biosphere reserves that do at present not have a proper administration or sufficient inspection personnel (Gh. COLDEA, pers. comm.). In fact, these taxes are not paid to the respective protected areas but to the Ministry of Environment; these revenues do not even flow back into biodiversity and protected area departments but are spent as a part of the overall budget (A. BLUMER, pers. comm.).

The Romanian MAP trade is less export-related than the trade in most other Southeast European countries. According to Gh. COLDEA, 10-15 % of the MAPs traded annually are destined for local markets, 20-25 % for the national market and 60-70 % for the international market (Tab. 9-7; Gh. COLDEA, pers. comm.).

Other estimates, however, presume that the majority of MAPs (in terms of quantities) is traded at the domestic market and as little as 10-20 % enter the international trade (C. DRAGULESCU and A. BLUMER, pers. comm.). This would match MURARIU'S (2002) estimate that about 11,280 tonnes of dried MAP raw material were collected in Romania in 2001, taking into account that only about 1,000 tonnes enter the international trade annually.

Table 9-7: Trade in the twelve most important MAP species harvested from the wild in Romania. Estimated percentage of local, domestic and international trade.

MAP species	Local market [%]	National market [%]	International market [%]
Achillea millefolium	25	25	50
Allium ursinum	10	0	90
Arctium lappa	0	20	80
Arnica montana	10	0	90
Artemisia absinthium	20	30	50
Betula pendula	10	40	50
Crataegus monogyna	20	25	55
Petasites hybridus	0	10	90
Tilia cordata	15	15	70
*Tilia argentea (*1)*	20	20	60
Rubus idaeus	10	15	75
Vaccinium myrtillus	15	20	75

Data provided by GH. COLDEA.

(*1) *Tilia argentea* = synonym of *T. tomentosa* (D. LANGE, pers. comm.)

In any case, the international demand for MAPs from Romania has stagnated or decreased during recent years, except for the demand from East European countries. Consequently, the revenues earned from MAP trade have decreased together with falling market prices for MAPs in Romania (Gh. COLDEA, pers. comm.).

In 2001, the highest relative revenues were earned from the trade in *Arnica montana* (flowers; US$15/kg) and *Allium ursinum* (leaves; US$ 5.50/kg) (Tab. 9-8). In terms of volume and revenues, the largest share had *Vaccinium myrtillus* (fruits) with a total revenue of US$ 5 million in 2001 (which

equals only US$ 2/kg), and *Rubus idaeus* (fruits) with a sales total of about US$ 2 million (US$ 1.3/kg) (Tab. 9-8).

In the near future, trade structures in Romania will change again. PLAFAR's domination of the Romanian MAP market has declined continuously over the last couple of years, and there is an increasing number of small and medium-sized private companies competing on the market (e.g. 'Herbarium'). 'PLAFAR' is going to be privatised in the near future. In order to re-structure the market, there is an initiative to form a 'Guild of MAP Industry Companies' under the patronage of the General Union of the Industries in Romania (A. BLUMER, pers. comm.)

Table 9-8: Trade in the twelve most important MAP species harvested from the wild in Romania. Quantities traded and estimated revenues in 2001.

MAP species	Parts traded	Amounts traded in 2001 [tonnes]	Total revenues from trade [US$]
Vaccinium myrtillus	fruits	2,500.0	5,000,000
Rubus idaeus	fruits	1,500.0	2,000,000
Tilia cordata	flowers	85.0	510,000
*Tilia argentea (*1)*	flowers	75.0	240,000
Betula pendula	leaves	75.0	45,000
Crataegus monogyna	flowers + leaves	58.0	52,000
Arnica montana	flowers	28.0	420,000
Petasites hybridus	roots	20.0	60,000
Artemisia absinthium	herb	16.0	24,000
Achillea millefolium	flowers	13.0	13,000
Arctium lappa	roots	10.5	30,500
Allium ursinum	leaves	9.0	50,000

Data provided by Gh. COLDEA.

(*1) *Tilia argentea* = synonym of *T. tomentosa* (D. LANGE, pers. comm.)

10 Wild-Collection of MAPs in or near Protected Areas

The five countries studied have a very different approach to nature protection by protected areas, both in practice and in relation to national legislation. As a result, the PA network differs considerably (Tab. 10-1).

Table 10-1: Number of national parks and other protected areas in AL, BiH, BG, HR and RO and area covered (May 2002).

Country	Number of national parks	Number of other large PAs (over 1,000 ha)	Total area of all PAs [ha]	[%] of state territory covered by PAs
Albania	13	26	163,816	5.80
BiH	2	4	27,091	0.58
Bulgaria	3	41	498,650	4.90
Croatia	8	18	589,690	6.70
Romania	13	25	1,444,575	6.08

For details cf. Appendix A. Data are taken from a list published by UNEP-WCMC (Internet) and updated with the help of the local co-ordinators of each country.

Except for Bosnia-Herzegovina, all countries selected for this study have an elaborate system of protected areas, which in total cover at least 4.5 % of each state's territory. Biosphere reserves are still a widely unknown category in the Balkans. Of the countries studied, only Bulgaria and Romania have established biosphere reserves.

Country-specific regulations apply to the collection of and trade in medicinal and aromatic plants (MAPs) from protected areas. In the majority of the countries studied, the collection of MAPs in protected areas is restricted or prohibited.

10.1 Albania

Albania has improved its system of protected areas during the past decade (cf. also section 5.1). In 2002, a new network of protected areas (designated according to the IUCN categories) has been set up by the Directorate of Protected Area Management in Albania (WCPA web page). To date, this network includes four strictly protected areas (IUCN Cat. Ia), 13 national parks (IUCN Cat. II), four nature monuments (IUCN Cat. II), 26 nature reserves (IUCN Cat. IV), three protected landscapes (IUCN Cat. V) and four resource reserves (IUCN Cat. VI) (for a complete list cf. Appendix A.1). In addition, 15 important bird areas have been identified in Albania (REC 2000a). The famous nature park of Butrint in Southern Albania has been acknowledged by UNESCO as a heritage site for its outstanding archaeological and biodiversity values (A. VASO, pers. comm.).

Until 1992, there was no specific legislation defining protected areas and regulating their management. Legislation applicable to protected areas was related to the 'Law for Forests' (1962) and the management defined by the forest service (Z. DEDEJ, pers. comm.). Since 1992, the national status of the protected areas has been defined by the 'Forest Law'; the function and management of protected areas are now regulated by the recently approved 'Protected Areas Law' (2002) (Z. DEDEJ, pers.

comm.; for details about these laws cf. section 11.3.1). The 'Direction General of Forests and Pastures' (DGFP) is the Albanian state authority in charge of the management of the national parks (Z. DEDEJ, pers. comm.).

Table 10-2: The 15 most collected medicinal and aromatic plant (MAP) species in Albanian national parks.

Species	Estimated range of MAP volumes collected in NPs in 2001 [tonnes]
Salvia officinalis (*1)	70-170
Thymus vulgaris	40-140
Origanum vulgare	100
Satureja montana	45-100
Juniperus oxycedrus	85
Rubus idaeus	22-80
Trifolium spp.	52
Melissa officinalis	20-50
Crataegus monogyna	7-40
Juniperus communis	5-25
Sideritis raeseri	5-25
Hypericum perforatum	4-24
Rosa canina s.l.	20
Primula veris	7-15
Orchis morio (*2)	3-10

Estimated range of annual quantities of MAPs collected in 2001. The estimates of Zamir Dedej, Director of the Nature Resources Management and Biodiversity Directorate, Ministry of Environment, Tirana and Konstandin Dano (Head of the DGFP) differ considerably. The lower estimated amounts are DGFP estimates, the higher data are estimates by the Ministry of Environment.

(*1): Most likely includes *S. fruticosa* (D. LANGE, pers. comm.).

(*2): *Orchis morio* is most probably a collective denomination for all orchid species collected for the production of salep. Not only *Orchis* spp. but also other genera may be included (D. LANGE, pers. comm.).

In some of the areas now protected, wild-harvesting of MAPs is a traditional practice among the local population. Before the 1990s, harvesting activities were organised by the Protected Areas Authority, whereas today only local people collect MAPs in protected areas (A. VASO, pers. comm.). MAPs and other NTFPs are collected inside protected zones, especially in forest areas. In national parks, wild-collection still (legally) continues, whereas in most other protected areas it is prohibited (Z. DEDEJ, pers. comm.). According to the law, the DGFP should annually define the MAP species and quantities that are allowed to be collected and traded. The quantities collected within the 13 national parks are considerable. In 2001, the volume of the 15 most collected MAP species in national parks mounted up to 485-956 tonnes (Tab. 10-2). In national parks, the most frequently collected MAP species are *Salvia* spp., *Thymus vulgaris*, *Origanum vulgare, Juniperus spp.* and *Satureja montana*. Some endangered species are also collected in national parks, namely *Gentiana lutea*, *Colchicum autumnale*, *Orchis morio*, *Sideritis raeseri* and *Betula pendula* (Z. DEDEJ, pers. comm.). According to D. LANGE (pers. comm.) the collection of 3-10 tonnes of '*Orchis morio*' or other orchids' daughter bulbs would

indicate about 2 million bulbs collected annually, which seems to be a very high quantity. Except for those species mentioned in Tab. 10-2, the amounts of collected raw material of species regarded as endangered in Albania are unknown. No MAPs are cultivated within national parks.

In Albanian national parks MAPs are mainly collected either by farmers or by collectors of national or international companies (Z. DEDEJ, pers. comm). The most important companies that are active in MAP collecting from national parks are 'EUROCOL', 'Alb-Ducros' and 'Filipi Ltd.'. About 35,000 collectors are working for these companies (Z. DEDEJ, pers. comm.). They earn a maximum of US$ 200 per month for their MAP collection activities. There is no difference in the social status of collectors in national parks and those active in other parts of Albania (Z. DEDEJ, pers. comm.). However it should be emphasised that both the quantity and the quality of the MAP material collected in protected areas is often better than in other collection areas, because the impact on the plant associations is usually smaller within the PA territories than outside them (A. VASO, pers. comm.).

MAP collection in and trade from national parks is, in theory, controlled by the Forest Inspectorate (armed Forest Service Police; 'Law on the Forests and the Forest Service Police', Art. 54-60) of the Forest Service Directorate in each prefecture on a daily basis. In practice, the Forest Police do not have the necessary knowledge and understanding of medicinal and aromatic plants and therefore cannot control collection and trade effectively (A. VASO, pers. comm.). The Forest Police do not have clear information about the quantities permitted to be harvested and about species that should not be collected because they are endangered (A. VASO, pers. comm.). The collectors' organisation 'Albaflor' (for details cf. section 7.1) assists in the control. No monitoring system has yet been established for MAP collection in protected areas (Z. DEDEJ, pers. comm.).

Nearly 100 % of the MAP material collected in national parks is destined for international trade (Z. DEDEJ, pers. comm.). The large trading companies have built up direct links to the harvesters, and the MAP raw material collected is usually sold directly to the companies by farmers or collectors, avoiding the intermediate trade (Z. DEDEJ, pers. comm.).

According to our information, in Albania neither officials nor collectors' initiatives presently recognise the potential to use MAP collection and trade in national parks or other protected areas to yield additional income to finance protected areas (Z. DEDEJ, pers. comm.). According to A. VASO (pers. comm.), the situation could change if a management plan that could create an integrated economic system were developed and approved by the protected area authorities. This goal is, however, considered to be unattainable because of the substantial lack of financial resources and adequate staff training (A. VASO, pers. comm.).

10.2 Bosnia-Herzegovina

An effective environmental legislation and the legal definition and establishment of protected areas are still lacking in BiH. Hitherto, protected areas have neither been able to protect endangered species effectively nor facilitate the sustainable use of arable land, forests and NTFPs. The situation has been aggravated by the indirect after-effects of the war and the present complex political structure of BiH

(cf. section 5.2). Bosnia-Herzegovina has still no well-developed system of protected areas; only 0.58 % of the total territory of Bosnia-Herzegovina is protected (cf. Appendix A.2). The intended establishment of Prenj national park (99,000 ha) in the Prenj and Cabulja mountains may provide a good opportunity to protect the medicinal plant population in the region (Seed HQ 2000).

To investigate the present harvesting of medicinal and aromatic plants (MAPs) in and near protected areas in BiH, representatives of the following protected areas were interviewed in August 2002 (D. PEĆANAC, pers. comm; cf. Tab. 10-3):

- **Kozara National Park**, Prijedor; IUCN Cat. V; size: 3375 ha; established in 1967
- **Sutjeska National Park**, Tjentiste; IUCN Cat. II; size: 17,250 ha; established in 1965
- **Blidinje Nature Park**, Prozor, IUCN Cat. IV; size 36,000 ha, established in 1995
- **Hutovo Blato Nature Park**, Hutovo Blato; Bird Reserve; comparable to IUCN Cat. IV; bird reserve since 1954
- **Janj Virgin Forest**, Sipovo; Primeval Reserve; comparable to IUCN Cat. IV; size: 195 ha; established in 1954
- **Lom Virgin Forest**, Drinic; Primeval Reserve; comparable to IUCN Cat. IV; size: 295 ha; established in 1956

The status of the protected areas Kozara, Sutjeska and Hutovo Blato is defined by IUCN categories. The Virgin Forest Reservations Lom and Janj have been established by decision of the State Institute of Cultural Monuments and Natural Rarities in Bosnia-Herzegovina (Lom: No. 385/56, 1956; Janj: No. 245/54, 1954). The status of Blidinje Nature Park is defined by the 'Law of Herzeg Bosnia' (24.03.1995) (D. PEĆANAC, pers. comm.). Both virgin forest reservations are located in the Dinaric mountains, which is one of the largest centres of endemic species in Europe (FUKAREK 1967).

In all categories of protected areas in Bosnia-Herzegovina, the collection of MAPs and other NTFPs is strictly forbidden (D. PEĆANAC, pers. comm.). Therefore, officially nobody collects in protected areas (Tab. 10-3).

The reality may be a little different, and it is supposed, that in some PAs, e.g. in Kozara National Park and Blidinje Nature Park, there is a limited amount of MAP collection by the local population. However these activities probably do not result in the collection of large quantities of MAPs, because in most protected areas activities are controlled by wardens; MAPs are apparently only collected for private or local use. Data on the amounts of MAPs illegally collected in protected areas are not available. There is no cultivation of medicinal and aromatic plants in protected areas (D. PEĆANAC, pers. comm.). In general, management authorities of protected areas in BiH do not see any potential in using part of the revenues created by MAP collection to support protected areas financially (D. PEĆANAC, pers. comm.). However use of wildlife and timber in and from protected areas is partly permitted.

Table 10-3: General, geographic, floral and administrative characteristics of the six protected areas in Bosnia-Herzegovina selected for interviews.

Name of PA	Kozara	Sutjeska	Blidinje	Hutovo Blato	Janj	Lom
Status	national park	national park	nature park	nature park; bird reserve	forest reserve	forest reserve
Location (entity)	RS	RS	FBiH	FBiH	west RS	west RS
Year established	1967	1962	1995	1953	1954	1956
Elevation [m] a.s.l.	100-978	560-2,356	1,200-2,228	1-432	1,180-1,510	1,250-1,420
Climate	Pannonian (dry)	Continental	Continental / Mediterranean	Mediterranean	Illyric (humid) subalpine	Illyric (humid) subalpine
Floral characteristics	no spruce; *Tilia* spp.*; Juniperus* spp.	low elevations: deciduous forests (*Fagus sylvatica*; *Quercus* spp.; *Salix* spp.*; Taxus baccata* high elevations: coniferous forests	*Pinus nigra*; *Pinus sylvestris*; *Fagus* spp.; *Abies* spp.;	Hills: maquis; *Quercetum* spp. Swamps: *Salix pupurea; Fraxinus angustifolia*; *Ficus carica*	*Betula pendula*; *Abies* spp.	*Cardamine trifoliata; Betula pendula; Abies* spp.
IUCN categorised	yes	yes	no	yes	no	no
MAP collection	no	no	yes; only private use	no	no	no
MAP cultivation	no	no	no	no	no	no
Trade of MAPs	no	no	no	no	no	no
Control of collection	wardens	wardens	supervision by administration	wardens	daily supervision	no
Monitoring system of MAP collection	no	no	no	no	no	no
MAP collection as future financial potential	perhaps	no	no	perhaps	no	no

Information provided by the managers of the PAs and by D. PEĆANAC between August 6 and 9, 2002.

Kozara National Park

In Kozara National Park, the periphery of the park is used as hunting zone. The NP authorities decide what species and how many animals are allowed to be hunted during the hunting season (N. STOJANOVIĆ, pers. comm.). In addition, the use of timber from the national park is legal and commonplace. Wardens control these activities.

Kozara National Park is divided into three zones:

- Zone 1: 'Special Area' (52 ha)
- Zone 2: 'Development Area' (600 ha)
- Zone 3: 'General Area' (about 3,000 ha)

Zone 1 is strictly protected. In zone 2, no construction activities are permitted, but it is open for tourist visits. Zone 3 is open for building, recreational and tourist activities. Timber is sourced from this zone.

According to the NP management, 19,400 cubic metres are allowed to be felled annually, 4,500 cubic metres of which are sanitary cuts; the rest enters the market. The felling of trees in Kozara NP has to be approved by the Faculty of Forestry in Banjaluka (N. STOJANOVIĆ, pers. comm.).

MAP species characteristic of Kozara NP include (cf. also Tab. 10-4):
Atropa belladonna, *Allium ursinum*, *Pulmonaria officinalis*, *Thymus serpyllum*, *Rhamnus frangula*, *Potentilla erecta*, *Taraxacum officinale*, *Hypericum perforatum*, *Vaccinium myrtillus*, *Juniperus communis*, *Galium odoratum*, *Fragaria vesca*, *Plantago major*, *Achillea millefolium*, *Valeriana officinalis*, *Colchicum autumnale* and others (D. PEĆANAC, pers. comm.).

In areas immediately bordering Kozara National Park, MAPs are collected. Most frequently collected species include *Viscum album*, *Hypericum perforatum*, *Sambucus nigra*, *Hedera helix*, *Juniperus communis*, *Robinia pseudoacacia*, *Tilia* spp. and *Orchis morio* (cf. Tab. 10-4) The amounts collected in these bordering zones cannot be estimated (N. STOJANOVIĆ, pers. comm.). In Kozara NP, a project on the economic foundation of the forest (including the collection of NTFPs) is in preparation (D. PEĆANAC, pers. comm.). According to information of the park authorities, no protected species are collected near Kozara NP. Unlike most other PA management authorities interviewed, N. STOJANOVIĆ, manager of Kozara NP, thinks that money earned from sustainable harvesting and controlled sale of MAPs could be used to support nature protection and to control activities within the national park.

Table 10-4: The most important MAP species widely found in BiH's protected areas.

MAP species	Kozara	Sutjeska	Blidinje	Hutovo Blato	Janj	Lom
Achillea millefolium	X	X	X	X	X	X
Althaea officinalis				X (C10)		
Arctostaphylos uva-ursi			X (C10)		X (C)	X
Bellis perennis	X	X	X	X	X	X
Betula pendula	X	X	X	X	X	X
Calluna vulgaris				X (C)		
Capsella bursa-pastoris	X	X	X	X	X	X
Cichorium intybus	X					
Colchicum autumnale	X		X (C)			
Dryopteris filix-mas	X	X			X	X
Galium odoratum	X				X	X
Gentiana lutea		X	X (C1-2)		X (C)	
Hedera helix	X (C)	X	X	X	X	X
Helichrysum spp.				X (C)		
Hypericum perforatum	X (C)	X			X (C)	X
Juniperus communis	X (C)		X (C)		X	
'Lichen quercus' (*1)	X					
Orchis morio (Salep; *2)	X (C)					
Oxalis acetosella	X	X	X		X	X
Primula veris		X				
Plantago lanceolata		X				

MAP species	Kozara	Sutjeska	Blidinje	Hutovo Blato	Janj	Lom
Plantago major	X	X				
Potentilla erecta	X					
Quercus spp.	X	X	X	X	X	X
Rhamnus frangula	X	X	X	X	X	X
Robinia pseudoacacia	X (C)					
Rubus fruticosus						X (C)
Rubus idaeus	X	X	X		X	X (C)
Salvia officinalis		X		X (C10)	X	X
Sambucus ebulus		X			X	
Sambucus nigra	X (C)					
Satureja montana				X (C)		
Taraxacum officinale s.l.	X	X	X	X	X	X
Teucrium montanum		X				
Thymus serpyllum	X				X	
Tilia spp.	X (C)					
Urtica dioica	X	X	X	X (C)	X	X
Vaccinium myrtillus	X		X (C30-40)		X (C)	X (C)
Valeriana montana	X (*V. officinalis*)				X	X
Viscum album	X (C)					

Known distribution is marked 'X'. '(C)' indicates that the species is collected in areas bordering the protected area. If the distribution is unknown, the respective fields in the table are blank. If annual amounts collected can be estimated, these estimates are indicated (e.g. 'C10' means an estimated amount of 10 tons collected annually in areas bordering the PA). Information provided by D. PEĆANAC and by managers of PAs.

(*1): *Lichen quercus = Pulmonaria lobata;*

(*2): *Orchis morio*: these data may also refer to other orchid species collected for use in salep production (D. LANGE, pers. comm.).

Sutjeska National Park (Tabs. 10-3 and 10-4)

In Sutjeska National Park, no MAPs are officially collected, but there are limited logging activities within the national park. The core zone of Sutjeska NP remains untouched. Within this zone, there is the Perucica Virgin Forest, an area no one is allowed to enter (B. IVANOVIĆ, pers. comm.). Timber sourced from the peripheral zones of the national park is cut in accordance with the NP management plan and sold in order to provide additional financial resources for the administration of the national park (B. IVANOVIĆ, pers. comm.).

According to the park authorities, limited NTFP collection occurs in the areas bordering Sutjeska NP. These activities, however, do not include harvesting medicinal and aromatic plants but are confined to mushrooms (mainly *Cantharellus sibarius*, *Morchella esculenta* and *Boletus edulis*). B. IVANOVIĆ, deputy manager of protection for Sutjeska National Park, states that no MAPs are collected because trading companies do not show interest to buy MAPs from the area; therefore, the collection and purchase of collected raw material in this area is not organised.

Supervision within the national park is carried out by wardens financed by the Government of the Republika Srpska; the wardens also try to guarantee that no MAPs are collected inside the national park (B. IVANOVIĆ, pers. comm.).

Blidinje Nature Park (Tabs 10-3 and 10-4)

The nature park overlaps with some protected forests in FBiH. Three districts are in charge of management of the nature park: Hercegovacko-Neretvanski District, Zapadnohercegovacki District and Hercegovacko-Bosanski District (M. ANDJELIĆ, pers. comm.).

In Blidinje Nature Park, some MAP species are collected by local people for private use only. These species include: *Colchicum autumnale*, *Gentiana lutea*, *Juniperus communis*, *Vaccinium mytillus* and *Arctostaphylos uva-ursi* (plus the edible boletus (*Boletus edulis*)); quantities collected are very small (M. ANDJELIĆ, pers. comm.). Collection for commercial purposes is forbidden inside the nature park. Officially, the collection of MAPs for private use is also prohibited, but in practice it is tolerated on a small scale. Wardens control the park on a daily basis (M. ANDJELIĆ, pers. comm.).

In the zones immediately bordering Blidinje Nature Park, some MAP species are collected commercially. These include mainly *Juniperus communis* (fruits; 30-40 tonnes/year); *Gentiana lutea* (fresh roots; 1-2 tonnes/year) and *Arctostaphylos uva-ursi* (10 tonnes/year); in addition, about 15 kg dried *Morchella esculenta* are collected in areas bordering the park (M. ANDJELIĆ, pers. comm.). M. ANDJELIĆ suggests that collection of NTFPs should be organised on sustainable and controlled principles, but he fears that commercial use might disturb the system of protection in the park.

Hutovo Blato Nature Park (Tabs. 10-3 and 10-4)

Hutovo Blato Nature Park is an integral part of the Neretva River Delta, which belongs to Croatia. The park is managed by the public enterprise 'Park of Hutovo Blato' (D. PEĆANAC, pers. comm.). Inside the park no MAPs are collected because this activity is forbidden (S. MATIĆ, pers. comm.). Twelve wardens patrol the park daily. A number of people live at the periphery of Hutovo Blato Nature Park (inside the PA); some of them are reported to grow *Zea mays* (D. PEĆANAC, pers. comm.).

However, medicinal and aromatic plants are collected in areas immediately bordering the nature park. The most important species collected are: *Salvia officinalis*, *Althaea officinalis*, *Helichrysum italicum*, *Calluna vulgaris*, *Satureja montana* and *Urtica dioica*. Except for *Salvia officinalis* and *Althaea officinalis* (10 tonnes/year each), the amounts annually collected cannot be estimated (S. MATIĆ, pers. comm.).

S. MATIĆ, director of the Department for Protection of Nature and Environment of Hutovo Blato Nature Park, suggests that the rational and controlled collection of stable populations of MAPs, if it was legal, could result in an additional income for the park.

Janj Virgin Forest (Tabs. 10-3 and 10-4)

Janj Virgin Forest is located in the Stolovaš Massif in the western part of Republika Srpska, about 30 kim southeast of Šipovo on dolomitic mountain slopes (Fig. 5-3; FUKAREK 1967). Its vegetation is classified into three groups: spruce forest, Illyric beech forest and scotch pine forest. The spruce forest group dominates and covers about 95 % of the territory of the forest park. Only the small sub-alpine zones (4 %) belong to the Illyric beech forest and the scotch pine forest groups (1 %; final stage of vegetation succession in this area (FUKAREK 1967)).

The Janj forest PA is managed by the Lumber Camp Gorica, with which it overlaps. Inside the protected area, collection of MAPs is strictly forbidden and the Janj PA is patrolled daily (D. KVRGIĆ, pers. comm.). Some MAP species such as *Sambucus nigra*, *Vaccinium myrtillus*, *Hypericum perforatum* and *Gentiana lutea* (most probably ssp. *symphyandra*; D. LANGE, pers. comm.) are harvested in neighbouring areas. The quantities harvested cannot be estimated (D. KVRGIĆ, pers. comm.).

The sustainable collection of MAPs to gain additional income for the management of the reserve is not regarded as an option (D. KVRGIĆ, pers. comm.).

Lom Virgin Forest (Tabs. 10-3 and 10-4)

Lom Virgin Forest is located 7 kilometres south of Drinić in the limestone Lom Mountain Massif in western RS. The reservation has a humid climate; two forest phytocenosis groups characterise the territory of the Lom reservation (FUKAREK 1967): the spruce forest group and the Illyric beech forest group. In the spruce forest group, some species can be found that are missing or scarce in Janj Virgin Forest, like *Fagus sylvatica* and *Acer pseudoplatanus*.

The Lom Forest PA is managed by the Lumber Camp Ostrelj, with which it overlaps. As in other similar reserves, the collection of MAPs is strictly forbidden inside the protected area. The technical staff of the Lumber Camp Ostrelj patrol the territory, however not on a daily basis (R. BANJAĆ, pers. comm.). According to R. BANJAĆ, technical director of Lumber Camp Ostrelj, illegal cutting occurs, because the number of staff is too small to check the whole territory daily.

MAP species such as *Vaccinium myrtillus*, *Rubus idaeus* and *Rubus fruticosus* are harvested in neighbouring areas. The quantities harvested cannot be estimated (R. BANJAĆ, pers. comm.).

10.3 Bulgaria

Bulgaria has a comparatively representative and well developed system of protected areas of various categories: three national parks, eight nature parks, 17 biosphere reserves and more than 80 further protected areas cover about 4.9 % of Bulgaria's territory (cf. Appendix A.3). National legislation takes the international legal framework into account. In addition, protected areas are defined and their management is regulated by the 'Act for Protected Areas' (1998) (cf. section 11.3.3).

The collection of medicinal and aromatic plants (MAPs) in national parks and in most other protected areas is basically permitted, but it can be restricted in certain sectors or regions; species-specific restrictions may also apply. A list of MAP species known to be collected in protected areas in Bulgaria is attached (cf. Appendix C.1).

To illustrate the situation of MAP wild-collection in protected areas, interviews were conducted with responsible persons in two national parks (Central Balkan National Park and Pirin National Park) and one nature park (Vitosha Nature Park).

Central Balkan National Park

The park was founded in 1992 (I. NIKOLOV, pers. comm.). The national park partly overlaps with four biosphere reserves (Boutin, Tsarichina, Steneto, Dzhendema) and five other protected areas (Severen Dhendrem, Kozyate stena, Peshtite skalo, Stara reka and Sokolna); the park is managed by the Bulgarian Ministry of Environment and Water. The Central Balkan National Park covers an area of about 44,000 ha and has a high biodiversity of fauna and flora.

Large quantities of MAPs are collected inside and in the vicinity of the NP (I. NIKOLOV, pers. comm.). *Vaccinium myrtillus*, in particular, is heavily harvested (about 20 tonnes annually; cf. Tab. 10-5). Other important species collected inside the NP are *Hypericum maculatum* (2 tonnes/year), *Hypericum perforatum* (1.5 tonnes/year) *Rosa canina* s.l. (7 tonnes/year) and *Plantago* spp. (2 tonnes/year) (Tab. 10-5). No endangered species are officially collected and no MAPs are cultivated inside the park (I. NIKOLOV, pers. comm.).

Due to the quantities of *Vaccinium myrtillus* collected in Central Balkan National Park[1], a project has been started by the park administration and ARD (Agency for Regional Development) to establish the controlled and sustainable use of *Vaccinium myrtillus* in the national park. Over-exploitation should be prevented by evaluation of the current resources and control mechanisms (I. NIKOLOV and P. ZHELEV, pers. comm.). Unfortunately, no further information about this project could be obtained, despite several inquiries.

Table 10-5: Twelve important MAP species wild-collected in and around Central Balkan National Park.

MAP species	Plant parts collected	Estimated MAP volumes collected in/around Central Balkan NP in 2001 [tonnes]
Vaccinium myrtillus	fruits	(in park) 20.00
Rosa canina s.l.	fruits	(around park) 7.00
Plantago spp.	leaves	(around park) 2.00
Hypericum maculatum	herb	(possibly in park) 2.00
Hypericum perforatum	herb	(possibly in park) 1.50
Rubus idaeus	fruits	(possibly in park) 1.20
Origanum vulgare	herb	(around park) 0.60
Tussilago farfara	leaves	(possibly in park) 0.50
Geranium macrorrhizum	leaves	(possibly in park) 0.50
Thymus spp.	herb	(possibly in park) 0.30
Euphrasia officinalis s.l.	herb	(in park) 0.25
Geranium sanguineum	leaves	(possibly in park) 0.20

Estimated annual quantities refer to 2001. These estimates are based on data provided by IVAYLO NIKOLOV, Vice-Director of the Central Balkan National Park. According to information provided by G. STANEVA, some of the mentioned species are not commercially collected in the park, however possibly in neighbouring areas.

[1] *Vaccinium myrtillus* is most likely predominantly collected for food rather than medicinal purposes. The majority of the material collected will be fresh berries. Therefore, the quantities cannot be directly compared to other MAP species collected and traded in dried form (D. LANGE, pers. comm.).

The collection of MAPs in the Central Balkan National Park is carried out either by individual collectors or by harvesters contracted by national trading companies. 'Bioprograma' has contracted about 30 collectors to harvest MAPs in the national park (I. NIKOLOV, pers. comm.). Collectors sell their goods to regional or national companies or their middlemen.

MAPs collected in and around Central Balkan National Park are traded locally (*Vaccinium myrtillus*, *Rubus idaeus*, *Rosa canina*) or on the domestic and international markets (Tab. 10-6). The majority are exported. An especially high percentage of *Vaccinium myrtillus* (80 %), *Hypericum* spp. (90 %), *Euphrasia officinalis* (80 %), *Tussilago farfara* (80 %) and *Plantago* spp. (80 %) enter the international market (I. NIKOLOV, pers. comm.; Tab. 10-6).

According to estimates of I. NIKOLOV, about 20 % of the financial revenues from the trade of MAPs from Central Balkan National Park are earned by the collectors and by intermediate traders each (about 10 % according to estimates by P. ZHELEV). 50 % of the revenues are earned by the wholesalers and up to 10 % of the total price of MAPs subject to trade is passed to the national park Administrative Authorities (I. NIKOLOV, pers. comm.).

Table 10-6: Twelve important MAP species traded from Central Balkan National Park. Estimated species-specific share of local, domestic and international markets.

Species collected in/around Central Balkan NP	Local market [%]	National market [%]	International market [%]
Vaccinium myrtillus	10	10	80
Rosa canina s.l.	10	30	60
Plantago spp.	0	20	80
Hypericum maculatum	0	10	90
Hypericum perforatum	0	10	90
Rubus idaeus	20	20	60
Origanum vulgare	0	50	50
Tussilago farfara	0	20	80
Geranium macrorrhizum	0	25	75
Thymus spp.	0	30	70
Euphrasia officinalis s.l.	0	20	80
Geranium sanguineum	0	25	75

Estimates refer to 2001 and are based on data provided by I. NIKOLOV (cf. Tab. 10-5).

MAP collection in Central Balkan National Park is controlled by the park's administrative authorities. Inspectors regularly check on the collectors with regard to the species and quantities harvested (I. NIKOLOV, pers. comm.). The intermediate traders are controlled in order not to exceed the species-specific quotas permitted. The quotas are laid down in a special list produced by the Regional Inspectorate for Environmental Protection and are updated anually. All species listed in Tab. 10-5 are subject to quotas in Central Balkan NP (I. NIKOLOV, pers. comm.).

The Park Authorities, the Regional Inspectorate for Environmental Protection and the Regional Forestry Service also run a monitoring system raising data on the collection of and trade in medicinal and aromatic plants in Central Balkan National Park (I. NIKOLOV, pers. comm.).

Pirin National Park

Pirin is the oldest Bulgarian national park and, in addition, it is a UNESCO heritage site. The park was founded in 1962 and covers an area of about 40,000 ha (cf. Appendix A.3). The Ministry of Environment and Water is in charge of the administration of Pirin National Park (S. SAVEV, pers. comm.). A large number of medicinal and aromatic plants are collected in and around Pirin National Park, some in considerable quantities (Tab. 10-7)

Table 10-7: Seven important MAP species wild-collected in Pirin National Park.

MAP Species	Estimated MAP volumes collected in Pirin NP in 2001 [tonnes]
Vaccinium myrtillus	50.0
Hypericum perforatum	5.0
Rubus idaeus	(fruits) 5.0
Plantago spp.	2.0
Geranium macrorrhizum	1.0
Thymus spp.	0.5
Viscum album	0.2

Estimated annual quantities refer to 2001. These estimations are based on data provided by SLAVCHO SAVEV, who is engaged in the development of the Management Plan for Pirin National Park.

Vaccinium myrtillus (50 tonnes in 2001), *Hypericum perforatum* and *Rubus idaeus* (5 tonnes in 2001 each) are most frequently harvested from the wild in Pirin NP (Tab. 10-7). In addition to the species mentioned in Tab. 10-7, *Tilia* spp., *Rosa canina* s.l., and *Origanum vulgare* are collected in larger amounts in the vicinity of Pirin NP (S. SAVEV, pers. comm.). According to S. SAVEV's information, no endangered MAP species are collected and no MAPs are cultivated inside the park.

Individual collectors harvest most of the MAPs sourced from inside the park, but national companies and their contracted harvesters are also active, such as 'Herba Media', for which about 50 collectors work in Pirin National Park (S. SAVEV, pers. comm.). These companies provide both the local, domestic and international markets with MAPs collected in Pirin NP.

It is estimated that about 20-30 % (10-15 % according to P. ZHELEV) of the revenues from the sale of MAPs from the park are gained by the collectors, 20-30 % by intermediate traders and 40-50 % by wholesalers. The administrative authorities receive about 3-5 % of the retail price achieved by the sale of MAPs subject to trade from Pirin NP (S. SAVEV, pers. comm.).

The species and quantities collected are controlled by the administration of Pirin NP, which also controls the trade. For this purpose, intermediate traders are checked, both in relation to the species and the quantities collected and traded (S. SAVEV, pers. comm.). Trade is also controlled by issuing collecting licences and imposing quotas plus taxes to be paid for each quota (S. SAVEV, pers. comm.). The quotas are issued for the whole territory; should more than one intermediate trader be active in purchasing material of a certain species on the territory of the park, the quota is divided among the

traders (S. SAVEV, pers. comm.). All species listed in Tab. 10-7 are subject to quotas in Pirin National Park (S. SAVEV, pers. comm.).

Monitoring of the species and amounts collected is undertaken by the national park Administration and the Regional Inspectorate for Environmental Protection on a regular basis; the data are reported to be detailed and reliable enough to make the control effective (S. SAVEV, pers. comm.).

At present, the Management Plan for Pirin National Park is in its final stage of development. In this plan, the principles of sustainable and monitored wild-collection of medicinal and aromatic plants will be included. The plan will most likely be accepted until the end of 2002 (S. SAVEV, pers. comm.). A contribution of revenues from the MAP trade to finance nature protection in Pirin National Park is regarded as an option, but it is believed that this would have only a minor effect, because the NP has a considerable budget to which shares from MAP trade could contribute only a very small proportion (S. SAVEV, pers. comm.).

Vitosha Nature Park

Vitosha Nature Park is one of the oldest protected areas in Bulgaria. It was founded in 1934 and covers a territory of about 26,500 ha (cf. Appendix A.3). The Ministry of Agriculture and Forests and the National Forestry Board are in charge of the park management (D. DIMOVA, pers. comm.).

Medicinal and aromatic plants are collected inside and in the vicinity of Vitosha Nature Park; however, there are no data or estimates available about the quantities collected, because MAPs are collected for private use only; no trading companies collect in Vitosha Nature Park. Very small amounts of MAPs harvested from within the park are sold on local markets (less than 5 % of the quantities collected, according to estimates) (D. DIMOVA, pers. comm.). Individual collectors selling MAPs on local markets may be able to earn the minimum monthly income required to meet the needs of a basic living standard (D. DIMOVA, pers. comm.).

Officially, only plant species that are not protected are collected within the nature park; the species permitted to collect are listed by the Regional Inspectorate for Environmental Protection (D. DIMOVA, pers. comm.). Some endangered MAP species may be exceptionally (illegally) collected in very small quantities. These species include *Gentiana lutea*, *Gentiana punctata*, and *Rhodiola rosea* (D. DIMOVA, pers. comm.).

Most frequently collected MAP species in Vitosha Nature Park include (D. DIMOVA, pers. comm.): *Hypericum perforatum*, *Thymus* spp., *Origanum vulgare*, *Vaccinium myrtillus*, *Taraxacum officinale, Galium verum*, *Arum maculatum*, *Fragaria vesca*, *Rubus idaeus*, *Teucrium chamaedrys*, *Chelidonum majus* and *Allium ursinum*.

As no commercial MAP collection occurs in Vitosha Nature Park, there are no quotas and no licence fees applicable to collection. MAP collection is controlled regularly by inspectors of the Regional Inspectorate for Environmental Protection and the Regional Forestry Service. MAP collection is

monitored by the Directorate of the nature park and the Regional Inspectorate for Environmental Protection (D. DIMOVA, pers. comm.).

According to D. DIMOVA, it is not an option to use parts of the revenues from MAP sale to finance the protected area because there is no commercial MAP collection and trade inside the park.

10.4 Croatia

The preservation of biological and landscape diversity and the declaration of protected areas are regulated in the 'Law on Nature Protection' (Gazette 'Narodne novine' No. 30/94 and No. 72/94; for details cf. section 11.3.4). Depending on the statistics used, between 6.7 % and 7.5 % of the Croatian territory is protected. Croatian protected areas are divided into eight different categories: strict nature reserve, national park, park of nature, natural monument, forest park, architecture monument park, protected landscape and special reserve. At present, a total of 352 protected areas exist on the territory of Croatia, eight of which are national parks, two strict nature reserves and 10 nature parks (Tab. 10-8; for a more detailed list cf. Appendix A.4). All protected areas are subject to strict biodiversity protection measures (Z. ŠATOVIĆ, pers. comm.).

Table 10-8: Categories and current numbers of protected areas in Croatia.

	Category	Level of protection	Number	Total size (km^2)
1	National Park	State	8	759
2	Park of Nature	State	10	4,005
3	Strict Reserve	County	2	24
4	Special Reserve	County	74	318
5	Monument of Nature	County	80	6
6	Protected Landscape	County	32	405
7	Forest Park	County	36	79
8	Park Architecture Monument	County	114	9
Total			352	5,605

From: RADOVIĆ, J. (ed.) 2000. Sightly modified.

Officially, the 'picking, moving from place of growth, disturbing and damaging plant and fungi species and their parts' is forbidden in protected areas, unless a special permit is obtained by the Ministry of Environmental Protection and Physical Planning (D. MATIJEVIĆ, pers. comm.). Obviously, these permits are hardly ever issued. However, small-scale wild-harvesting of medicinal and aromatic plants (MAPs) is taking place in some protected areas. Due to the illegal status of such collecting activities, there are no data available about which MAP species and quantities are harvested from the wild in the respective protected areas. At any rate, medicinal and aromatic plants are only collected by individuals, either park visitors or the local population (D. MATIJEVIĆ, pers. comm.).

There is some indication that sage (*Salvia officinalis*) is collected in Northern Velebit national park as well as in Velebit Nature Park (Z. ŠATOVIĆ, pers. comm.). In the Samoborsko Gorje – Zumberak

Nature Park, a number of different MAP species are likely to be collected; however specific data are unobtainable (Z. ŠATOVIĆ, pers. comm).

MAP wild-collection is reported to be controlled - especially in national parks and nature parks - by law enforcement officers or by inspectors for nature conservation (D. MATIJEVIĆ, pers. comm.). No information could be obtained about how effective these controls might work.

In order to take a closer look at collecting activities in protected areas in Croatia, two national parks and one nature park were chosen; interviews were held with the park authorities. These parks include:

- Plitvice Jezero National Park
- Paklenica National Park
- Biokovo Nature Park

Plitvice Jezero National Park

Plitvice Jezero National Park lies in the Lika-Senj District (Dalmatia) and is – together with Paklenica – the oldest national park on the territory of today's Croatia; it was established in 1949 and has been under strict protection ever since. At almost 30,000 ha, Plitvice Jezero is the largest national park in Croatia (cf. Appendix A.4).

As regulated by Croatian legislation, no MAPs are harvested from the wild in Plitvice Jezero NP. However, there is some small-scale MAP cultivation inside the national park, including *Fragaria vesca* (about 1 ha) and *Calendula officinalis* (about 1 ha) (A. STIPETIĆ, pers. comm.).

Paklenica National Park

Paklenica National Park is located in Northern Dalmatia and was established in 1949. It comprises a territory of roughly 10,000 ha and is managed by the 'Public Institution, National Park Paklenica' in Starigrad-Paklenica (G. LUKAČ, pers. comm.).

As in Plitvice Jezero NP, officially no MAPs or other NTFPs are collected inside the national park. However, small-scale harvesting of medicinal and aromatic plants by private persons and local families or groups is reported to occur in Paklenica National Park (G. LUKAČ, pers. comm.). The species collected include, inter alia, *Salvia officinalis, Satureja montana, Vaccinium myrtillus, Origanum vulgare, Calamintha sylvatica, Calamintha acinos, Teucrium montanum, Ruta graveolens, Foeniculum vulgare,* and *Thymus* spp. The raw material is either collected for private use or is sold on local markets (G. LUKAČ, pers. comm.). In areas bordering the park, bearberry (*Arctostaphylos uva-ursi*) is reportedly collected. No MAP species are cultivated within the national park (G. LUKAČ, pers. comm.).

Despite the official prohibition, these activities seem to be tolerated by the park authorities, as rangers of the reserve administration control NTFP collection and trade inside Paklenica national park (G. LUKAČ, pers. comm.). This tolerance may be due to the fact that the park authorities express their

interest in the idea that a share from the financial benefit of MAP collection and trade in areas bordering Paklenica NP could yield an additional income for the protected area and for the protection of endangered species. Such financing could, for example, help to start a vegetation and biotope mapping project with special focus on medicinal and aromatic plants, and to initiate a monitored and controlled sustainable use of MAPs in the vicinity of the actual national park, where some MAP species are reportedly abundant (G. LUKAČ, pers. comm.).

Biokovo Nature Park

Biokovo Nature Park is located in the Makarska and Zagvozd area in Dalmatia, not far from Split. It stretches across a territory of about 20,000 ha. The park was established in 1981 and is under the administration of the **'**Public Institution Nature Park Biokovo'. The public administration has been in existence since 1991 and the team consists of one forestry engineer, one biologist, two rangers and the park director (D. JURIĆ, pers. comm.).

As in all other protected areas, the wild-harvesting of MAPs and other NTFPs inside the park is officially prohibited; however, park authorities say that private, local collectors and tourists harvest some medicinal and aromatic plant species on a small scale within the park, mainly in those parts where people usually hike and walk, i.e. near mountain roads, paths and park-trails (D. JURIĆ, pers. comm.). Among other species, collection includes *Thymus serpyllum, Salvia officinalis, Gentiana lutea, Teucrium montanum, Satureja montana* and *Rosa canina* (D. JURIĆ, pers. comm.). In Biokovo Nature Park, *Gentiana lutea* is traditionally collected; overexploitation of this species in Biokovo has apparently led to a genetic erosion of *G. lutea* in this area (Z. ŠATOVIĆ, pers. comm.). According to the park authorities, the collection of *G. lutea* continues, although it is an endangered and protected species (protected under the 'Zakon o zastiti prirode 'NN' No. 54, 1976) (D. JURIĆ, pers. comm.).

Occasionally, local residents (mostly older women) would sell MAPs obviously collected in the park in open-air grocery stores (as medicine or for using them in herbal tea mixtures or liquors) (D. JURIĆ, pers. comm.). In areas bordering Biokovo Nature Park, *Salvia officinalis, Satureja montana, Rosa canina* and other MAP species are collected. No MAPs are cultivated in or near the park (D. JURIĆ, pers. comm.).

The management authorities of Biokovo cannot estimate the amount of MAPs collected inside the park, because the administration is still being developed. Although two park rangers patrol the territory, there is not enough personnel to supervise and control the whole area, as the park is in a mountainous area and some parts of it are difficult to reach. However, people appear mostly to collect MAPs for their personal use, and the amounts collected are thought to be very small (D. JURIĆ, pers. comm.). The park rangers do have the authority to inspect any suspicious vehicle and control all suspicious people inside the park. In case of offences against the law, such as collecting MAPs, the rangers are authorised to fine the offender (D. JURIĆ, pers. comm.).

The park authorities of Biokovo Nature Park regard it as their task to limit the collection of MAPs and to try to teach the local population with respect to medicinal and aromatic plants, their status, their

importance for the ecosystem, about endangered and protected species and about appropriate methods for collecting MAPs (outside the protected area). In addition, the park authorities want to promote MAP cultivation in the area (D. JURIĆ, pers. comm.).

The concept of generating additional income for the park management authorities by sharing the financial benefit of MAP collection and trade in areas bordering the nature park is not appreciated by the park authorities (D. JURIĆ, pers. comm.).

10.5 Romania

The first national park in Romania – Retezat – was established as early as in 1935 (**Ministry Council Journal No. 593, March 22, 1935**). Today, Romania has a comprehensive system of protected areas of various categories (for a detailed description of the history of Romanian parks and their individual characteristics see CRISTEA 1995). According to TONIUC et al. (1992), Romanian protected areas comprised 14 national parks, 3 biosphere reserves and 174 other nature reserves in the early 1990s. Quite a number of new protected areas have been added since. Most were re-designated according to the IUCN categories.

Today, there are 13 national parks (Cat. II), six natural parks (Cat. V), 53 scientific reserves (Cat. Ia), 231 natural monuments (Cat. III), 542 natural reserves (Cat. IV) and three biosphere reserves (Tab. 10-9; for a detailed list of the most important protected areas cf. Appendix A.5).

Table 10-9: Romanian system of protected areas. IUCN categories and number of protected areas.

Type	Similar to IUCN Category/ European Designation	Number of protected areas	Total area
Scientific reserves	Ia	53	101,288 ha
National parks	II	13	300,819 ha
Natural monuments	III	231	2,177 ha
Natural reserves	IV	542	117,265 ha
Natural parks	V	6	326,305 ha
Biosphere reserves	Biosphere reserve	Danube Delta Retezat (II) Rodnei (II)	576,216 ha 38,138 ha 47,227 ha
Wetlands of international importance	Ramsar site	Danube Delta Small Island of Braila	576,216 ha 20,455 ha
Natural sites for universal natural heritage	UNESCO World heritage site	Danube Delta	576,216 ha

The list was compiled by A. BLUMER (pers. comm.) and has been slightly modified according to the WCMC list.

Two protected areas are also Ramsar Sites: Danube Delta and the 'Small Island of Braila'. Altogether, there are presently 848 protected areas in Romania, falling into five of the six IUCN categories (**Law No. 5 / 2000**; A. BLUMER, pers. comm.).

In most protected areas, the collection of medicinal and aromatic plants and other NTFPs by individuals is permitted for private use only. Environmental permits for medicinal and aromatic plant (MAP) collection in protected areas are generally not issued to trading companies (A. BLUMER, pers. comm.). Nevertheless, individual collectors collect MAPs in protected areas and sell them to trading companies.

Among the species collected in considerable quantities in protected areas are *Vaccinium myrtillus* (fresh fruits; ca. 500 tonnes/year), *Rubus idaeus* (fresh fruits, ca. 250 tonnes/year) and *Arnica montana* (flowers; ca. 12 tonnes/year) (Gh. COLDEA, pers. comm.).

The protected areas in Romania are defined by the '**Law No. 5 / 2000**', approving the National Plan for Land Use, Section III (protected areas). The '**Law No. 462 / 2001**', approving Ministry Ordinance Mo. 236 / 2000, provides the legal frame for protected areas, natural habitats and wildlife conservation (A. BLUMER, pers. comm.; for details cf. section 11.3.5). However, the implementation of these legal instruments is often very weak. This is mainly due to a lack of personnel in the protected areas to guarantee control and legal implementation and to the insufficiency of the budget of the Ministry of Water and Environmental Protection to be used for funding nature conservation in protected areas (Gh. COLDEA, pers. comm.). The revenues from the taxation of NTFPs levied to trading companies on every kilogramme exported are not – as they are supposed to be – used to finance the work and staff of protected areas authorities, but end up in the overall budget of the Ministry of Water and Environmental Protection (A. BLUMER, pers. comm.).

At present, the Romanian State Forest Administration is in charge of the management of three large protected areas: Retezat National Park, Piatra Craiului National Park and Vanatori Neamt Forest Park. The management is organised within the frame of a GEF project administered by the World Bank and co-financed by the Romanian Government and the State Forest Administration (A. BLUMER, pers. comm.). The three parks are part of a pilot project on protected area management. Even with these funds, the parks do not have enough staff (only seven people per administration) to control the area effectively (A. BLUMER, pers. comm.).

Most other protected areas have no proper management or no management at all. An exception is Danube Delta Biosphere Reserve, which now has an adequate administration and a Management Plan (**Ministry Order MO 282/2002**, approved 18.04.2002).

Interviews about MAP collection in and trade from protected areas provided data from:

- Danube Delta Biosphere Reserve
- Muntii Apuseni National Park
- Rodna National Park
- Retezat National Park
- Piatra Craiului National Park

Danube Delta Biosphere Reserve

The Danube Delta region was first protected in 1938 and became a biosphere reserve in 1991. It is a UNESCO world heritage site and is one of the few protected areas in Romania which have their own Reserve Administration (A. POPESCU and Gh. COLDEA, pers. comm.).

In some parts of the reserve, such as Caraorman and Letea, medicinal and aromatic plants are collected. Projects on the sustainable use of natural resources in Danube Delta Biosphere Reserve are related primarily to fisheries, game hunting and cattle grazing. The most important MAP species collected inside the reserve are *Matricaria recutita* and *Hippophae rhamnoides* (A. POPESCU, pers. comm.; Tab. 10-10).

Medicinal and aromatic plants in the Danube Delta Biosphere Reserve are almost exclusively collected by the local population for private consumption (G. BABOIANU, pers. comm.). However, parts of the MAP material officially collected for 'private use' are apparently sold to 'PLAFAR' (Tulcea Branch; A. POPESCU, pers. comm.). About 70 % of this MAP material is reported to enter the national market and 30 % are sold on local markets (Tab. 10-10); nothing is exported (A. POPESCU, pers. comm.).

Table 10-10: The four most important MAP species collected in and traded from Danube Delta BR. Estimated species-specific amounts collected and shares of local and national markets.

Main species collected in Danube Delta BR	Quantity [tonnes] (estimated)	Local market [%] (estimated)	National market [%] (estimated)
Matricaria recutita	(flowers) 10.0	20	80
Hippophae rhamnoides	(fruits) 2.0	10	90
Symphytum officinale	(rhizomes) 1.5	0	100
Gypsophila paniculata	(roots) 0.5	0	100

Estimates refer to 2001 and are based on data provided by A. POPESCU.

Officially, such commercial use of MAPs in DDBR is not allowed unless permission is obtained prior to collection. In order to be able to sustainably use and manage the natural resources in Danube Delta BR, the Danube Delta Institute elaborates an annual 'Assessment Study of the Vegetal Resources in DDBR', listing estimates of the quantities of MAPs that can safely be collected during the coming season, without posing a threat to the species' populations in the biosphere reserve (G. BABOIANU, pers. comm.). These estimates are based on the species' current populations, growth rates and annual replacement rates. Sporadic, endangered and rare plant species are excluded from this list (e.g. *Salix alba* and *Artemisia pontica*). The study comprises the species' distribution inside DDBR, the flowering periods and previously collected quantities, and it suggests the species-specific quantities for harvesting for the forthcoming season in each district of the biosphere reserve (G. BABOIANU, pers. comm.). For 2002, a total of 11,761 kg of medicinal and aromatic plants allowed to be collected was assessed. Based on this assessment, the Danube Delta BR Authorities issue harvesting permits for commercial MAP collection, obtainable from the authorities upon payment of US$ 15 per person and year. The income from these permits is no income for the DDBR Authorities but it is added to the Tulcea County Council budget (G. BABOIANU, pers. comm.).

Unfortunately, the potential of harvesting MAPs in DDBR for commercial purposes is not used. For the year 2002, the total annual request for commercial MAP collection was as low as 15 kilograms (G. BABOIANU, pers. comm.). Apparently, the fees to be paid for the permits are very unpopular, and collectors may try to by-pass these fees if possible.

No endangered species are collected. According to information from A. POPESCU, almost no MAP collecting activities are known from areas in the vicinity of Danube Delta biosphere reserve. MAP collection is controlled by the Administration of Danube Delta Biosphere Reserve through continuous supervision by inspectors (A. POPESCU, pers. comm.). Trade in MAPs is not controlled, other than that the legal mechanisms apply (cf. sections 9.5 and 11.3.5). MAP collection is monitored by the Administration of the Reserve and the Nature Monuments Commission (A. POPESCU, pers. comm.).

No pilot projects about the sustainable use of MAPs and the use of revenues for biosphere reserve funding are known; however, the Reserve Administration states that wild-collection of MAPs should guarantee that local populations of MAP species remain stable (A. POPESCU, pers. comm.).

Muntii Apuseni National Park

Muntii Apuseni has been a national park since August 2000. The park is defined and established according to the '**Law No. 462 / 02.08.2000**' (Law for Protected Areas). The park is managed by the Agency of Environmental Protection (in Alba, Bihor and Cluj districts), and it overlaps with a number of nature reserves: Cetatcea Radesei; Izvoarele Somesului, Cetatile Ponorului and Valea si Tinovul Izbuca Mic (T. MIRCEA and Gh. COLDEA, pers. comm.).

MAPs are collected inside the national park in all areas that are not strictly preserved core zones. The most important MAP species collected are *Vaccinium myrtillus* and *Rubus idaeus* (Tab. 10-11; T. MIRCEA, pers. comm.).

Table 10-11: The four most important MAP species collected in and traded from Muntii Apuseni National Park. Estimated species-specific amounts collected and shares of local, national, and international markets.

Main species collected in Muntii Apuseni NP	Quantity [tonnes] (estimated)	Local market [%]	National market [%]	International market [%]
Vaccinium myrtillus	(fruits) 36	10	25	65
Rubus idaeus	(fruits) 27	10	30	60
Vaccinium vitis-idaea	(fruits) 20	n.a.	n.a.	n.a.
Arnica montana	(flowers) 12	10	0	90

Fruit quantities most likely refer to fresh material. Estimates refer to 2001 and are based on data provided by T. MIRCEA.

MAPs in Muntii Apuseni National Park are almost exclusively collected by individual persons who sell their goods to 'PLAFAR', Cluj Branch. The majority is exported (Tab. 10-11; T. MIRCEA, pers. comm.). The individual collectors receive only about 4-5 % of the revenues from MAP trade; about 15 % are earned by the intermediate trade, 75 % by wholesalers and some 5 % goes to the administrative authorities (T. MIRCEA, pers. comm.). The share of the administrative authorities (Forestry Administration, because Muntii Apuseni NP has no independent administrative authority) is

paid by those selling the plants on the market, which usually are the wholesalers (A. BLUMER, pers. comm.).
Some other MAP species are collected in the vicinity of Muntii Apuseni National Park, among which are *Rhamnus frangula* (cortex; about 1.8 tonnes annually), *Epilobium parviflorum* (herb; about 0.9 tonnes annually) and *Centaurium erythraea* (herb; about 0.6 tonnes annually) (T. MIRCEA, pers. comm.). No endangered species are collected and no MAPs cultivated in the park.

MAP collection is controlled by the Environmental Protection Agencies of the counties at the level of trading companies. The trade is controlled by the Ministry of Water and Environmental Protection by export-licences (T. MIRCEA, pers. comm.). No monitoring system is in operation; a planned pilot project is described in detail in section 12.3.

Rodna National Park

The Rodna area has been protected as a nature reserve since 1932. In 1990, Rodna became a national park (IUCN categorised), which is managed by the Forest Office of Bonsa-Maramureş County (M. HUTANU and Gh. COLDEA, pers. comm.).

Table 10-12: The three most important MAP species collected in and traded from Rodna National Park. Estimated species-specific amounts collected and shares of local, national, and international markets.

Main species collected in Rodna NP	Quantity [tonnes] (estimated)	Local Market [%]	National Market [%]	International Market [%]
Vaccinium myrtillus	(fruits) 28	10	10	80
Rubus idaeus	(fruits) 12	10	15	75
Vaccinium vitis-idaea	(fruits) 9	5	0	95

Fruit quantities most likely refer to fresh material. Estimations refer to 2001 and are based on data provided by M. HUTANU.

In the forest zone of Rodna NP, a number of MAPs are collected. The most important are *Vaccinium myrtillus*, *Rubus idaeus* and *Vaccinium vitis-idaea* (Tab. 10-12; M. HUTANU, pers. comm.). MAPs are mainly collected by local people and local companies like 'Agral Prod S.R.L.', Zalau, 'SVZ Romania S.R.L.', Bucureşti and 'Silvexim S.A.', Bucureşti, and their contracted harvesters (M. HUTANU, pers. comm.). Most of the material collected is traded on the international market (Tab. 10-12; M. HUTANU, pers. comm.).

About 20 % of the revenues from MAP trade in Rodna NP are reported to be earned by local collectors, 15 % be the intermediate trade and 62 % by wholesalers. Only about 3 % of the revenues goes to the administrative authorities (forest administration) of the park (M. HUTANU, pers. comm.); this share is reportedly paid by the wholesalers (A. BLUMER, pers. comm.).

In the vicinity of Rodna NP, a number of other medicinal and aromatic plants species are collected, such as *Betula pendula* (leaves; 5 tonnes in 2001), *Hypericum perforatum* (flowers; 9 tonnes in 2001) and *Rhamnus frangula* (cortex; 3 tonnes in 2001) (M. HUTANU, pers. comm.). No endangered species are collected and no MAPs cultivated inside Rodna NP.

MAP collection is controlled by the administration of the park and the regional government through the quantity limits imposed by the licences issued by the Environmental Protection Agency. Trade control operates through issuing export licences (M. HUTANU, pers. comm.). No monitoring system is run and no pilot projects are known of in Rodna National Park (M. HUTANU, pers. comm.).

Retezat National Park

Retezat is one of the oldest protected areas in Romania, established in 1935 (for details compare CRISTEA 1995). Today, Retezat National Park overlaps with the Retezat Biosphere Reserve and the Retezat Scientific Reserve (I. GHIRA and Gh. COLDEA, pers. comm.). Retezat has its own managemant (Retezat National Park Management Authority).

Inside Retezat, no MAPs are collected because the collection and commercial use of medicinal and aromatic plants and other NTFPs inside protected areas is not promoted (A. BLUMER, pers. comm.). This applies probably even more strongly for Retezat than for other protected areas because Retezat is the oldest and most traditional national park in Romania; the protection of its unique natural beauty may seem to be more important than commercial use of its resources, whether or not this use is sustainable. However, individual, non-commercial collection of NTFPs for private use by the local population is most likely also taking place in Retezat; this type of collection is difficult to control (A. BLUMER, pers. comm.) and it is apparently tolerated by the park authorities. Some areas inside Retezat national park are used for cattle grazing (I. GHIRA, pers. comm.). No pilot projects are known of in Retezat NP.

Piatra Craiului National Park

The first parts of Piatra Craiului were protected as early as 1938 to preserve the unique landscape of this area, which is exceptionally rich in both geological and biological phenomena (for a detailed description see CRISTEA 1995). Piatra Craiului is a national park since 1990. Smaller quantities of MAPs are collected inside the park, and there are also other forms of land use and use of natural resources such as cattle grazing, game hunting and timber production (S. VASILE and Gh. COLDEA, pers. comm.).

The most important MAPs collected in Piatra Craiului NP are *Vaccinium myrtillus*, *Pinus mugo and Primula officinalis* (Tab. 10-13; S. VASILE, pers. comm.).

Table 10-13: The four most important MAP species collected in and traded from Piatra Craiului NP. Estimated species-specific amounts collected and shares of local and national markets.

Main species collected in Piatra Craiului NP	Quantity [tonnes] (estimated)	Local Market [%]	National Market [%]
Vaccinium myrtillus	(fruits) 2.50	15	85
Pinus mugo	(leaves) 2.00	10	90
Primula veris	(herb) 0.50	20	80
Carum carvi	(fruits) 0.25	n.a.	n.a.

Fruit quantities most likely refer to fresh material. Estimates refer to 2001 and are based on data provided by S. VASILE.

Medicinal and aromatic plants are almost exclusively collected by 'PLAFAR' (Braşov Branch) and its contracted harvesters (S. VASILE, pers. comm.). Most MAPs collected are sold on the national market and almost nothing is exported (Tab. 10-13; S. VASILE, pers. comm.).

According to information provided by S. VASILE, no MAPs are collected in the vicinity of the national park. No endangered species are reported to be collected and no MAPs are cultivated inside Piatra Craiului National Park (S. VASILE, pers. comm.).

The administration of the reserve continuously controls MAP collecting and the populations of MAP species. The trade of MAPs is not controlled. Collection is monitored by Romsilva and by the Nature Monuments Commission (S. VASILE, pers. comm.).

No pilot projects have been initiated in Piatra Craiului NP and such projects are, according to the NP Management, not desirable, because they might open the way for companies to increase the pressure on the MAP populations inside the national park (V. MIRCEA and S. VASILE, pers. comm.).

11 Legal and Financial Aspects Relevant to MAP Collection and Trade

11.1 International and European Legislation

The most important international conventions relevant to the collection and trade of medicinal and aromatic plants (MAPs) are the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), the Convention on Biological Diversity (CBD) and the Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention) of the Council of Europe.

On EU-level are important: the '**Habitats, Fauna and Flora Directive**' (Council Directive 92/43, amended by Council Directive 97/62), the Council Regulation **No. 2092/91** (amended by No. 1935/95) on organic production of agricultural products, EC Regulation **No. 338/97** (amended by No. 1808/2001) on the protection of species of wild fauna and flora by regulating trade therein (implementation of CITES at EU-level) and the EC-Directive **No. 91/356,** which lays down the principles of '**Good Manufacturing Practice**' for medical products of human use.

For some East and Southeast European countries the EU-legislation already plays a certain role, even though they are no EU Member States. Bulgaria and Romania are accepted as EU accession candidate countries, likely to join the Union in 2007[1]; Albania, Croatia and Bosnia-Herzegovina are in the 'Stabilisation and Association Process' of the West Balkans. Some East and Southeast European countries have already started to change their national legislation in order to facilitate the adoption of EU regulations. Even for countries that have not changed their national legislation, EU regulations are important for exports to the EU Member States.

11.1.1 Convention on Biological Diversity (CBD)

The purpose of the Convention on Biological Diversity (CBD, 5 June 1992) is convention is the conservation of biological diversity and the sustainable use of its components. In addition, benefits from the utilisation of genetic resources shall be fairly and equitably shared. The convening Parties shall develop national biodiversity strategy and action plans (Art. 6) in order to guarantee the conservation and the sustainable use of biological diversity. They shall also identify and monitor components of biological diversity important for its conservation and sustainable use with regard to the indicative list of categories set down in Annex I (Art. 7). The Parties shall take steps for in-situ and ex-situ conservation of biological diversity. In particular, they shall establish a system of protected areas and promote environmentally sound and sustainable development in areas adjacent to protected areas.

Art. 15 regulates the access to genetic resources and Art. 16 the access to and the transfer of technology. It is stated tha the States have sovereign rights over their natural resources. The access to genetic resources for environmentally sound uses by other contracting parties shall be facilitated. In return, the access and the transfer to other contracting parties of technologies that are relevant to the

[1] The suggestion that Bulgaria and Romania could join the EU in 2007 has been accepted by the European Commission; however, it has not yet been approved by the member states.

conservation and sustainable use of biological diversity and the use of genetic resources shall be provided and/or facilitated.

11.1.2 Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention)

The Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention, 19 September 1979) aims at protecting the European wild flora and fauna and their natural habitats, paying particular attention to endangered and vulnerable species. Especially for those plant species listed in Appendix I of the Bern Convention, each contracting party is obliged to undertake appropriate and necessary legislative and administrative measures for effective conservation of these species and their habitats. The deliberate picking, collecting or uprooting of these species shall be prohibited. Each Contracting Party shall, as appropriate, prohibit the possession or sale of these species.

Six MAP species are subject to the Bern Convention (Appendix I): *Origanum dictamnus*, *Artemisia granatensis*, *Atropa baetica*, *Comperia comperiana*, *Himantoglossum caprinum*, *Rheum rhapontikum* and *Trapa natans* (LANGE 1998a).

11.1.3 Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)

The Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES; Washington, March 1973) aims at ensuring that the international trade in species of wild fauna and flora is sustainable; in CITES terminology: 'not detrimental to the survival of the species'. However, CITES does not protect animal or plant species from negative impacts caused by the destruction of natural habitats and by national use and trade of the species listed. The species are listed in three appendices:

Appendix 1: The commercial international trade with species which are threatened with extinction is banned, whereas non-commercial trade and trade in cultivated material can be allowed. For these specimens export and import permits are required. The export must not be detrimental to the survival of that species, and specimens must not be obtained in contravention of the laws of the state of export. The import must not be detrimental to the survival of the species involved, and imported specimens must not be primarily used for commercial purposes. No European medicinal and aromatic plant species is listed in Appendix I (LANGE 1998a).

Appendix II: Species listed in Appendix II are subject to regulation and monitoring. For the trade in these species, export permits of the country of origin are required, testifying that export is not detrimental to the survival of the species. 47 European medicinal and aromatic plants are listed in Appendix II, in particular *Adonis vernalis* and orchids of the genera *Orchis*, *Ophrys*, *Barlia*, *Anacamptis*, *Platanthera*, *Gymnadenia* and *Himantoglossum* which are used for the production of salep.

Appendix III: This appendix shall include 'all species which any Party identifies as being subject to regulation within its jurisdiction for the purpose of prevention or restricting exploitation, and as needing the co-operation of other parties in the control of trade.' For these species export permits are required and imports must not be obtained in contravention of the laws of the state of export. No European medicinal and aromatic plant species is listed in Appendix III.

11.1.4 EC Regulation No. 338/97 on the Protection of Species of Wild Fauna and Flora by Regulating Trade therein

The EC Regulation No. 228/97 (of 9 December 1996; amended by No. 2724/2000 and No. 1808/2001, adopted by EC No. 938/97 and EC No. 2307/97) is a legislative instrument that regulates the international trade in wild fauna and flora at EU level. It implements the provisions of CITES in the European Union, applying stricter measures than CITES. Especially the import and export of endangered species and the transport of and trade in these species within the EU is subjected to this regulation.

Annex A includes those species listed in Appendix I of CITES for which the Member States have not entered a reservation and any species which is or may be, in demand for utilisation in the Community or in international trade and which is either threatened with extinction or so rare that any level of trade would imperil the survival of the species. In addition, species whose listing is essential for the effective protection of an endangered taxon are listed in Annex A. For these species export and import permits are required.

Annex B includes all species listed in Appendix II of CITES and some species listed in Appendix III. For Annex B species the EC Regulation No. 338/97 implements a stricter measure than CITES. It requires not only an export permit but also an import permit upon import into the EU. The import into the Community must not have a harmful effect on the conservation status of the species. In Annex B, *Adonis vernalis* is listed.

Annex C includes the species listed in Appendix III of CITES and those species of Appendix II of CITES, for which the Member States have entered a reservation.

Annex D includes only non-CITES species, which are imported into the Community in such numbers as to warrant monitoring. MAP species listed in Annex D are: *Arctostaphylos uva-ursi*, *Arnica montana*, *Cetraria islandica*, *Menyanthes trifoliata*, *Lycopodium clavatum* and *Gentiana lutea*.

11.1.5 EC Habitats, Fauna and Flora Directive

The EC Habitats Directive (Council Directive No. 92/43 of 21 May 1992, amended by Council Directive No. 97/62 of October 1997) aims at the protection and conservation of wild fauna and flora and their natural habitats. For this purpose, a European network of protected areas shall be installed ('Natura 2000').

For the survival of the flora and fauna species included in Annex II, special protected areas have to be gazetted. According to Article 13, the Member States shall take appropriate measures to establish a strict system of protection of the plant species listed in Annex IV (b), prohibiting the deliberate picking, collecting, cutting, uprooting or destruction of the listed species. Art. 14 regulates that if, in the light of the surveillance provided for in Article 11, Member States deem it necessary, they shall take measures to ensure that the taking in the wild of specimens of species of wild fauna and flora listed in Annex V as well as their exploitation is compatible with their being maintained at a favourable conservation status. Possible measures are, amongst others:

- the regulation of the periods and/or methods of taking specimens
- the establishment of a system of quotas or of licences for taking specimens
- the regulation of purchase, sale, offering for sale, keeping for sale or transport for sale of specimens
- an assessment of the effect of the measures adopted

Ten medicinal and aromatic plant species are listed in the directive's annexes : *Artemisia granatensis*, *Atropa baetica* and *Origanum dictamnus* (Annex II), *Saxifraga vayredana* (Annex IV (b)), and *Arnica montana*, *Galanthus nivalis*, *Gentiana lutea*, *Lycopodium annotinum*, *Lycopodium clavatum*, and *Ruscus aculeatus* (Annex V(b)) (LANGE, 1998a).

11.1.6 EC Regulation No. 2092/91

The EC Regulation No. 2092/91 (24 June 1991, amended by No. 1935/95 of 22 June 1995) deals with the organic production of plants and agricultural goods at EU level. Any producer who intends to market products as organic or bio-products within the EU has to comply with this regulation. This concerns also products that are not produced but intended to be marketed in the EU. The collection of wild edible plants and parts thereof are considered organically produced, if (1) growing areas have received no treatments with products other than those listed in the regulation for a period of three years before collection, and if (2) collection is sustainable (according to Annex I of the regulation No. 2092/91, as amended by Council Regulation No. 2608/93 of 23 September 1993). Guarantees that these requirements have been met are demanded (according to Annex III of Council Regulation No. 2092/91, as amended by Council Regulation No. 2608/93).

11.1.7 Regulations on Medicinal Products and 'Good Practices' Guidelines

In nearly all EU Member States, phytomedical products are classified as 'medicine'. Intermediate phyto-products, which are used for further processing by an authorised sales company or for producing formulas are not regarded as 'medicine' (directive 65/65/EWG) and are therefore not subjected to licensing.

The **EU directive 91 / 356 (Good Manufacturing Practices)** provides a guide about practices, methods and procedures to be complied with during the production of all medicinal products imported into the EU or produced in one of its Member States. A functioning pharmaceutical system of quality control must be introduced (Art. 6) and the production has to be documented (Art. 9). If products are imported from Non-EU countries, the importer has to guarantee that the producers have the licences

required and that they are subjected to GMP requirements comparable to those in the European Union. The 'PIC-GMP-Guide' (Pharmaceutical Inspection Convention) is a similar regulation and represents the most important relevant GMP regulation outside the EU (http://www.picscheme.org/index.htm).

Besides these regulations, there is a considerable number of – not obligatory – guidelines on 'good practices'. EUROPAM (European Herb Growers Association) has issued GWP (Good Wildcrafting Practices) and GAP (Good Agricultural Practices; relevant for cultivation of MAPs) guidelines. More specifically related to MAPs are the GFCP (Good Field Collection Practices for Medicinal Plants). The European Agency for the Evaluation of Medicinal Products has developed GACP (Good Agricultural and Collection Practices).

Another set of 'good practices' has been developed by WHO. These include GSP (Good Sourcing Practices) and GFCP, which are hitherto only available as draft versions. The purpose of GFCP guidelines is to define procedures for safe, environmentally sound and sustainable harvesting methods of raw medicinal plant material from the wild in order to ensure a certain quality standard. GFCP describes general strategies and basic methods for small- to large-scale field collection of fresh medicinal plant materials in compliance with local, national and international regulations on the access to genetic resources and on biodiversity. Besides quality management issues, the guidelines shall also help to protect endangered and threatened species in order to conserve natural resources and the environment, thus ensuring future supplies of medicinal plants from the wild.

11.1.8 Membership to International Conventions

Table 11-1: Membership to CITES, CBD and Bern Convention of the five countries studied.

	CITES	CBD	Bern Convention
Albania	(-)	(+) entered into force 05.04.1994; no NBSAP	(+) entered into force 01.05.1999
Bosnia-Herzegovina	(-)	(-)	(-)
Bulgaria	(+) entered into force 16.04.1991	(+) entered into force 17.07.1996; NBSAP	(+) entered into force 01.05.1991
Croatia	(+) entered into force 12.06. 2000	(+) entered into force 08.01.1997; NBSAP	(+) entered into force 01.11.2000
Romania	(+) entered into force 16.11.1994	(+) entered into force 15.11.1994; NBSAP	(+) entered into force 01.09.1993

Albania

Albania has signed as a party to the following conventions directly or indirectly related to the protection of natural resources (REC 2000a; see also Tab. 11-1):

- **Ramsar Convention** on Wetlands (Ramsar 1971; AL: ratified March 29, 1996)
- **Bern Convention** on the Protection of Flora and Wildlife Fauna of the Natural Environment in Europe (Bern 1979; AL: ratified March 2, 1998)
- **Paris Convention** on the Protection of the World Cultural and Natural Heritage (Paris 1972; AL: March 20, 1979)

- **ESPOO-Convention** on Environmental Impact Assessment in a Transboundary Context (Espoo, October 4, 1991)
- **Helsinki-Convention** on the Protection and Use of Transboundary Watercourses and International Lakes (Helsinki 1992; AL: ratified on January 5, 1994)
- **Rio-Convention:** United Nations Framework Convention on Climate Change (Rio de Janeiro 1992; AL: entered into force January 1, 1995)
- **Convention on Biological Diversity** (Rio de Janeiro, 1992, AL: entered into force April 5, 1994)
- **Convention on Desertification** and Dryness Aiming to Combat these Phenomena in Countries which Suffer from them (December 4, 1996)
- **Aarhus-Convention** on Access to Information, Public Participation in Decision-Making and Access to Justice in Environmental Matters (Aarhus June 25, 1998)

Albania's participation in **CITES** (Convention on International Trade in Endangered Species of Wild Flora and Fauna; Washington 1973) is in preparation.

Bosnia-Herzegovina

The state of BiH has not signed many international conventions with respect to natural bio-resources since 1992. BiH is a member of the following relevant international conventions related to nature conservation:

- **Ramsar Convention** on Wetlands of International Importance (Ramsar 1971)
- **Paris Convention** on the Protection of the World Cultural and Natural Heritage (Paris 1972)
- **Rio-Convention:** United Nations Framework Convention on Climate Change (Rio de Janeiro 1992)

In addition, Bosnia-Herzegovina has ratified the Basel and Kyoto Conventions in April 2000. The country is in the ratification procedure of the CBD (Convention on Biological Diversity) and the Sofia Convention (Danube River).

Bulgaria

Bulgaria is actively participating in the 'Natura 2000' system of protected areas and is in the process of adopting the EU 'Habitats, Fauna and Flora' Directive. Bulgaria has ratified most of the important international conventions related to nature conservation and environmental protection (see also Tab. 11-1):

- **Ramsar Convention** on Wetlands of International Importance (Ramsar 1971; BG: ratified September 24,1975, entered into force 24.01.1976)
- **Paris Convention** on the Protection of the World Cultural and Natural Heritage (Paris 1972; BG: entered into force December 17, 1975)
- **CITES (**Convention on the International Trade in Endangered Species of Wild Fauna and Flora) (Washington 1973; BG: entered into force April 16, 1991)

- **Bern Convention** on the Protection of Flora and Wildlife Fauna of the Natural Environment in Europe (Bern 1979; BG:entered in to force May 1, 1991)
- **ESPOO-Convention** on Environmental Impact Assessment in a Transboundary Context (Espoo, October 4, 1991)
- **Rio-Convention:** United Nations Framework Convention on Climate Change (Rio de Janeiro 1992; BG: entered into force August 10, 1995)
- **Convention on Biological Diversity** (Rio de Janeiro, 1992, entered into force July 17, 1996)
- Convention on **Protecting the Black Sea against Pollution**
- **Sofia Convention** on Co-operation for the Protection and Sustainable Use of the Danube River (Sofia 1994; BG: ratified June 29, 1994)

Croatia

Croatia has ratified quite a number of different international conventions directly or indirectly relevant for nature conservation and medicinal and aromatic plants (see also Tab. 11-1). The former Socialist Republic of Yugoslavia was already party to some of these conventions, with the party rights and duties mostly taken over by Croatia after the country became independent in 1993. Among these conventions are:

- **Ramsar Convention** on Wetlands of International Importance (Ramsar 1971; ratified: FSRY 09/1977; Croatia 12/1993)
- **Paris Convention** o the Protection of the World Cultural and Natural Heritage (Paris 1972; ratified: FSRY 06/1974; Croatia 12/1993)
- **CITES (**Convention on the International Trade in Endangered Species of Wild Fauna and Flora) (Washington 1973; ratified: Croatia, 09/1999 (Official Gazette 'Narodne novine' 12/99))
- **Bern Convention** on the Protection of Flora and Wildlife Fauna of the Natural Environment in Europe (Bern 1979; ratified: Croatia, 04/2000 (‘Law on Ratification of the Convention on the Conservation of European Wildlife and Natural Habitats’, Official Gazette 'Narodne novine' 06/2000)
- **ESPOO-Convention** on Environmental Impact Assessment in a Transboundary Context (Espoo 1991; ratified: Croatia 06/1996)
- **Convention on Biological Diversity (CBD)** (Rio de Janeiro 1992; ratified: Croatia 06/1996)
- **Rio-Convention:** United Nations Framework Convention on Climate Change (Rio de Janeiro 1992; ratified: Croatia 02/1996)
- **Sofia Convention** on Co-operation for the Protection and Sustainable Use of the Danube River (Sofia 1994; ratified: Croatia 02/1996)
- **Kyoto Protocol** to the Framework Convention on Climate Change (Kyoto 1997)

Romania

In Romania, the EU ‘Habitats, Fauna and Flora’ Directive has been translated into national legislation (Law on Protected Areas). Romania is a PIC member (accession to PIC in May 1982, to the PIC scheme in November 1995). An number of further international conventions and agreements have

been translated into national legislation (see also Tab. 11-1). In the field of nature conservation, these are (A. BLUMER, pers. comm.):

- The '**Law No 69/1994**', on the Trade in Endangered Species of Wild Fauna and Flora (**CITES**)
- The '**Law No. 13/1993**', on the Conservation of Wildlife and Natural Habitats (**Bern Convention)** and
- The '**Law No. 58/1994**', on the Rio Convention on Biodiversity (**CBD**)

Further important, environment-related conventions ratified by Romania are:

- **Ramsar Convention** on Wetlands of International Importance (Ramsar 1971; RO: entered into force September 21, 1991)
- **Paris Convention** on the Protection of the World Cultural and Natural Heritage (Paris 1972; RO: entered into force August 16, 1990)
- **ESPOO-Convention** on Environmental Impact Assessment in a Transboundary Context (Espoo 1991; RO: ratified: February 26, 1991)
- **Rio-Convention:** United Nations Framework Convention on Climate Change (Rio de Janeiro 1992; RO: ratified September 06, 1994)
- Convention on **Protecting the Black Sea against Pollution** (RO entered into force January 15, 1994)
- **Sofia Convention** on Co-operation for the Protection and Sustainable Use of the Danube River (Sofia 1994; RO: ratified June 29, 1994)

11.2 International Financing

As international financing is a very complex topic and as it is no focal point of this study, this chapter will only illustrate a few examples of international projects, organisations and initiatives financing environmental and nature protection issues in the five countries studied. These examples will only show possibilities and are in no respect representative.

11.2.1 Albania

After 1991, a number of countries, foreign institutions and NGOs started to become active in nature conservation and environmental protection in Albania. Financial support is usually granted not only to environmental issues but also to other – mainly social – issues that are inseparably linked to the potential transformation of Albanian use of land and natural resources into sustainable management and use. As internal Albanian funds for environmental issues are still scarce, international financing is the main source for funding environmental projects in the country (REC 2000a).

The Swedish aid in Albania (**Sida**: 'strategi för bistandet till Kosovo (FRJ), Albanien och Makedonien') has as its central goals to support the stability in the region, the safe return of refugees, democratic development in Albania and a socially sustainable market economy, which should help generate sustainable growth and alleviate poverty (REC 2000a). However, Sida does not finance

particular environmental programmes in Albania and maybe also does not include environmental issues in the development programmes as earmarked by the NEAP Programme (1993). Strengthening of the environmental profile of future Sida projects in Albania is planned (REC 2000a).

Since 1995, the German GTZ, together with the German Federal Ministry for Economic Cooperation and Development (BMZ), has financed a co-operative project between PPNEA (Protection and Preservation of Natural Environment in Albania), the NEA, GTZ and Euronatur on biodiversity conservation in the Lake District of Ohrid, Prespa and Little Prespa (Gesellschaft für Technische Zusammenarbeit 1998), within the framework of 'Implementing the Biodiversity Convention'. A large conservation area was established in the region, including the sustainable use of MAPs (FREMUTH et al. 1999).

Between 1995 and 1998 3.3 million ECU of the **EU PHARE Programme** (AL 93/06) supported a large number of environmental projects in Albania, some of which were also of direct or indirect relevance to MAPs and to protected areas. Among these projects were a pilot project for the preparation of a management and conservation plan for Dajti National Forest Park, and a management plan for the Karavasta Lagoon.

Since 1998, **GEF** (Global Environment Facility)-funded projects have started in Albania. Among these projects are (REC 2000a):

- The Strategy for Biodiversity Conservation / Biodiversity Action Plan for Albania (US$ 96,000; implemented through the IBRD)
- Lake Ohrid Management Plan (1.78 million US$ for the Albanian part; implemented by the World Bank and co-financed by the Governments of FYR of Macedonia and Albania)

A few local projects (some of which focus on MAPs) have been funded by different NGOs. A training package, managed by REC Albania, was funded for two consecutive years; this package included the professional strengthening of the Forest Police staff of protected areas (A. VASO, pers. comm.). A World Bank programme on the institutional strengthening of the DGFP has been developed and is being implemented in 2002/2003 (A. VASO, pers. comm.).

11.2.2 Bosnia-Herzegovina

The war has driven most NGOs out of the country. In 1990, several hundred NGOs were active on the territory of today's BiH; in 1996, only 17 were left, with no possibility that they could be active throughout the entire country (REC 2000b). The remaining NGOs could of course not be financed by the Government and had to rely on funds from abroad, which reduced their operational opportunities. More than half of the environmentally active NGOs remaining were located in Sarajevo and Banjaluka, in 1999 (REC 2000b). Most are grassroots organisations with no paid staff and no adequate offices nor equipment. Since 1998, the REC Country Office BiH has started to provide institutional and financial support to environmental NGOs. Slowly, international donors are starting to invest again in BiH. Their activities are co-ordinated by the Office of the High Representative (OHR), to which all international donors must report their activities (REC 2000b).

The **World Bank** has financially supported the First National Environmental Action Plan in 2000/2001 (REC 2000b). It should be developed in both entities simultaneously to assist the state of BiH to develop a sound legal environmental framework and stronger institutions. An environmental action plan for the whole state should be developed to provide long-term priorities (REC 2000b).

The Swedish aid agency, **Sida,** provides financing for their, basically social, programme 'Landstrategi för arbetet med Bosnien-Herzegovina', which has, however, also some environmental relevance. Among other goals, Sida supports socially sustainable market economy, which can help generate sustainable growth and alleviate poverty (REC 2000b). BiH has become Sweden's third largest recipient of assistance; between 1996 and 1999 Sida committed US$ 125 million to 250-300 projects in BiH. Environmental projects have so far not been priority activities and no particular environmental programmes have been financed by the Sida funds (REC 2000b).

Donor programmes in the herbal industry sector are operated by the German **GTZ** (in both Banjaluka, RS and Sarajevo, FBiH), trying to establish industry associations, registration of companies for organic certification and marketing of certified products from sustainable wild-collection at both regional and international markets (SEED HQ 2000; DUNJIC & DUERBECK, 2002). Together with the Swiss Import Promotion Program **SIPPO**, the GTZ organises buyer-seller meetings and trade fairs to improve the export options of mainly small start-up firms in BiH with limited financial background (D. PEĆANAC, pers. comm.). GTZ also promotes income generation in rural areas by diversification of the traditional systems of sustainable wild-collection of NTFPs and value addition (DUNJIC & DUERBECK, 2002). In addition, GTZ and SIPPO support the training of collectors (DUNJIC & DUERBECK, 2002). Small-scale herb cultivation and the manufacturing of herbal teas and tinctures are encouraged and financially supported by some NGOs like ECON and CARE.

In addition, a large number of further international organisations is present in BiH; however, most projects funded by international donors are not or only very indirectly environment-related. EC-funded programmes concentrate on refugee assistance, rehabilitation of housing, stimulation of economic regeneration and job creation as well as mine clearance (REC 2000b).

11.2.3 Bulgaria

In January 1999, a new National Strategy for Environmental Protection was initiated to be developed by the Ministry of Environment and Water (MoEW). This project is supported by the **PHARE programme** (TSANEVA et al. 1998). PHARE also funded the assessment of air-quality and air pollution monitoring stations in certain regions (TSANEVA et al. 1998).

The **Japanese International Cooperation Agency** has financially supported the integrated management of the environment in the 'Marisa River Basin Project' (1997-1999).

The foundation 'Bulgarian Forests' has started a programme that is supported by the European **PHARE programme**. In this programme, training courses for collectors of MAPs and other NTFPs

are organised; these courses are aimed basically at unemployed people to give them the opportunity to earn part of their living by wild-collecting medicinal and aromatic plants.

In September 2002, the Ministry of Agriculture and Forestry has signed a contract with the **World Bank** for the preparation of a forestry sector development project. This grant was made available with resources provided by the **Government of Japan**. The grant financing will help to analyse the social, environmental, economic, and financial aspects of the project. The financing will also support the preparation of studies and analyses of forest fires, protected areas, forest infrastructure, and an afforestation assessment (World Bank Sofia homepage).

11.2.4 Croatia

In Croatia, a considerable number of international NGOs are active, developing, financing and carrying out projects on environmental issues and nature conservation. One of these projects is the Karst Ecosystem Conservation (KEC), which is a co-operation between the Government of Croatia and **GEF (Global Environmental Facility)**; the project began with a grant agreement in 1999 and is based on the National Strategy and Action Plan for Biodiversity Protection. The Ministry of Environmental Protection and Physical Planning is in charge of the implementation of the KEC project. The project will contribute to the preservation of the biodiversity of the karst ecosystems of Croatia, involve as many participants as possible, be economically sustainable and harmonise with socio-economic objectives and plans of Croatia. After the project preparation, which was completed by the end of 2000 and envisaged all the activities and funds necessary for the KEC project, the project implementation was launched. This project includes five protected areas: Risnjak National Park, Northern Velebit National Park, Paklenica National Park, Plitvice Jezero National Park and Velebit Nature Park. The envisaged duration of the project implementation is 5 years (KEC web-page).

11.2.5 Romania

Since the political changes in 1989, NGOs played an increasingly important role in nature conservation in Romania; almost 200 NGOs are active in the country, today (NSAP 1996). Many of these NGOs are locally active groups; others are well known international NGOs. International financing is often secured by co-operations of national or regional NGOs with international partners. One example is the co-operation of the local 'Pro Delta' organisation, which co-operates with the Danube Delta Institute, the Danube Delta Biosphere Reserve Authorities and WWF on projects related to wetland restoration in the Danube Delta Biosphere Reserve (NSAP 1996).

The management of Retezat National Park, Piatra Craiului National Park and Vanatori Neamt Forest Park is in the hands of the Romanian State Forest Administration. As part of a pilot project on PA management, these parks are within the framework of a GEF project administered by the World Bank and co-financed by the Romanian Government and the State Forest Administration (A. BLUMER, pers. comm.).

Apart from this example, international financing is almost exclusively project related. The protected area management authorities such as the Danube Delta Biosphere Reserve Management are paid from the state budget and do usually not receive international funding for their work (G. BABOIANU, pers. comm.).

A project co-operation between the Romanian Ministry of Agriculture, Food and Forests and the **World Bank / GEF** started on biodiversity conservation in the Carpathian Mountains. The project costs are US$ 8.8 million, US$ 5.5 million of which are paid by the World Bank / GEF. The Government of Romania has a co-financing share of US$ 3.3 million.

The main objective of this project is the sustainable conservation of the biological diversity and ecological integrity of the Romanian forest and the alpine and meadow ecosystems of the Carpathian mountain chain. These include some of Europe's largest remaining stands of pristine and natural forest, Europe's largest concentration of large carnivores (brown bear, wolf and lynx, all species listed by IUCN as threatened and also strictly protected under the Bern Convention), and locally endemic flora. After project completion, the sustainability of the project will be ensured through financial support for protected areas from the central government and the 'National Regie of Forests', for capacity building at the national and local levels, and involvement of local communities and other local stakeholders in project preparation and implementation.

11.3 National Legislation

11.3.1 Albania

In 1991, the Council of Ministers established the Committee of Environmental Protection (CEP). Under the committee, several environment-related laws entered into force, local environmental agencies were founded and monitoring programmes and environmental projects were implemented. In 1998, the CEP was transformed into the National Environmental Agency (NEA), which stood directly under the authority of the Council of Ministers and had therefore more administrative and legal space for action (REC 2000a). The NEA defined the governmental strategy in the environmental field, co-ordinated environmental protection, and approved limits of pollutants and toxics. The Regional Environmental Agencies (REA) control and enforce the legal framework, follow and implement preparations for environmental permits and collect data on the status of the environment at district and at regional levels (REC 2000a). As of October 2000, the highest environmental authority in Albania is the Ministry of Environment (formerly NEA) (A. VASO, pers. comm.).

The Ministry of Agriculture and Food is responsible for the administration and protection of biodiversity. The General Directorate of Forest and Pastures (DGFP) as a part of this ministry is in charge of the management and administration of protected areas, national parks and wildlife and game hunting (REC 2000a). In co-operation with the World Bank (Forest Project) the DGFP is also developing initiatives to establish a system of certification for NTFPs (Z. DEDEJ, pers. comm.).

Despite these positive developments, there is still wide-spread ignorance of the existing laws and regulations, and implementation and enforcement have still a weak performance (REC 2000a). The negligible allocation for environmental issues in the Albanian State budget (about 0.03 % in 2000) shows that environmental protection and nature conservation are not considered important. Between 1994 and 2000, the amount spent on the environment did virtually not increase (Lek 40.3 million in 1994; Lek 53.8 million in 2000). During this period, the total Albanian State budget tripled and amounted to Lek 152 billion in 2000 (REC 2000a). There is no tradition of environmental taxation in Albania.

The Albanian National Environmental Action Plan (NEAP, 1993) identified a comprehensive link between sectoral policies and the environment as one of the priority targets of environmental legislation. This comprises a restructuring of the economy, privatisation of the public economy, development of the agriculture, transport and energy sectors and the establishment of an environmental taxation system (REC 2000a). Responsible for the NEAP implementation are, amongst others, the Ministry of Public Economy and Privatisation, The Ministry of Environment, the Ministry of Food and Agriculture, the Ministry of Health, the Ministry of Public Works and the Ministry of Transport.

Legal Framework

The basic environmental framework law ('**Law on Environmental Protection', No. 7664**, 21.03.1993) provides a legally binding requirement for all projects affecting the environment (REC 2000a). Together with the new 'Constitution of Albania' (1998) this law laid down the requirement for a sustainable development of the society, which is regarded a priority national concern, the conservation of the biological diversity of the country and the rational management of natural resources (Article 1). Its key issues are (REC 2000a):

- prevention and reduction of pollution
- sustainable management of natural resources, avoiding over-exploitation
- recording information of pollution levels
- binding provisions for carrying out the environmental impact assessment procedures (mainly Articles 9-14)

The issuing of environmental licences is required for - *inter alia* - the exploitation of flora, fauna, natural resources, coastal zones and sea bottoms (Article 18e), for opening up new areas for fruit growing in zones with protected water sources (Article 18ë). The person requesting such a licence has to present an analysis of the impact on the environment (Article 20).

The 'Law on Environmental Protection' assigns funds for the elimination of pollution sources, rehabilitation measures in ecologically damaged zones, specialist training, environmental monitoring, research projects, and other environmentally relevant purposes. This fund shall be filled with revenues from taxes and fines for non-compliance of environmental duties and injunctions (Article 50).

Special Laws

Further environment-related laws that also directly or indirectly affect the harvesting and trade of medicinal and aromatic plants (MAPs) and other non-timber forest products (NTFPs) are (REC 2000a):

- **Law on the Land and its Distribution** (Nos. 7491 and 7501; 1991; amended Nos. 7715 and 7763; 1993, No. 7855; 1994)
- **Law on the Forests and the Forest Service Police** (No. 7623; 13.10.1992)
- **Law on Plant Protection Service** (No. 7662; 1993; amended No. 8529; 1999)
- **Law On Urban Planning and Territorial Adjustment** (No. 7693, approved 06.04.1993)
- **Law on the Protection of Medicinal, Tannic Acid and Oil Bearing Plants** (No. 7722; 1993)
- **Penal Code of the Republic of Albania** (No.7895, 27.01.1995)
- **Law on Pastures and Meadows** (No. 7917; 1995)
- **Law on the Protection of Fruit Trees** (No. 7929; 1995)
- **Law on Water Resources** (No. 8093; 1996)
- **Law on Protected Areas** (No. 8906; approved 06.06.2002; no English version yet)

In addition, a large number of bylaws and regulations has been drafted and approved. Important drafts are the draft law 'On Environmental Impact Assessment' and an updated draft on environmental monitoring in Albania (REC 2000a). The latter draft law defines for the first time sets and standards of environmental indicators to describe the state of the environment.

The legal frame for MAP and other plant species protection is the '**Law on Forests and the Forest Service Police**' (No. 7623, approved 13.10.1992). The law's objectives are the administration, protection and treatment of forests in order to protect the environment and the production of timber and NTFPs. The forests' landscape value, economic function and eco-tourism have to be considered (Article 1). The administration of forests (state, municipality, private), the development and management are laid down in articles 2-20, harvesting of timber and NTFPs in articles 22-37. The gathering of 'secondary forest products' is permitted only to persons who have obtained a permit from the Forest Service; secondary forest products include – among others - needles, leaves, barks, flowers, fruits, medicinal plants (Article 33). The Forest Service is entitled to control all persons who harvest forest products and NTFPs and all vehicles that transport timber or NTFPs (Article 32). The DGFP may temporarily forbid the collection of medicinal plants in a forest estate, if these plant species are diminished or endangered (Article 36). The protection of forest estates are regulated in articles 38-53 and the organisation of the forest service in articles 54-60. The 'Forest Service Police' have a military status and the employees are equal before the law with employees of the civil police force (Article 58). The Forest Service Police are armed and their duty is to manage, organise and control preventive measures and forest protection from diseases, insects, fires, pollution and illegal cutting and grazing (Article 54).

The local forestry authorities have the right to issue licences for the collection of wild plants to legal and physical persons, according to the '**Law on the Protection of Medicinal, Tannic Acid and Oil Bearing Plants'** (Article 3). The collection of MAPs can be stopped or limited by the Ministry of Agriculture for the following and consecutive years by declaration (Article 4). Collection methods can be stipulated by the Ministry of Agriculture (Article 5).

The '**List of the Protected Species of the Albanian Flora**' (No. 20, approved 20.02.1997) is a regulation of the DGFP / Ministry of Agriculture defining the status of endangered plant species in Albania. This list has been compiled with the assistance of various scientific institutions (Z. DEDEJ, pers. comm). It comprises 307 plant species.

The main objective of the '**Law on Protected Areas**' ('Ligj per zonat mbrojtura', approved 06.06.2002) is to regulate the protection, administration and management of protected areas and their natural and biological resources, to lay down conditions for the development of eco-tourism, to inform and educate the public and to manage the economic interests of the local population, both private and public (Article 1; translation with the help of G. VILA-STEINACKER). The aim of the law, defined in Article 2, is to (1) ensure the special protection of important components of nature reserves and biodiversity through the creation of protected areas, (2) ensure the protection of natural habitats, different types of reserves and natural landscapes and (3) to define the criteria for six different categories of protection. 'Environmental Permits' are defined in article 3p; they are issued by the environmental authorities for economic and social activities that may have an impact on the environment as defined by the 'Law on Environmental Protection'. The areas and ecosystems chosen to be categorised as protected areas should be characteristic habitats and landscapes representative of the country (Article 3q). The different categories (I: Strict Reserve; II: National Park; III: Natural Monument; IV: Managed Nature Reserve; V: Protected Landscape; VI: Protected Zones with Manageable Resources) are defined in article 4 and described in articles 5-13. Among other activities, it is forbidden in Strict Reserves (Article 5) to cut trees and shrubs (5a). In national parks, the distribution of non-native species is prohibited if they pose a threat to native species (Article 6b) as is the plantation of monocultural forests (Article 6ë). The administration of the national park can agree to the gathering of plants, fruits, seeds and mushrooms in the protected area (Article 7, Sent. 4g). 'Protected Zones with Manageable Resources' are defined as wide zones that are relatively isolated, not or only scarcely inhabited, difficult to enter, but which are under considerable pressure to become more populated and more widely used and threatened (Article 11).

The declaration and management of protected areas is regulated in articles 14 and 15, the management plan for protected areas in articles 16-18. PA managers are obliged to prepare management plans for their protected areas (Article 16). Articles 19-21 refer to the property in and users of protected areas. Legal or physical persons who undertake activities in protected areas are obliged to have a contract with the PA management and to pay the respective fees (Article 20, Sent. 7). Monitoring of protected zones (under the responsibility of the Ministry of Environment) is regulated in article 22. The administration of PAs and the rights to visit protected areas are laid down in articles 25 and 26. The network of protected areas, its development and management are defined in articles 28-30. An

ecological network will be created in Albania in order to maintain or change the favourable status of protection of ecosystems and habitats (Article 31). Core zones, corridors, restoration zones and buffer zones, their planning and management are defined in articles 32 and 33. Article 34 lays down the sanctions to be imposed on offenders against the dispositions of the law. In detail, these are defined by the Law on Environmental Protection (No. 7664, 21.03.1993), the Law on Forest Service and Forest Service Police (No. 7623, 13.10.1992), the Law on Urban Planning And Territorial Adjustment (No. 7693, 06.04.1993), the Law on Administrative Offences (No. 7697, 07.04.1993) and the Penal Code of the Republic of Albania (No.7895, 27.01.1995) (Article 34).

The legal and institutional framework in environmental issues, particularly if related to nature protection and biodiversity, is still not adequately developed (REC 2000a). Responsibilities occasionally overlap and there are legal contradictions and corruption of the judicial system; hence environmental law implementation has been weak (Z. DEDEJ, pers. comm.). In cases of non-compliance with the law, sanctions are rarely imposed and the collection of fines is low. In order to protect the environment, consequent law enforcement seems to be the most important step to take (REC 2000a).

The Albanian Constitution (approved in 1998) clearly defines the environmental protection and its steady development as one of the main objectives of Albania in the future, but the institutional enforcement is still far from achieving this objective (A. VASO, pers. comm.).

11.3.2 Bosnia-Herzegovina

Until the early 1990s, only few regulations and laws on environmental issues existed in the former Yugoslavia. The establishment of protected areas in BiH was based mainly on the 'Law on Protection of Nature' (1970) and the 'Law on Protection of Cultural, Historical and Natural Heritage' (REC 2000b). After the war and the establishment of two entities (FBiH and RS) on the territory of the new state of Bosnia-Herzegovina, the legal system changed. The protection, preservation and promotion of the environment is under the authority of the entities, not of the state of BiH. Various obstacles have since prevented the approval of a satisfactory environmental legislation (REC 2000b):

- inadequate co-operation between the two entities
- inadequate institutional framework and capacity for the implementation of legislation
- ineffective co-ordination between various sectors, at local and national levels
- poor social and economic conditions in BiH, slow process of privatisation

Experts say, that a major problem in BiH is the disrespect for institutional authority, and a certain culture of lawlessness, corruption and mafia-style gangsterism which has pervaded the BiH society since the war (REC 2000b).

Following the extended EU-accession process, efforts are presently undertaken to harmonise BiH legislation with EU legislation (D. PEĆANAC, pers. comm.). Because of quality requirements of the buyers, EU regulations and 'good practices' guidelines for food, cosmetic and pharmaceutical uses are under implementation in BiH (D. PEĆANAC, pers. comm.).

The Ministry of Physical Planning and Environment (in FBiH) and the Ministry of Urbanisation, Physical Planning, Construction and Environment (in RS) are responsible for environmental issues. The co-operation between these two ministries is co-ordinated by the Water Steering Committee (WSC) and the Environmental Steering Committee (ESC) (REC 2000b). Within FBiH, the federation and the cantons have – in theory – joint responsibilities for environmental issues (Article 3, Sent. 2c of the **Constitution of Bosnia and Herzegovina**, DPA, 14.12.1995). The federation can, however, delegate responsibilities to the cantons, if appropriate (REC 2000b). Each of the 10 cantons has its own constitution and government (Constitution of the Federation of Bosnia and Herzegovina, Section V(1), Article 4). All constitutions provide the possibility of establishing a council of cantons to harmonise policies and activities of federal interest; they can transfer their responsibility for the environment to the municipalities or to the federation (REC 2000b). The development of a National Environmental Action Plan (NEAP) was recently started in order to provide a long-term environmental perspective for the whole country by defining environmental priorities, assisting environmental officials and providing help in the process of law drafting, policy development and institutional building (REC 2000b). In both entities, a new environmental protection law is being drafted; however, both entities have agreed not to press for its adoption but to await the legislation to be prepared under the EC Project 'Preparation of Environmental Law and Policy in BiH' (REC 2000b).

Environmental research and monitoring activities are carried out by the Agricultural Research Institute in Banjaluka (RS), CETRES, University of Sarajevo (FBiH) and the Faculty of Agriculture, University of Mostar (FBiH) (KUPKE et al. 2000; SEED HQ 2000).

Legal Framework

BiH's legislative process is slow, as the responsibilities for establishing and enforcing a judicial system were put into the hands of the entities. Access to justice for environmental concerns (for both citizens and companies) stops at the entities' borders as if another state were entered (REC 2000b). In BiH there is no law on state level regulating the wild-harvesting and trade in medicinal and aromatic plants (D. PEĆANAC, pers. comm.). Therefore, the legal framework has to be observed at entity level:

Federation of Bosnia and Herzegovina

The **Constitution of the Federation of Bosnia and Herzegovina** was enacted on March 30, 1994, adopted after the DPA (June 24, 1996) and amended several times thereafter. Unlike in the old constitution of the Socialist Federal Republic of Yugoslavia, no explicit rights of the individual to a healthy environment or to free access to information are mentioned. Both the Federation Government and the Cantons have the responsibility for environmental policy (Section III, Article 2c). Section III, Article 4(f) regulates that the cantons have the exclusive responsibility for 'regulation of local land use, including by zoning' (REC 2000b). Each canton may confer its responsibilities to a municipality or city in its territory, or to the federal authority (Section V, Article 2, Sent. 1). The only FBiH canton that has already its own environmental law is the Canton of Tuzla (REC 2000b).

It is important to note, that according to Annex 2 of the Dayton Accords, all laws from the former Socialist Republic of Bosnia and Herzegovina remain transitionally in force under the provision that they are not inconsistent with the Dayton Constitution. In terms of the environment, this provision is important, because amongst others the old **Law on Urban Planning** (1987) has remained in force in the FBiH (REC 2000b).

The '**Law on Forests'** of FBiH (No. 01-3-02-3-19/02, approved 20.05.2002) regulates the preservation and protection of forests, strengthening their ecological functions, planning and administration, the economic functions and financing regeneration in FBiH and supervision of forests and sanction for offences (Article 1). The forest and forestland shall represent basic natural resources whose values shall be manifested through ecological, social and production functions of the forests (Article 1). 'Forestland' includes also fallow land, under-utilised land and unproductive land outside the forest, in cases where these lands support the functions of the adjoining forest (Article 2). Deforestation is regulated in articles 4 and 5. Deforestation is forbidden except 'if it results in greater permanent benefits and if no harmful consequences for the environment are expected' (Article 4). Secondary forest products (Medicinal and aromatic plants (MAPs), mushrooms, forest fruits, berries and others) may be cultivated and used by the Cantonal Forestry Management Company. This company may also allow the utilisation of secondary forest products to other legal and physical persons in compliance with forest management plans (Article 9). The conditions for cultivation and gathering of secondary forest products shall be prescribed by the Federation Minister (Article 9). It shall be forbidden to 'cut, to uproot or in any way damage trees of *Picea omorika* (Pancic) Purk., *Taxus baccata* L., *Corylus colurna* L., *Acer heldenreichii* Orph., *Pinus mugo* Tura, *Alnus viridis* (Chaix) Lam. & DC, *Pinus heldenreichii* Christ., and *Petteria ramentacea* (Sieber) Presl on their natural sites unless sanitary or tending felling is needed' (Article 10). The forestry programme and management plans are regulated in articles 17-43. Forest guards are entitled to temporarily seize timber and secondary forest products illegally transported (Article 37). For protection or management regime purposes, certain forests may be declared 'protection forests' or 'special purpose forests' (Article 38). The ownership of forests is regulated in articles 44-55, the forestry institutions in articles 56-59 and financing in articles 60-62. The 'Funds for Enhancement of the Federation and Cantons of the Forests' shall generate income by (1) compensation for the benefit of general welfare functions of the forest, (2) funds for the extended biological reproduction of the forest, (3) compensations according to the law and (4) grants, credits, gifts and other sources (Article 60). This fund shall finance, among others, scientific research, afforestation of karst and other bare lands, forest production and silviculture measures (Article 61). Supervision is regulated in articles 63-68 and penalty provisions in articles 69-72. Persons illegally collecting secondary forest products shall be liable to a fine of KM 5,000 to KM 25,000 (Article 69).

A '**Law on Protection of Nature**' in the FBiH has been drafted (REC 2000b; D. PEĆANAC, pers. comm.). This law will, amongst other regulations, define a 'Red List of Protected Plant Species', which are forbidden to collect, cut, extract or damage in their natural environment. Also keeping, transportation and sale of these species shall be prohibited (Draft Version of the 'Law on Protection of Nature', FBiH, No. 03-02-787/2002, Article 34) (D. PEĆANAC, pers. comm.).

Further regulations directly or indirectly relating to medicinal and aromatic plants and protected areas in FBiH are, among others:
The '**Law on the Establishment of Blidinje Nature Park**' (No. P-UK-074/95; Hrvatska Republika Herzeg-Bosna) contains regulations of Blidinje Nature Park.
The **Law on Agricultural Land** (No. 01-10/98, adopted 08.01.1998)

Republika Srpska

The **Constitution of the Republika Srpska** was adopted in November 1994 and has been amended several times since (REC 2000b). As a unitary state, local administration is restricted to municipalities. Environmental protection lies within the responsibility of the entity (Article 68); Unlike in FBiH constitutional legislation, citizens in RS have an individual right to a healthy environment (Article 35). In addition, 'every person shall be bound, in accordance with the law and his/her own capabilities, to protect and improve the environment' (Article 35). Natural resources determined by law to be of general interest shall be state-owned; the use and the exploitation of property significant for the protection of nature or the environment may be restricted under a full compensation to the owner (Article 59). In addition, the Republika Srpska shall protect and encourage the rational use of natural resources with the view of protecting and improving the quality of life and protecting and reviving the environment for the general benefit (Article 64). Specific needs of citizens in relation to environmental protection are taken care of by the municipalities in accordance with RS law (Article 102, Sent. 5).

The '**Law on Forests'** in RS (No. 01 – 1072/94, approved 08.06.1994) states that forests are of general interest and have to be preserved, used and re-cultivated in a way such that their economic functions are not endangered and that the production is guaranteed over the long term (Article 1; translation with the help of L. BAKOVIĆ). Article 4 lays down that forests are under the administration of the Republika Srpska, managed by the forest service 'Srpske Shume' (Serbian Woods) and by the Armed Forces of the Republika Srpska, in accordance with the law. Financial means for primary reproduction of forests have to be provided by the administrative authorities; these means are sourced from the total income and have to be at least 1 % of the revenues gained from the sale of timber, sold at market prices (Article 37). This finance has to be used in the area where it has been gained and cannot be transferred to other forest areas (Article 37). Amongst other purposes, these finances are used for melioration, reforestation and forest protection, to fight plant diseases and to protect the forests from illegal use (Article 38). Persons who are economically active in RS forests have to pay a compensation of 0.1 % of the total income to the Ministry of Agriculture, Forests and Water (Article 41). These financial means have to be re-invested in the re-generation of forests, the protection from erosion or other protective measures (Article 42). The law prohibits the cutting of *Picea omorika*, *Taxus baccata*, *Petteria ramentacea* and other valuable species (Article 58). Cattle grazing, cutting of branches and the collection of moss and lichens in state forests is prohibited (Article 59). MAP species protected and prohibited to collect are not explicitly mentioned. Forest inspection is mainly regulated in articles 85-88. Forest inspectors are, among other provisions, entitled to confiscate timber cut illegally, other illegally produced or harvested forest products and tools with which such illegal activities have been carried out (Article 86, Sent. 8).

The '**Law on national parks**' in RS (No. 01-1171/96, approved 23.08.1996) states that areas with special characteristics, which form areas of ecological, scientific, cultural and historical natural units are regarded as items of general interest and put under the protection of the state as national parks (Article 1). The development and protection of the national park has to be in accordance with the land utilisation plan (Article 4). The use depends on the category of protection (I-III) of a special area within a national park (Article 6). It is prohibited to cut trees or shrubs or destroy the vegetation (except for sanitary cuttings) if the natural balance is in danger (Article 7, Sent. 1). In addition, the uncontrolled collection of medicinal and aromatic plants, mushrooms and fruits is prohibited within national parks (Article 7, Sent. 3). The income of the parks for development and administration purposes is gained from (1) the payment for work and services carried out on the national territory, (2) the RS budget, and (3) other sources in compliance with the law (Article 12). National park inspectors are entitled to control persons, inspect vehicles and roads, inspect apartments after a warrant is issued, to collect fines and to temporarily seize objects. Suspects have to be delivered to the police (Articles 15). The Ministry of Environment, Forests and Water, the Ministry of Education, Science and Culture and the Ministry of Urbanisation and Town-Planning are responsible for park supervision (Article 21). Sanctions to be paid for violations of the law are regulated in articles 23-25; these sanctions comprise, *inter alia*, illegal cutting and the introduction of invasive species (Article 24).

The '**Law on Medicinal Products**' (No. 01-458/01; adopted 25.04.2001) defines medicinal products, trials, and the conditions required to obtain approval for the authorisation of marketing, production, trade, quality control, advertising, information and surveillance on medicinal products in RS (Article 1). It includes products of human, animal, herbal and chemical origins (Article 3). Herbal products are for external or internal application, to be used to alleviate complaints and to normalise single physiological functions (Article 4). 'Good practices' guidelines applicable are listed in article 9. The investigation of medicinal products is laid down in articles 19-31. These investigations include, among others, the control and documentation of the starting material and quality and quantity data on the contents (Article 25). Conditions for approval to place the product on the market are laid down in articles 32-47, production in articles 48-52, trade in articles 53-70 and quality control in articles 71-81. Supervision and penalties are regulated in articles 85-94.

State level and laws in preparation

According to REC-information (REC 2000b), the '**Law on Physical Planning'** is valid in both entities. Although it could not be obtained, this law is said to contain regulations relating to forests and other vegetation, agricultural land of high value or specific use, areas endangered by floods or erosion, karst, flatlands, degraded forests and soils and endangered areas that require special protection (REC 2000b). Further instructions on protection and usage of forests are found in the '**Law on Agriculture'** (FBiH) and the '**Law on Organic Agriculture'** (RS). The latter already exists as a draft version, but it is not yet available (V. CORLUKA, Ministry of Agriculture and D. PEĆANAC, pers. comm.); it will be discussed in parliament in the near future. The 'Law on Organic Agriculture' may also include regulations on MAP cultivation and trade of cultivated MAP raw material, which has not hitherto been regulated (D. PEĆANAC, pers. comm.).

In addition, the '**Regulation on Herbal Medicinal Products'** is in preparation; it is available as a draft version, and will be presented in the first reading in parliament in November 2002 (R. BAHTIJAREVIC (GTZ expert for legislation), and D. PEĆANAC, pers. comm.). In this draft version, 'herbal medicinal products' are defined as medicinal products made of medicinal and aromatic plants (MAPs) and other natural raw materials intended for external or internal use to alleviate complaints and to normalise single physiological functions. No herbal medicinal products are, according to this draft version, products with vitamins, minerals, or active chemical substances added, products with active substances obtained through bio-technologic production, products containing poisons and homeopathic products.

In neither of the entities does a legal framework for environmental licensing exist (REC 2000b). In early 2002, a working group was established in Bosnia-Herzegovina in order to establish a certification body at state level. This certification body will also develop a certification system for medicinal and aromatic plants and other NTFPs. So far, the working group is still in the stage of developing and strengthening their activities (D. PEĆANAC, pers. comm.). In addition, some international certification bodies are active in BiH (cf. section 7.3).

Taxation

There are not many economic or taxation instruments to finance environmental issues in BiH, except for a small water-fee. No environmental charges or taxes on fertilisers, pesticides or other chemical agents used in agriculture or on land-use with environmental impacts are raised in BiH (REC 2000b). However, the '**Law on Physical Planning'** regulates, that polluters have to pay proportional pollution protection costs; the law prescribes -*inter alia*- taxes in cases where agricultural or other land, forests or vegetation cover, coastal areas, lakes and rivers are endangered by harmful substances (REC 2000b).

Meanwhile, however, a legal framework has been provided in both RS and FBiH ('Forestry Law'/'Forest Law'), to collect fees for wild-harvesting of NTFPs. The laws have still to be implemented effectively. An evaluation of the income generating effects was planned during the 'Seller/Buyer Meeting' in November 2002 (D. PEĆANAC, pers. comm.).

The problem with regulations on MAP collection, trade and taxation is, that both the legislation on agriculture, forestry and pharmacy have to be taken into account. The 'Law on Forestry' in RS determines that trade companies have to pay 10 % of the income derived from the sale of secondary forest products to the Forest Company 'Srpske Sume' in order to provide funding for 'revitalisation' ('Law on Forestry' in RS, Article 52, Paragraph 5). In FBiH, companies have to pay a compensation of no less than 3 % of the income derived from the sale of secondary forest products ('Law on Forestry' in FBiH, Article 69, Paragraph 3). In practice, however, companies usually do not pay these taxes (D. PEĆANAC, pers. comm., obtained from various companies in RS and FBiH), hence this tax is theoretical only, as the regulations are very rarely implemented.

11.3.3 Bulgaria

Bulgaria is a parliamentary republic with a central government, legislation and a state constitution ('**Constitution of the Republic of Bulgaria**', SJ No. 56, 1991). Since 1999, the country is divided into 28 regions, administered by regional governors appointed by the Bulgarian Council of Ministers. The regional governments are responsible for the implementation of state policy and the protection of state interests and legislation (TSANEVA et al. 1998). There is no separate regional legislation. Environmental issues and the sustainable use of natural resources is also under the regional governors' responsibility, but it can be devolved to the municipalities concerned in cases of local importance (TSANEVA et al. 1998). Municipalities also have the opportunity to apply the Environmental Impact Assessment (EIA) procedure as a preventive measure against environmental pollution (TSANEVA et al. 1998). Municipalities in Bulgaria form regional associations as well as a National Association of Municipalities ('**Law on Administrative-Territorial Structure of the Republic of Bulgaria**', SJ No. 63, 1995 and '**Law on Local Self-Governance and Local Administration**', SJ No. 77, 1991; amended Nos. 24; 49; 65, 1995).

The municipalities are juridical bodies with property rights and an independent budget, which is sourced from revenues from local taxes, local fees, revenues from concessions, fines and others. Further funds are sourced from state revenues, subventions from the state budget, debt capital funds and special funds such as the Municipal Environmental Fund, the Privatisation Fund, the Housing Construction Fund and others (TSANEVA et al. 1998).

Bulgaria has a relatively elaborate environmental legislation. In recent years, the country has entered a process of adopting new legal acts in all aspects of environmental policy in order to harmonise its legislation with EU legislation. The new 'Water Law', for example, which was approved by the Council of Ministers in January 1999, incorporates all major EU directives related to water management (TSANEVA et al. 1998).

Legal Framework

The central legal act relating to the environment is the '**Law on Environmental Protection**', adopted in October 1991 (SJ No. 86, 1991; amended No. 90, 1991; No. 100, 1992; Nos. 31; 63, 1995; Nos. 13; 85; 86, 1997). This law gives the framework, which has to be further defined by separate legislation in specific sectors. The central aims are to (Article 1):

- obtain and furnish information concerning the state of the environment
- control the state of the environment
- assess impacts on the environment
- plan and implement environmental protection activities
- lay down rights and duties of central and local authorities, corporate bodies and physical persons with regard to environment protection

The 'Law on Environmental Protection' regulates the responsibilities of the municipalities. Among these responsibilities (Articles 24-28) are (TSANEVA et al. 1998):

- collection and dissemination of information as to possible consequences for human health and the environment and citizen conduct in case of any expected negative influences
- creation of own programmes for environmental protection in co-operation with other government authorities
- information of the public about the state of the environment and about activities and actions subject to EIA
- management of municipal environmental protection funds
- establishment of voluntary eco-inspectors to control and impose administrative penalties (there is no information about whether this actually happens)

Special Laws

The special laws directly or indirectly relevant to medicinal and aromatic plants and protected areas include, among others:

- the '**Law on the Territorial and Town Planning**' (SJ No. 29, 1973; amended Nos. 31; 32, 1990; No. 15, 1991; No. 63, 1995; No. 104, 1996).
- the '**Law on the Cleanliness of the Atmospheric Air**' (SJ No. 45, adopted May 15, 1996; amended No. 49, 1996; No. 85, 1997)
- the '**Law on Local Taxes and Fees'** (SJ No. 117, 1997)
- the '**Administrative Violations and Sanctions Act**' (SJ No. 92, 1969)
- the '**Law on Medicinal Plants'** ('Medicinal Plants Act', SJ No. 29, 07.04.2000)
- the '**Law on Forests'** ('Forestry Act', SJ No. 89, 1958; amended in 1968, 1977, 1979, 1994 and 2000)
- the '**Law on Nature Protection**' ('Nature Protection Act', SJ No. 47, 1967; amended in 1977, 1978, 1982, 1991 and 1995)
- the '**Law on Protected Areas'** ('Act for Protected Areas', adopted October 20, 1998; effective November 15, 1998)
- and the '**Law on Biodiversity'** ('Act for Biodiversity', 09.08.2002)
- the '**Regulation on the Control of Raw Materials and Products of Vegetable Origin**' (SJ No. 60, adopted 13.07.1993)
- the 'Regulations No. 1 on Environmental Impact Assessment of projects, sites and activities, not due to obligatory Environmental Impact Assessment' (SJ No. 13, 1998)
- the 'Regulations No. 4 on Environmental Impact Assessment' (SJ No. 84, 1998)
- the 'Tariff for the fees collected by the municipalities for the environmental impact assessment of projects, sites and activities, not due to obligatory environmental impact assessment' (SJ No. 13, 1998)

The '**Protected Areas Law**' defines the categories of protected areas, their purpose, regime of protection, use declaration and management (Article 1). The aim is to preserve these areas as a national or general human wealth, conducive to the development of culture and science, and the welfare of society (Article 2). Defined categories are (1) strict nature reserve, (2) national park, (3) natural monument, (4) managed reserve, (5) nature park, and (6) protected site (Article 5). Protected

areas become exclusive state property and fall under the jurisdiction of the MoEW (Article 8; cf. Constitution of Bulgaria, Article 18). The law requires municipalities (as owners of forests, lands and aquatic areas within protected areas) to exercise responsibility for their management and maintenance, establish a management body for the national park (Articles 46-54) and develop a management plan (Articles 55-66). The municipalities are responsible for guarding the parks (Articles 67-73) under the provision of this and other relevant laws. Responsible authorities to administer and manage activities within protected areas are: the Ministry of the Environment and Waters (MoEW), the Regional Inspectorate of Environment and Waters (RIEW) and the national park directorates.

However, the law does not include provisions for buffer zones to be established in protected areas and does not clearly regulate by whom nature parks (Cat. V) will be managed (TSANEVA et al. 1998).

The '**Law on Nature Protection**' - effective since August 2002 - lays, among other provisions, down that the natural landscape, typical of separate regions, remarkable for its special beauty or representing a characteristic environment is subject to protection and preservation (Article 10). The collection of medicinal herbs, forest fruits, mushrooms and seeds shall not be allowed in quantities and methods leading to their extinction or hampering their reproduction (Article 9). Species of valuable medicinal herbs, forest fruits and other plant species are set under a special regime of preservation and cultivation. The picking of flowers on sites for hiking and tourism and in resorts is forbidden (Article 9). The law provides a list of 670 species, 69 of which are regarded as medicinal or aromatic plants (L. EVSTATIEVA, pers. comm.; see also Appendix D.2).

The '**Law on Forests'** defines that all land comprising the national forest stock is public property (Article 1). The national forest stock encompasses all forests including 'glades, pastures, cuttings, rocks, moraines, lakes, burnt out areas, barrens and screes within the boundary thereof' (Article 3). The forests are divided into industrial purpose forests (timber production) and special purpose forests (protective forests, resort forests, forest reserves and others) (Article 5). The Ministry of Forests and Forestry is in charge of forest management (Article 10). The direct management of the national forests shall be exercised by the forest-range administrations who are the local authorities of the forestry department (Article 12). The national forest stock shall be managed and used on the basis of the state economic plan aimed at raising the forest productivity, meeting the demands of the national economy in timber and enhancing the water protection, protective, anti-erosion, sanitary and decorative functions of forests (Article 16). The collection of medicinal and aromatic plants, along with domestic animal grazing and the gathering of fruits, seeds, mushrooms and other products, is defined as 'incidental use of forests' and as such shall be permitted by the forest-range administration (Article 27).

The conservation and protection of the national forest stock covers (Article 35):

- protection from illegal cutting from pasture and other violations
- fire protection
- protection of the forests from diseases, insects and other pests

Sanctions are regulated in Articles 42-68.

The '**Law on Medicinal Plants'**, effective since April 2000, defines the plants that may be collected, the rules for issuing quotas, licence taxes, cultivation and other details related to the collection and sustainable use of medicinal and aromatic plants (MAPs) (P. ZHELEV, pers. comm.). The law provides a list of 740 plant species that are or can be used as medicinal or aromatic plants and grow on Bulgarian territory.

There is no certification system for MAPs and other NTFPs operating in Bulgaria. However, this topic is considered within the framework of the Project for Forest Certification (P. ZHELEV, pers. comm.).

Law Implementation and Control

National and regional administrative authorities are responsible for law implementation. These authorities include the Regional Forestry Service and the Regional Inspectorates of Environmental Protection (P. ZHELEV, pers. comm.). They carry out regular controls to find out if the rules are being obeyed by collectors and traders. Implementation seems to be basically effective, but problems with collecting of endangered and rare plant species are reported (P. ZHELEV, pers. comm.).

The trade in MAPs is controlled by the Federal Government. The Ministry of Environment and Water annually issues quotas for certain species in defined regions. The quotas must not be exceeded. Compliance with the quotas is controlled by the regional subdivisions of the Ministry of Environment and Water and by the Ministry of Agriculture and Forests (P. ZHELEV, pers. comm.).

A National System for Environmental Monitoring was developed in 1994. These monitoring activities encompass control and protection of waters, soil and land, natural ecosystems and protected areas, biological and microbiological monitoring and others. The environmental information is recorded, maintained and administered by the National Center on Environment and Sustainable Development (NCESD). On request, this information can be made available to municipalities and to the public (TSANEVA et al. 1998). MAP collection and trade monitoring is part of the responsibility of the Ministry of Environment and Water. The data are approximations and include the species-specific quantities collected in the regions where the subdivisions of the ministry are located (P. ZHELEV, pers. comm.). The monitoring system is reported to be reliable in most cases (P. ZHELEV, pers. comm.).

11.3.4 Croatia

After the new political independence of the country from the former Yugoslavia, Croatia has – mainly during the last 5-7 years – considerably improved its national legislation related to the environment and the use of natural resources.

Legal Framework

The general legal frame for nature conservation and environmental protection has been created by the '**Law on Environmental Protection**' (No. 82/94 and No. 128/99). The basic aims of the law are (Article 2):

- the permanent preservation of the primary state and biodiversity of natural communities and the preservation of environmental stability
- the preservation of quality of animate and inanimate nature
- the rational use of nature and its resources
- the preservation and restoration of cultural and aesthetic landscape values
- the promotion of the environmental state and ensuring of better living conditions

The means to achieve these goals are, among others, preventing environmental risks, encouraging the use of renewable natural resources and energy, restoring damaged parts of the environment, raising awareness for the needs of environmental protection and a co-ordination between environmental protection and economic development (Article 3). The basic environmental protection principles are defined in articles 11-17. Environmental protection documents include the Environmental Protection Strategy (Article 18), Environmental Protection Programmes (Article 19-21) and the Environmental State Report (Article 22). The Environmental Impact Assessment is described in articles 25-32. Environmental state monitoring (articles 35-39) is determined by the Environmental Protection Strategy or by international agreements and it is guaranteed and financed by the State (Article 35). The liability for environmental pollution is laid down in articles 50-59. The State Directorate for the Protection of Nature and Environment has the administrative control over the implementation of the provisions of this law (Article 61).

Special Laws

There is no law or other legal instrument that directly refers to the wild-collection of medicinal and aromatic plants in Croatia (Z. ŠATOVIĆ, pers. comm.) However, a number of laws, by-laws and other regulations within the framework of the Law on Nature Protection directly or indirectly affect medicinal and aromatic plants (MAPs); many of these laws define a special protected area (for a complete list of the laws referring to PAs cf. Appendix E). Some laws are basic laws of the former Yugoslavia, which are still valid in Croatia until they will be replaced by new regulations (Ministry of Environmental Protection and Physical Planning; Internet information, August 2002). The most important of these laws and legal instruments are:

- The **Law on Nature Protection** (No. 30/94 and No. 72/94)
- The **Law on Air Quality Protection** (No. 48/95)
- The **Environmental Protection Emergency Plan** (No. 82/99 and No. 86/99)
- The **National Environmental Action Plan** (NEAP) (No. 46/02)
- The **By-Law on Environmental Impact Assessment** (No. 34/97 and No. 37/97)
- The **By-Law on Environmental Information System** (No. 74/99 and No. 79/99)
- The **Rule Book on Environmental Inspector's Official Identification** (No. 79/95)
- The **Rule Book on Environmental Emission Inventory** (No. 36/96)
- The **Rule Book on Environmental Label** (No. 64/96)
- The **Rule Book on Protection of Fungi** (No. 115/98)
- The **Rule Book on Collecting Plants in the Wild** (in preparation)
- The **Law on Proclamation of Velebit Mountain a Nature Park** (No. 24/81)

- The **Law on Proclamation of Plitvice Lakes a National Park** (No. 29/49, No. 34/65, No. 13/97)

The most important law relevant for the wild-collection of medicinal and aromatic plants in Croatia is the '**Law on Nature Protection**' (No. 30/94 and No. 72/94). The protection of nature shall be, among other aspects, implemented by (Article 2):

- defining parts of the animate and inanimate nature that enjoy special protection of the Republic of Croatia
- ensuring the rational use of nature and its resources without significantly damaging or degrading it
- ensuring optimal conditions for nature's sustainability and unrestrained progress

Parts of nature with special protection are national parks, parks of nature, strict reserves, special reserves, park-forests, protected landscapes, nature monuments, park architecture monuments and individual plant and animal species (Article 3). These different categories are defined and described in detail in articles 4-12. With reference to rare and endangered species, any action that would interfere with the natural life cycle and growth of a plant or an animal is prohibited; this includes picking, removing from the habitat, hiding, selling and purchasing of the respective plant species (Article 12). National parks and nature parks are managed by public institutions to be founded by the Croatian Government (Article 17). These parks are usually transferred into the ownership of the State (Article 40). Activities of these public institutions, however, have to be non-profit oriented (Article 18). Protection methods are described in articles 28-42. The protection, maintenance, promotion and use of national parks and nature parks have to be regulated in physical plans (Article 28). Article 36 of this law regulates that the Ministry of Environmental Protection and Physical Planning is responsible for issuing approvals for the wild-harvesting of medicinal and aromatic plants (and parts of these plants) that are not specifically protected by the law, if this collection is done for processing, commercial or trading purposes. Control and inspection is laid down in articles 46-51 and penalties for non-compliance with the law in articles 52-54.

At the sub-legislative level, Croatia has a '**Red Data Book of Plant Taxa'** currently listing 401 species; a '**Rule Book on Collecting Plants in the Wild**' based on the Red Data Book is in preparation (Z. ŠATOVIĆ, pers. comm.). Until this rule book is published, there are no legal means to directly control and monitor the wild-collection of medicinal and aromatic plants (A. STRBENAC, pers. comm.). However, the Ministry of Environmental Protection and Physical Planning issues annual quotas for certain MAP species (cf. chapter 7.4).

There is no specific legislation on the cultivation of medicinal and aromatic plants in Croatia.

11.3.5 Romania

Legal Framework

The most important Romanian laws and regulations with reference to nature conservation and use of and trade in wild flora and fauna are (A. BLUMER and Gh. COLDEA, pers. comm.):

- The '**Law No. 137/1995**', '**Environment Protection Act**'; amended 17.02.2000 (MO No. 70/2000)
- The '**Law No. 5/2000**', '**Law on Protected Areas**', approved 06.03.2000, approving the National Plan for Land Use, Section III

The '**Environmental Protection Act**' is, *inter alia*, based on the principles of (Article 3):

- the prevention of ecological hazards and damage
- the preservation of biodiversity
- 'polluter pays'
- the creation of a national system for integrated environmental monitoring
- sustainable utilisation
- development of international co-operation in ensuring environmental quality

The strategic elements and principles of this law are to be implemented by means of environmental impact assessment procedures, the drawing up of standards and their co-ordination with international regulations and the co-ordination of environmental planning with land-use and town-planning (Article 4). The right of all persons to a healthy environment and to information on environmental quality shall be guaranteed (Article 5). Articles 8-33 refer to the economic and social activities having an impact on the environment. The protection of natural resources and the preservation of biodiversity are regulated in articles 34-63 (the protection of the soil, subsoil, and terrestrial ecosystems in articles 47-53, the protected areas and natural monuments in articles 54-59). Management authorities, powers and responsibilities are defined in articles 64-80, penalties of non-compliance with the law in articles 81-86. The Central Environmental Protection Authority has, among other tasks, to develop and promote the national environmental strategy for sustainable development and to monitor the implementation of this law (Article 64).

The '**Law on Protected Areas**' regulates the protected areas, conservation of natural habitats and of wild fauna and flora in Romania (MURARIU 2002).

Areas protected as 'national parks' have to be a characteristic example of natural regions, or landscapes of outstanding beauty with a considerable variety of wild fauna and flora, habitats or geomorphological specialities, which are especially important for science, education, recreation and tourism (Articles 1-7). The law provides in its annex a detailed list of protected areas in Romania.

Special Laws

A number of further laws, regulations and instructions are directly or indirectly related to medicinal and aromatic plants. The most important of these regulations are:

- The '**Law No. 462/2001**' (approved 02.08.2001) approving the Ministry Ordinance MO No. 236/2000 and providing the legal frame for protected areas, natural habitats and wildlife conservation

- The '**Order No. 647/2001**' (approved 06.07.2001) of the Ministry of Environment, regarding the procedure for the collection, capturing and trading on the domestic and international market of wild flora and fauna

The '**Order No. 647/2001**' regulates the collection, hunting, purchase and trade at the national and international market of species of wild fauna and flora in Romania, listed in the appendix of the law (Article 1). Among others, this refers to medicinal and aromatic plants, food plants, plants used for tanning and decoration purposes, either as whole plants or their rhizomes, tubers, branches, bark, flowers, leaves, fruits, seeds or buds thereof, in fresh or semi-processed condition (Article 1a). Physical persons collecting such plants or parts thereof in order to trade them on the domestic or international markets must obtain a licence for the collection and trade from the environmental inspectorate of the district where the collection takes place (Article 3). Environmental permits are issued according to evaluation studies on the state of biological resources; these studies are carried out annually and upon request by scientific institutions and are subject to the technical expertise of the Romanian Academy (Article 6, Sent. 2). The studies specify the maximal annual collection quota, especially for those species harvested in large quantities or being endangered or growing in areas for which the Ministry of Environment has to pronounce periodic harvesting restrictions to guarantee the natural capacity of regeneration of these species and resources (Article 6, Sent. 4). Licences are valid for one year (Article 6, Sent. 5). The licences contain the conditions and restrictions for collection in compliance with technical standards regulating the collection of natural resources and with regulations related to habitat and biodiversity protection (Article 7).

Other detailed regulations directly related to medicinal and aromatic plants (MAPs) or endangered plant species are found in subordinate laws. The '**Law No. 69/1994**' contains an agreement concerning the international trade with endangered species of wild fauna and flora in Romania (MURARIU 2002). The '**Law No. 31/2000**' lays down that the collection of medicinal plants for commercial purposes from the national forest or other forests without the agreement of the Forestry Units or of the owner is forbidden (Article 2). A quantity of collected medicinal and aromatic plants of less than three kilogrammes is not considered a collection 'for commercial purpose', but for family needs. At present, the Romanian Parliament is debating an act on the 'rules applicable to the use of medicinal, aromatic, toxic and drug plants' (MURARIU 2002).

The '**Government Decree No. 143/1999**' defines that the goal of the National Company PLAFAR is defined as to enforce the national strategy for collecting and cultivating MAP species (Article 4).

Environmental legislation is a relatively new issue in Romania and its implementation is still weak in many cases. Responsibilities of law enforcement are distributed between various offices. At the county level, state laws are enforced by the Environmental Protection Agency. Directives are translated into action by the City Councils and their Environmental Offices. Natural resources in forests are managed according to the forest regulations based on Forestry Management Plans and enforced by the foresters (A. BLUMER, pers. comm.). As forestry has a long tradition in Romania, it has often been managed according to ecological principles. As a result of forest privatisation on a large scale, new threats to the

Romanian forests have emerged (A. BLUMER, pers. comm.). For large protected areas, management plans have been or are being developed to implement legislation.

11.4 Potential Mechanisms for Financing Conservation Through MAP Collection and Trade

Money flow for nature conservation from governmental financial resources has increasingly ebbed away in recent years, for which reason a diversity of alternative financial instruments for funding nature conservation and protected areas has to be considered (STOLPE, in press). Private sector approaches as well as market approaches could provide adequate, additional mechanisms to ensure nature conservation in and outside protected areas through the sustainable use of natural resources.

The collection of medicinal and aromatic plants from the wild is a funding source of considerable potential in Southeast Europe, where MAP wild-collection is still widely practised. Funding mechanisms for nature conservation resulting from these activities may include (G. STOLPE, pers. comm.):

- licence fees for collectors
- taxation of international MAP trade
- participation in eco-labelling or certification processes for products based on MAPs from the region
- intensification of efforts of protected areas management authorities to organise collection, processing and trading of MAP material within the PA
- voluntary contributions from large MAP companies

Countries like Bulgaria and Romania have already established such systems. However, it is not always nature conservation that benefits from revenues resulting from licence fees or trade taxation, because often the money flows into an overall state or ministerial budget. Mechanisms need to be installed to make sure that the revenues either benefit the respective area directly or are channelled into a National Fund from where finances are then redistributed to benefit conservation or protected areas as a whole. Insufficient personnel capacities, low income and cultural or legal restraints can cause further obstacles in realising such alternative funding options (G. STOLPE, pers. comm.). Funding concepts including the use of revenues gained from the trade in MAPs should guarantee that benefit sharing principles are realised and that the sustainable wild-collection of MAPs helps to add value to the ecosystem for the local population, thus providing both an attractive source of income and an incentive to protect ecosystems and their natural bio-resources such as MAPs.

To get these systems established, international donors such as NGOs, state organisations and international companies may be potentially interesting funding sources, because many organisations prefer to support concepts based on the sustainable use of natural resources.

12 Pilot Projects

In the following, selected examples of pilot projects both from the five countries studied and from other countries, illustrate some practical possibilities and incentives for and obstacles to the development of strategies for a sustainable use of medicinal and aromatic plants (MAPs) and other non-timber forest products (NTFPs) in and around protected areas.

In Albania, there is a project on the sustainable use of natural resources in the Prespa (NP) and Ohrid (Landscape Reserve) region, carried out in co-operation with the German NGO Euronatur. This project will be described below.

In BiH there is a project entitled: 'Medicinal and Aromatic Plants. Wild Collection and Sustainable Use'. The outlines of this project will be described below.

However, in both Albania and Bosnia-Herzegovina no projects are known that use parts of the income generated by the wild harvesting of MAPs in protected areas to directly finance protected areas (Z. DEDEJ and D. PEĆANAC, pers. comm.), most likely because wild harvesting in protected areas is either totally banned (BiH) or allowed (under a licensing system) only in a limited number of national parks (Albania).

In Bulgaria, there is an interesting project in the Central Balkan National Park. In co-operation with ARD (Agency for Regional Development) the national park management is trying to establish the sustainable use of *Vaccinium myrtillus* inside the protected area (P. ZHELEV, pers. comm). This project is related to the general evaluation of the current resources and efforts to prevent over-exploitation of natural resources. The project tries to fill a gap in the national legislation, which allows the collection of NTFPs up to 10 kg per day and person for private use, which lead to a large number of people entering the national park and collecting berries or MAPs in considerable amounts, claiming it was for personal use (G. STANEVA, pers. comm.). The park authorities developed a management plan and issued 'tickets for collection' (TCs) to everyone interested, each ticket equalling 10 kg of blueberries. The intermediate traders had to collect these tickets and return them to the park authorities again. That way, the park authorities could assess the rough amount of blueberries collected in the pilot region (G. STANEVA, pers. comm.). Generally, all collectors have to pay a licence fee to the National Park administration which is used for conservation purposes. (see pp. 114).

In addition, there are several governmental initiatives such as the Bulgarian-Swiss Biodiversity Conservation Programme (for details cf. www.bsbcp.org); however, these initiatives do not basically aim at gaining revenues for nature conservation through the sustainable use of bio-resources.

No pilot projects are known from Croatia.

In Romania, funding of nature protection through revenues from MAP trade is already part of the taxation system. For every kilogramme exported, the companies have to pay a tax, which is used to

safeguard national parks and biosphere reserves that currently do not have an effective administration or inspection staff (Gh. COLDEA, pers. comm.). An interesting project about the sustainable use of *Arnica montana* has been started in the Apuseni region, which is partly a national park. This project will be described in detail below.

Projects to establish a sustainable wild collection of MAPs as well as other NTFPs in protected areas and to use parts of the revenues from selling these products for financing nature conservation are also known from other parts of the world. Examples of such projects are:

In Kyrgyzstan, the German GTZ has promoted the establishment of the Issyk-Kul Biosphere Reserve. The project started in 1995 and led to the national declaration of the biosphere reserve in 1998 and the international acknowledgement by UNESCO in 2001 (KASPAREK 2002). The third phase of the project has started in 2001; its objectives include to (KASPAREK 2002):

- support the establishment of an effective biosphere reserve management
- promote public relations and sustainable tourism
- support agriculture and the sustainable use of natural resources (including medicinal and aromatic plants)
- support a study on the marketing of ecologically produced goods, the collection of medicinal and aromatic plants, and possibilities to improve pasture farming

Details about the project can be obtained from the GTZ Kyrgyzstan Office at Bishkek (drgtz@elcat.kg).

In 2001, WWF has proposed a project entitled 'Promoting the sustainable use of medicinal plants resources in the Caucasus ecoregion' to the Swiss Agency for Development and Cooperation (SDC) covering Armenia, Azerbaijan and Georgia (WWF 2001). In parts, this project is based on an earlier (and still ongoing) project on the improvement of traditional MAP use and cultivation in Georgia, which is carried out by CUNA Georgia and supported by MISEREOR, WWF-UK, WWF International, GTZ and WWF Caucasus Programme Office. Among other activities, this project supports the collectors and farmers of MAPs, cultivation in project regions, processing and marketing of products, and has built up a MAP database (HIRSCH 2002). The WWF project aims to establish sustainable harvesting to protect MAP species in the region, provide additional economic benefits to the rural population, and reduce the dependence on expensive foreign medicines. Pilot sites and communities are to be selected, community members trained, national standards and management guidelines designed and contacts with international pharmaceutical companies developed (WWF 2001). However, it is not part of the project to generate direct income for nature conservation or protected areas authorities through revenues earned by the sustainable collection of MAPs in protected areas.

12.1 Sustainable Use of MAPs in the Ohrid and Prespa Region (Albania)

The Ohrid and Prespa Region is a mountainous area with three lakes (Lakes Ohrid, Prespa and Little Prespa) where the frontiers of Albania, FYR of Macedonia and Greece meet. The Greek and FYR of

Macedonian parts of this region have already been protected by the establishment of national parks. In 1996, the German NGO 'EURONATUR' (European Natural Heritage Fund) in co-operation with GTZ and the Albanian Committee for Environmental Protection (CEP) of the former Ministry of Health and Environmental Protection started a project on the establishment of Prespa National Park in Albania (Gesellschaft für Technische Zusammenarbeit 1998).

The basic objective of this Albanian-German co-operation is to strengthen local initiatives and the development of professional skills for environmental planning and the sustainable use of natural resources in the area (Gesellschaft für Technische Zusammenarbeit 1998). For this purpose, the project supports the Albanian environmental protection group PPNEA, which is particularly involved in nature conservation in this region.

Beside nature conservation and sustainable use of natural resources, the project also tries to assist in the preparation of management plans, provides legal support, and promotes environmental education (Gesellschaft für Technische Zusammenarbeit 1998).

In order to assess the possibilities of a sustainable use of medicinal and aromatic plants (MAPs) in the Ohrid and Prespa Region, a study was carried out by 'EURONATUR' and the University of Tirana; this study was published in 1999 (FREMUTH et al. 1999). The objectives of the study were:

- to assess the medicinal and aromatic plants occurring in the region
- to study the potential of certain MAP species to be harvested sustainably from the wild and to generate income for the local population
- to describe sustainable collection methods for the economically most promising MAP species
- to produce proposals for a long-term monitoring of the MAP populations
- to study possible target species for cultivation
- to develop criteria for a licensing system for the collection of NTFPs
- to discuss possibilities for a national or international eco-label
- to assess the present MAP trade in the region and the potential expertise of the local population

Among the 250 plant species found in the region (for complete list see FREMUTH et al. 1999) the study identified sage (*Salvia* sp.), camomile (*Matricaria recutita*), mint (*Mentha* sp.), thyme (predominantly *Thymus longifolius*), oregano (*Origanum vulgare*), St. John's-wort (*Hypericum perforatum*), hawthorn (*Crataegus* sp.), nettle (*Urtica dioica*) and Mountain Tea (*Sideritis raeseri*) as MAP species with a high potential for a sustainable, commercial wild-collection and trade (FREMUTH et al. 1999). The authors of the study not only investigated the local wild stock, but also the potential market in Germany which is by far the largest destination country for Albanian MAP exports (cf. sections 8 and 9.1). The collection of some species might, however, be restricted by ministerial declaration or by their being listed in Albania's 'Red Book' (e.g. *Sideritis raeseri*, *Digitalis lanata*). Mountain tea is collected in considerable amounts in the area, but it might also be a potential target species for cultivation (FREMUTH et al. 1999).

The study discusses the options of bio-labelling, either adopting the standards of an international label or developing and marketing a regional quality label for the Prespa and Ohrid area, and emphasises the importance of introducing an effective control and monitoring system to guarantee sustainable MAP collection (FREMUTH et al. 1999). A licensing system similar to the already existing state licensing procedure could be adopted by the national park service or the local forestry service, which could grant species-specific licences to collectors. Such a system should be developed together with collector organisations to ascertain their support and simplify control mechanisms (FREMUTH et al. 1999).

12.2 Wild-Collection and Sustainable Use of Medicinal and Aromatic Plants in Bosnia-Herzegovina

In early 1999, the German agency GTZ has initiated a project on the wild-collection and sustainable use of medicinal and aromatic plants (MAPs) in Bosnia-Herzegovina (Gesellschaft für Technische Zusammenarbeit 2002). Based on the fact that, according to estimates, over 100,000 families in rural areas of BiH collect medicinal and aromatic plants, and that this collection is largely uncontrolled and often unsustainable, the project focuses on establishing a management system for harvesting MAPs from the wild in BiH. The project is co-ordinated by the two GTZ country offices in Banjaluka and Sarajevo and is supported by the Swiss SIPPO and the Institute for Market Ecology (IMO; bio-certification). Further co-operation partners are SEED/IFC, WHO, FAO and WWF/TRAFFIC.

The project objectives were (Gesellschaft für Technische Zusammenarbeit 2002):

- to support the change from traditional collection and traditional business management to the sustainable use of biodiversity
- to generate income for the rural population involved in MAP collection
- to establish a modern supply chain management

The project includes all levels of production, processing and marketing. The project concept specifies the development and introduction of (Gesellschaft für Technische Zusammenarbeit 2002):

- resource management plans
- bio-certification
- business plans
- marketing concepts

All these processes, from the wild-collection to the final sales step, will be documented and monitored through bio-certification. By developing and implementing these management systems, the project aims to (1) protect Bosnia-Herzegovina's rich natural heritage and biodiversity, especially its medicinal and aromatic plants and (2) strengthen the country's export-oriented MAP industry by a system that fits into the GMP-systems of potential clients (Gesellschaft für Technische Zusammenarbeit 2002).

To meet these goals, GTZ project activities comprise, amongst others:

- Company counselling in the incorporation of sustainability aspects, quality management and collectors' training
- Supporting marketing through the organisation of 'Seller/Buyer Meetings', the introduction of bio-certification for 18 companies, and the participation in international trade fairs
- Initiatives to establish EU-compatible product standards, improve the legal framework, and develop a national strategy for sustainable use and preservation of MAPs

A specific programme on the cultivation of *Gentiana lutea* has been initiated within the framework of this GTZ project (D. PEĆANAC, pers. comm.). The Gentian programme ('Program of Gentian Domestication as Endangered Species') will start in autumn 2002 and aims to explore the possibility of domesticating *Gentiana lutea* in BiH, produce seedlings and finally cultivate the species as an interesting perspective to farmers and companies and a measure to reduce collection pressure on the endangered wild-stock of this species (D. PEĆANAC, pers. comm.). The project is financially supported by GTZ, and the Agricultural Institute in Banjaluka will implement the programme. The Agricultural Institute will transfer the technology and know-how to the interested companies and develop a 'good practice' standard for *G. lutea* seedling production and cultivation (D. PEĆANAC, pers. comm.). The development of a collector's manual is also part of the project (DUNJIC & DUERBECK 2002).

12.3 Sustainable Use of *Arnica montana* in the Apuseni Region (Romania)

The 'Proiect Apuseni - O SANSA PENTRU TARA MOTILOR' (identification of social, economic and ecological potentials for a sustainable regional development exemplary studied in the Apuseni Mountains) not only addresses the sustainable use of *Arnica montana* but also tries to establish a long-term strategy for protecting the region's ecological diversity and to provide a sustainable economic perspective for the local population (B. MICHLER, pers. comm.). Sustainable tourism is another important target of the project. Further information about the 'Proiect Apuseni' can be found under http://www.proiect-apuseni.org (in German).

The Apuseni Region is an area of high biodiversity with about 2,000 different plant species, including 200 medicinal and aromatic plant (MAP) species. Apuseni is one of the most important areas for the wild-harvesting of *Arnica montana* in Europe. About 20 tonnes of fresh raw material are estimated to be collected in this area every year, resulting in about 7-10 tonnes of dried raw material in trade (B. MICHLER, pers. comm.; this calculation is based on a dried:fresh ratio of between 1:2 and 1:3; however, the ratio dried:fresh weight is determined between 1:5 and 1:6 by other experts; D. LANGE, pers. comm.) In 2001, 20 tonnes of dried flower heads were officially permitted to be collected from the wild in the district of Cluj (MICHLER & REIF 2002). The average weight of a dried Arnica flower is 0.27 grams (MICHLER & REIF 2002); therefore, about 3,700 flower heads have to be collected to obtain one kilogramme of dried Arnica flowers. Consequently, 20 tonnes dried Arnica flowers equals 74 million Arnica flower heads collected.

During the past two years, B. MICHLER (Albert-Ludwigs-University of Freiburg, Germany) in co-operation with Dr. Gh. COLDEA (Director of the Institute of Biological Research, Cluj-Napoca) and with the support of the German Federal Ministry of Education and Research (BMBF; Research Focus 'Integral Conservation in Agriculture') has carried out a field study on the wildstock of *Arnica montana* and its development. About 50 reference areas have been regularly investigated and surveyed. Small-scale mapping (1 : 5,000) will be carried out with the help of satellite pictures (B. MICHLER, pers. comm.). The results of this research are still preliminary and unpublished (B. MICHLER, pers. comm.). However, from both field observations and interviews with the local population and collectors it seems to be evident that the *Arnica montana* wild-stock in the Apuseni region has declined during recent years due to over-harvesting (B. MICHLER, pers. comm). Exact estimations and calculations about the future development of the wildstock are difficult, because *Arnica montana* is a very sensitive plant: sometimes, there are only two flowering plants to 100 vegetative Arnica plants (MICHLER & REIF 2002; B. MICHLER, pers. comm). Arnica's growth and distribution depend on a number of different ecological and chemical parameters, which occasionally have a very limited tolerance span (D. LANGE, pers. comm.). Sudden disappearance may locally occur as well as sudden appearance of *Arnica montana* on grounds where the species has not grown for some years, as witnessed in the Vosges Mountains, France (D. LANGE and A. ELLENBERGER, pers. comm.).

Arnica montana flowers are a high price drug. Wholesalers can fetch up to € 75 per kilogramme dried Arnica flowers on the international market (although usually the price is much lower, D. LANGE, pers. comm.); local collectors in the Apuseni region, however, obtain as little as € 1.10 per kilogramme fresh Arnica flowers (MICHLER & REIF 2002) (calculated weight relation 'fresh : dried' flowers is between 2:1 and 3:1). Therefore, one of the aims of the project is to increase local and domestic value absorption in the region by promoting direct marketing (reducing the number of intermediate steps in the chain of custody) and by establishing local raw material processing enterprises (B. MICHLER, pers. comm.). These processing units shall produce Arnica tincture and oil products by macerating the flowers.

Beside *Arnica montana*, other NTFPs will be included in this project. Among these are *Vaccinium myrtillus*, which is collected in large amounts and exported profitably, and the edible boletus (*Boletus edulis*), which is already collected and exported (mainly to Italy) in considerable quantities (B. MICHLER, pers. comm.).

Hitherto, obtaining financial revenues for nature conservation from sustainable use of NTFPs in Muntii Apuseni National Park and the Apuseni region has not been an integral part of the project plan, but it may be an interesting option once the main aims of the project will have been at least partly achieved.

13 Discussion and Conclusions

The use of medicinal and aromatic plants (MAPs) in and the social structures of all five countries studied (Albania, Bosnia-Herzegovina, Bulgaria, Croatia and Romania) have many aspects in common:

(1) all countries are in the process of transition from a state-controlled to a market economy, which has started during the last decade of the 20th century
(2) in all countries, basic economic issues are more pressing than environmental issues, hence economic development is usually prioritised by politics
(3) all countries are particularly rich in biodiversity and natural resources
(4) in all countries, the collection of MAPs from the wild is an integral part of the traditional way of life of many people and families in rural communities; however, traditional forms of land-use such as the collection of MAPs are occasionally under threat due to economic changes
(5) with only few exceptions, protected area management in all five countries is difficult, either because it is not organised effectively or because it suffers from financial and staff shortage, or both. Increasing the value of natural resources for the local people within or nearby a PA could be part of a strategy to counter weak enforcement.

Taken this situation into account it is tempting to suggest combining sustainable MAP use in protected areas and financing nature conservation in these protected zones (LANGE 2001). Besides providing additional income for protected areas, such combination could also help to add value to natural bio-resources and improve the acceptance of protected areas in the country in case there is a monetary benefit for the local population (LANGE 2001). However, methods should be found to guarantee that the income generated for nature conservation purposes is transferred to an independent fund that is directly available for use by the responsible authorities, institutions and organisations. Financial benefits – particularly for the local population – could also be achieved by direct or semi-direct marketing of MAP raw material, cutting out most of the intermediate trade, and by promoting local processing of MAP raw material in order to achieve higher market prices (LANGE 2001). Such measures can be important incentives for maintaining the traditional land-use, which contributes to the survival of certain MAP species.

Except for Bulgaria, all countries are lacking an effective management system to ensure that MAP harvesting from the wild is sustainable and that protected areas are properly administered in order to fulfil their functions. This would be one of the fundamental prerequisites, before one may talk about the potential of using parts of the revenues from the trade of MAPs from protected areas for nature conservation purposes or to support protected areas financially. On a reduced scale, however, some initiatives show that, even in view of legal obstacles or a legal vacuum and structural disorganisation, small projects on the sustainable use of natural bio-resources and the re-investment of revenues in nature conservation are possible.

The basic incentive to promote the sustainable commercial use of NTFPs such as medicinal and aromatic plants is to add value to natural or semi-natural ecosystems such as forests (‘economic

valorisation of nature') to protect these ecosystems with the support of the local population and responsible authorities, who realise that they profit economically from nature conservation. Naturally, this works only if the commercial use is developed and managed in co-operation with all parties involved and with a long-term perspective.

Consequently, the question arises: can the introduction of fees for the commercial (and maybe also non-commercial) use of natural bio-resources such as MAPs or other NTFPs in protected areas in the five countries studied be brought into line with the criteria for sustainability with relation to nature conservation in these protected areas? To find an answer to this question, one may consider experiences from Bulgaria.

Bulgaria has shown that there are some options. The trade of MAPs collected in some protected areas and the protected areas management have become linked: collectors have to pay a set, species-specific fee per kilogramme raw material collected, and the protected areas management takes over the marketing and trade of the raw material; the intermediate trade can be cut out to a large extent, which increases the revenues for the protected area and compensates for the fee the collectors originally had to pay. To reduce costs further the PA management has tried to build up trade links with certain MAP trading or processing companies working in the area.

However, such a scheme works only if the protected areas have a certain independence from national or regional governments. Federal- or state-controlled protected area management authorities (as for example in most Romanian and Albanian PAs) usually cannot be financed by revenues from commercial activities, because these revenues become part of the state or district budget. As the example of the biosphere reserve 'Schorfheide-Chorin' in Germany shows, federal- or state-governed protected areas have to find other financial solutions. This biosphere reserve is governed by the 'Land' (province) and as such is not allowed to make profits from marketing ecologically produced food or from other commercial activities inside the protected area (E. HENNE, pers. comm.). As a 'way to by-pass this restriction', a number of different associated promotional societies have been founded (e.g. the society 'natural landscape Uckermark'), which are able to channel various small sources of income into nature conservation projects inside the biosphere reserve.

These examples illustrate financing possibilities, but it has to be kept in mind that they cannot be directly transferred to other countries. They illustrate also that the first step towards a sustainable use of natural bio-resources has to be the development of comprehensive management systems. These management systems should consider operating on different levels:

(1) the international level
(2) the state level
(3) the regional level
(4) the local level

The order of these levels does not reflect any hierarchy in terms of importance and only a limited hierarchy in terms of time.

(1) The International Level

The international level comprises (a) important agreements, which are generally, or at least for the most part, accepted world-wide or within a group of states (such as the Convention on Biological Diversity or GMPs; see section 11.1) and (b) legally binding acts on all contracting parties (such as CITES or EU-legislation), which – for example in questions of import and export restrictions – even have impacts on countries currently not being parties to conventions or members of a group of states. The international level can at least provide a basic framework, which very often is no more than the lowest common denominator that international communities of states may be able to agree upon. In this context it is important not to internationally over-regulate aspects such as natural resources management or production and trade of natural resources in order to avoid overriding the individual needs of each country and region, which may differ considerably from a desirable international standard at any given time.

However, it seems worthwhile to put more effort into achieving a broader international basis for an agreement on 'Good Wild-Harvesting Practices' for medicinal and aromatic plants. It will certainly be a tightrope exercise to take into equal consideration the interests of the industry, nature (often represented by NGOs), state authorities and collectors or collectors' groups in the development process of such 'good practices' guidelines, but previous experiences from different certification systems for timber and wood forest products and forest management have shown the importance of making the effort to create a single common agreement rather than competing systems. Several different guidelines or proposals for 'good practices'-guidelines concerning the wild collection of NTFPs exist (see section 11.1). Most of these guidelines and drafts have a strong economic bias. Therefore it remains an important objective to promote and if necessary claim the inclusion of further ecological and above all social criteria in these guidelines to ensure that the importance of ecological and social sustainability of commercial NTFP use is considered adequately. This is a big task, and it may be taken as an indicator of success if the interest groups involved manage to agree upon a single framework version of such guidelines.

(2) The State Level

The state or national level comprises (a) the establishment of a state ministry responsible for environmental issues and nature conservation, (b) a legal framework for nature conservation and protected areas, (c) laws and regulations on the sustainable use of natural bio-resources, and (d) a concept for the implementation and enforcement of legislation.

In all five countries, state ministries responsible for environmental issues and nature conservation have been installed during the last 10 years. The share of the state budget available to these ministries is relatively small, because nature conservation is mostly not regarded as an issue of crucial importance. This applies to most countries world-wide and it may be assumed that this appraisal is rooted in a lack of immediate economic returns from nature conservation in the short term. Therefore it is important to stress the consequences and long-term effects of environmental protection and nature conservation on the economy of each country to strengthen the status of the national environmental ministries and environmental institutions.

A legal framework for environmental and nature conservation issues has come into force in all the five countries studied. In Bosnia-Herzegovina, there are three partly independent legislative systems: one at state level and two at sub-state (entity) level in the Federation of Bosnia-Herzegovina and in the Republika Srpska, implying a basic legislative independence of the two entities in questions of the environment and nature protection, among other issues. This structural peculiarity is an outcome of the Dayton Peace Agreement and has come about for basically ethnic reasons, but it could turn out a weak point in the country's further development, which also affects nature conservation in the region.

Special legislation on the sustainable use of natural resources such as medicinal and aromatic plants and other NTFPs is still not well developed in Albania, Bosnia-Herzegovina and Croatia, and only moderately developed in Romania.

Bulgaria has a fairly effective legislative system relating to the sustainable use of natural resources and has started to adopt European legislation in its national laws and regulations. Only the high forest taxes imposed on the collection of NTFPs some years ago have proven to be counterproductive in terms of sustainability in some cases, because they were an occasional burden on the competitiveness of the industry and for the net income of local collectors.

A major problem in all five countries, partly except for Bulgaria, is law implementation and enforcement. An objective to be met in the future would be improved implementation by (1) more clearly structuring responsibilities for law implementation and control, (2) increasing the staff and the financial means available to the authorities and administrative bodies responsible for law enforcement and control, and (3) establishing a country-wide monitoring system collecting data and documenting the use of medicinal and aromatic plants and other NTFPs in the country. The sustainable use of natural resources would require such a monitoring system. To date, only Bulgaria has an adequate monitoring system.

(3) The Regional Level

All five countries have both centralised and de-centralised administrative structures. This involves a regional level filling the space between the national governmental bodies and the municipalities and communes. Regional governments can have partial legislative independence and sovereignty (e.g. in Bosnia-Herzegovina) and are usually responsible for guaranteeing the implementation of national legislation. Their advantage is that they are better able to consider regional conditions, needs, and interests, which may be different from national priorities. With regard to medicinal and aromatic plants, there are considerable differences between the regions within a country: in the Romanian Apuseni Region (district of Cluj) for example, wild-harvesting of MAPs has a much greater social and economic importance than in the Romanian Danube Delta Region (e.g. district of Tulcea), where commercial MAP wild-collection plays only a minor role. For this reason, the objectives for those regional governments on whose territories MAP collection is important should be (1) to strengthen their position vis-à-vis the central government, (2) to make use of their scope to implement legislation, adapting it to the needs of the region and (3) to initiate or encourage the development of models and management plans for the sustainable use of medicinal and aromatic plants and other NTFPs in their

region (see below). Regional administrative bodies may also be able to stimulate or support regional co-operation between local authorities, collectors and trading companies to facilitate the development of strategies for the sustainable use of natural bio-resources, which should provide profits to all parties involved.

(4) The Local Level

The local administrative bodies (municipalities, communes) have, in principle, the same tasks and options as the regional authorities. However, there is often a more direct link between the economic activities on the territory of a municipality and the parts of the income derived from these activities by the local authorities; therefore, municipalities usually have a keen interest in the sustainability of local economic activities. It seems to be important to point out to local authorities how sustainability can be achieved with regard to the use of natural bio-resources. They should be encouraged to develop management plans for the sustainable use of MAPs. National and international parties (institutions, NGOs, authorities and others) that have already gathered some experience in the development and the implementation of such management plans could assist the local authorities.

Protected areas managements are either centralised (usually accountable to the national environmental ministry or associated institutions) or are administered regionally or locally, depending on the status and size of the protected area. In many, but certainly not all cases it could be desirable to encourage a decentralisation of PA management structures and to promote a stronger independence of PA management authorities in order to guarantee that management strategies better meet the actual needs of the PA, the region and the municipalities on whose territory the protected area is located. Centralised administrations tend to develop identical management structures for all protected areas of comparable status within their jurisdiction, and often do not consider the individual situation and needs of each individual protected area.

Appropriate management systems at international and national level are important basic instruments for developing regional and local management plans. However, these international and national systems have in some cases not yet reached a sufficient level of agreement and efficiency. Nevertheless it is helpful to develop regional and local management plans within the international and national frameworks presently available because the development of effective management structures may not only work ‘top-down’ but also ‘bottom-up’.

Management Plans for the Sustainable Use of Natural Bio-Resources

Management plans for the local and regional, sustainable use of natural bio-resources can, reasonably, be developed only by the parties directly involved. Therefore, these general outlines will be only a suggestion, the central aspects of which seem, from the authors’ point of view, important to be considered.

Two basic goals should be achieved by these management plans:

(1) guarantee the sustainability of the use of natural bio-resources

(2) achieve a common agreement between all parties and groups involved in the collection, production, trade and processing of medicinal and aromatic plants and other natural bio-resources in the area for which the plan is applicable

As there is an occasionally over-stressed current tendency to 'manage' everything, it may be worthwhile proceeding cautiously in order not to 'over-manage' traditional processes such as the collection of MAPs. Regional and local management plans, however, have the advantage that they can be developed for a single area and can therefore be closely adjusted to the local situation.

Regional and local management plans for the sustainable use of natural bio-resources may have the following crucial components (this list is only a general suggestion and does not claim to be complete):

(1) Resource Management Plan

(a) Natural resources; (b) Personnel resources; (c) Financial resources; (d) Expertise

(2) Business Plan

(a) Definition of goals to reach; (b) Financial obligations; (c) Definition of time frames; (d) Potential partners / co-operation

(3) Marketing Concept

(a) Market analysis; (b) Marketing channels; (c) Processing of raw material; (d) Product labelling; (e) Bio-certification

(4) Education and Training

(a) Evaluation of traditional knowledge; (b) Evaluation of the interests of collectors, traders, processing industries and administrative authorities; (c) Training of collectors and traders; (d) Workshops for representatives of all groups and parties agreeing on the management plan

(5) Monitoring, Control and Documentation

(a) Development of law enforcement and control strategies; (b) Development of a monitoring system; (c) Evaluation of the demand for personnel to control and monitor; (d) Establishment of a database

Specified for medicinal and aromatic plants, a first step would be the development of an inventory if not already present. This inventory should include the species, populations of species and estimated amounts of specimens on the area for which the management plan is effective, a description of habitats and plant communities and the estimated annual population growth. In a second step, the annual and species-specific harvesting volumes should be determined, which guarantee the sustainable use of each single target species. The maximal harvesting volumes have to be species- and / or population – specific and annually re-assessed. The target plant parts, optimal period of harvesting, and adequate

harvesting techniques and tools should be clearly laid down. Based on these provisions and on the annual amounts that can be sustainably harvested, the management plan should – within the framework of the international and national law – derive for which species collecting permits have to be issued, determine the conditions for obtaining such permits and name the authoritie(s) responsible for issuing and controlling the permits. An adequate monitoring system should be extablished, which keeps the inventory up to date. All these requirements a management plan should fulfil are both essential to consider in and outside of protected areas.

For management plans developed for the territory of a protected area, several further parameters have to be looked at. Besides the legal framework that mostly determines whether or not medicinal and aromatic plans are allowed to be collected inside the protected area, these management plans have to consider the type of PA, its objectives of protection, its relevance for the national natural heritage and other factors. As for the generation of income for the local population, existing options should be evaluated. To give some examples: a protected area defined as biosphere reserve requires the adequate and as far as possible harmonious use of the area (except for core zones) for the purpose of nature conservation and traditional, sustainable use of its resources including the option to develop new methods of sustainable use. Very often, traditional forms of living and land use play a vital role for both the local population and for natural resources such as medicinal and aromatic plants. Owing to this concept, these protected areas offer good chances to develop mechanisms involving a direct re-investment of revenues earned from trading natural bio-resources sourced from within the PA for nature conservation projects and programmes of the protected area management. A national park on the other side may shift its focus to the conservation of unique habitats or outstanding natural beauty. In such case, managing the park may not or to a lesser degree include the sustainable consumptive use of natural bio-resources and e.g. focus on tourism as a non-consumptive use instead. Valorisation of the protected area for the local population and re-investments into conservation projects can primarily be achieved by earnings from tourism and not by the use of medicinal plants. These examples illustrate the importance of a comprehensive and individual management plan for each protected area.

Outlook

The sustainable use of natural bio-resources contributes to added value for and a valorisation of nature for the local population, for the industry involved in trading or processing these resources, and for the authorities, because it guarantees the long-term prospect of continuous revenues earned from the responsible use of self-regenerating raw materials. Such a long-term perspective requires the co-operation of all parties and a mutual acknowledgement of interests. With regard to protected areas and taking the results of this study into account, this co-operation could include the following aspects:

(1) Inventorying. The assessment of medicinal and aromatic plants (species, distribution, and population sizes) in the region (inside the PA and in the vicinity), the current state of MAP wild- collection activities, and the determination which species could be collected sustainably in what quantities.

(2) The establishment of effective control and monitoring mechanisms (licences; taxes; supervision by patrols; research; databases) and the development of criteria for a licensing system. This system should be discussed and preferably be agreed upon by all groups affected.

(3) Exchange of information. Collectors can be trained by specialists in order to understand the needs of traders and the industry (which species should be collected; what collection methods can be applied; how to avoid reducing the purity of the collected raw material through incidental by-collection of other species). The training of collectors should also comprise the principles of conservation and sustainable use. Traders and industry representatives can learn from collectors about their traditional knowledge, which often includes not only knowledge about the healing effects of certain species but also appropriate times of collection, traditional recipes and mixtures used for herbal teas or applications in folk medicine. This offers a chance to preserve traditional knowledge that might otherwise be lost. If a relationship of mutual confidence can be achieved, collectors could also be the most reliable informants about the local levels of the wild-stock and species-specific population developments in the area.

(4) Benefit sharing. The local population should be provided with employment, income and incentives to protect their resources. Prices and quantities purchased by traders or the industry should be guaranteed. Collectors have – over the long term – to be guaranteed a certain income level; trade structures that give the collectors a higher profit by cutting out part of the intermediate trade should be developed. In this way, the management plan proposes more calculable goals. This can be achieved if reliable links between collectors, protected areas managements and companies are developed. It may be possible to achieve higher market prices if the raw material is processed in the region or country and products are sold on the national and international markets. A prior assessment and – if necessary – improvement of the infrastructure may be an advantage. Market analyses with regard to current and potential main destination countries for MAP exports may be helpful.

(5) Marketing. The demand for ecologically and sustainably produced MAP raw material and products thereof should be increased by new marketing strategies. Direct marketing should be supported. Protected areas, with their particular natural beauties and the usually higher level of tourism, can try to promote the marketing of products from the area by using a characteristic label. An alternative is the adoption of the standards of some well-known international quality label. An export-oriented MAP industry could be supported by a system, which fits in the GMP-systems of potential clients.

(6) Bio-certification. As the demand for eco-products increases in many import countries in Europe, bio-certification would also be an option to consider. Even in consumer countries, however, raising awareness of the importance of a sustainable use of natural resources is still a major task and the way forward may be difficult.

(7) Income for Protected Areas. Mechanisms can be developed to generate income from MAP collection and trade for the PAs in which MAPs are already collected.

There are some further obstacles to the promotion of MAP use and MAPs sourced from the wild in protected areas in Southeastern Europe. In countries like Albania and Bosnia-Herzegovina, the current state of MAP and other plant species has not yet been sufficiently well assessed by independent, scientific studies. In some countries, the wild-collection of medicinal and aromatic plants and other NTFPs in protected areas is prohibited (Bosnia-Herzegovina; Croatia) or partly restricted (Albania; Romania). As long as the sustainability of collection cannot be guaranteed due to a lack of co-ordination, control and monitoring, these restrictions are important in order to maintain a minimum of nature protection in these areas.

Another issue often discussed is the promotion of a shift from wild collection to cultivation for as many MAP species as possible. For the industry, this is in most cases an attractive alternative (at least for species which are demanded in large quantities), because harvest yields and prices are more calculable and the agent concentration of MAPs sourced from cultivation is usually more constant and predictable. As a rule, such a shift is less favourable if ecological and social aspects are taken into account. Thousands of collectors in Southeast Europe would lose their income if there was no longer a demand for MAPs harvested from the wild. The promotion of cultivation would, at first glance, take the pressure from wild MAP species and their habitats, because the quantities collected may decrease. Over the long-term, however, the protection of medicinal and aromatic plants in these natural habitats will most likely become less important to the local population and to authorities, because the economic value of wild MAPs will have reduced or become non-existent. Therefore, a further shift from wild-collection to cultivation most likely will not help the protection of MAP species in the wild, nor will it be of economic benefit for protected area authorities.

The initial question remains: could the introduction of fees for the commercial (and maybe also non-commercial) use of natural bio-resources such as MAPs or other NTFPs in protected areas in the five countries studied be brought into line with the criteria for sustainability in these protected areas?

Investigations carried out for this study showed that the majority of people responsible for protected area management in the countries studied expressed their scepticism about how realistic and wise this approach may be, given the situation in their countries. Central aspects of criticism were:

(1) The sustainability of large-scale MAP collection from the wild is not yet guaranteed; therefore, diverting parts of the revenues from MAP wild-collection to finance nature conservation may have an adverse effect, because people and companies involved in collecting may try to collect even larger quantities of MAPs to compensate for the fees to be paid.

(2) Most MAP collectors are either older people or belong to poorer groups in society; additional fees taken from the revenues of MAP trade would either directly or indirectly affect these people in a negative way. Even if they themselves did not have to pay the fees, the companies would pass on the burden imposed by fees for nature conservation purposes to the providers of the raw material, for example by cutting payments.

(3) According to people responsible for nature conservation, especially in Romania (T. MIRCEA, G. BABOIANU, pers. comm.) and Bosnia-Herzegovina (cf. section 11.3.2), protected areas should basically be developed for the purposes of nature conservation. Opening up these areas (e.g. national parks) for the larger-scale use of natural resources such as MAPs and other NTFPs would endanger the mission of protected areas, especially because, at present, it seems impossible to guarantee that these resources will be used in a sustainable way. T. MIRCEA expressed his concern that a study such as this could be dangerous in that it could provide an opening for the industry to become more active in protected areas, which would then be increasingly difficult to protect and manage effectively. However, one has to keep in mind that the different types of PAs (according to the IUCN PA management categories) have different objectives. Some of them could easily accommodate sustainable use without violating their objectives (G. STOLPE, pers. comm.).

As a conclusion, it seems reasonable to consider sharing the benefits from the trade of MAPs and other NTFPs wild-collected in protected areas only if, first of all, the sustainability of the wild-collection is guaranteed, collectors have a reliable and sufficiently high income, and the protection of wild species is not endangered. Logging fees are widely used in many protected areas and could serve as a model since their introduction has not always led to unsustainable exploitation. In general, however, one might ask whether such an additional fee is a fair solution, because it would affect only collectors and traders who are active in protected areas. Protected areas are - and should be - representative areas in which the biological, ecological, geological and landscape diversity of a country or a region is protected from uncontrolled exploitation. These areas are part of the natural heritage of the whole country, therefore it seems more appropriate that not only those who live or work in the protected area but everyone who uses natural resources in a commercial way should contribute to nature conservation and to financing protected areas. For this reason, instruments such as appropriate licence fees (which are effective throughout the country) for the commercial collection and trade of medicinal and aromatic plants and other NTFPs or a taxation system may be more adequate, realistic and fair solutions to source funding for nature conservation and protected areas. It might be a good idea, though, to create a special fund for the income generated by these fees or taxes to ensure that the money does not disappear into the state budget, but is used directly for nature conservation purposes and for protected area management.

14 Abbreviations

ARD	=	Agency for Regional Development (Bulgaria)
a.s.l.	=	above sea level
BfN	=	German Federal Agency for Nature Conservation
BiH	=	Bosnia and Herzegovina (consisting of RS and FBiH)
BMBF	=	German Federal Ministry of Education and Research
BMZ	=	German Federal Ministry for Economic Co-operation and Development
BR	=	Biosphere Reserve
CARE	=	'Co-operative for American Remittances to Europe' – Humanitarian NGO
CBD	=	Convention on Biological Diversity
CEP	=	Albanian Committee for Environmental Protection
DDBR	=	Danube Delta Biosphere Reserve (here only referring to the Romanian part)
DGFP	=	Albanian Directorate General of Forests and Pastures
DPA	=	Dayton Peace Agreement
EIA	=	Environmental Impact Assessment
ELC	=	Environmental Law Center (Bonn) ; part of IUCN
EP	=	Environmental Permit
EPE	=	Environmental Permit for Export (Romania)
EPA	=	Environmental Protection Agency (Romania)
ESC	=	Environmental Steering Committee (BiH)
EUROPAM	=	European Herb Growers Association
FAO	=	Food and Agricultural Organization of the United Nations
FBiH	=	Federation of Bosnia and Herzegovina (part of BiH)
FSRY	=	Former Socialist Republic of Yugoslavia
FYROM	=	Former Yugoslavian Republic of Macedonia
GACP	=	Good Agricultural and Collection Practices
GAP	=	Good Agricultural Practices
GDP	=	Gross Domestic Product
GEF	=	Global Environment Facility
GFCP	=	Good Field Collection Practices for Medicinal Plants
GMP	=	Good Manufacturing Practices
GSP	=	Good Sourcing Practices
GTZ	=	Gesellschaft für Technische Zusammenarbeit
HR	=	Croatia
IBRD	=	International Bank for Reconstruction and Development (World Bank Group)
IMO	=	Institute for Market Ecology, Switzerland
INA	=	International Academy of Nature Conservation, Germany (affiliate to BfN)
IUCN	=	World Conservation Union (formerly International Union for the Conservation of Nature)
KEC	=	Karst Ecosystem Conservation (Croatia)

MAP	=	Medicinal and Aromatic plants (plants completely or partly used for medicinal, cosmetic or dietary purposes)
MoEW	=	Ministry of Environment and Water (Bulgaria)
n.a.	=	data not available
NBSAP	=	National Biodiversity and Strategy Action Plan
NCESD	=	National Center on Environment and Sustainable Development (Bulgaria)
NEA	=	National Environmental Agency (Albania)
NEAP	=	National Environmental Action Plan (Albania)
NGO	=	Non-Governmental Organization
NP	=	National Park
NSAP	=	National Strategy and Action Plan for the biological diversity, Romania
NTFP	=	Non-Timber Forest Products
OHR	=	Office of the High Representative
PA	=	Protected area
PHARE	=	EU financial programme on the enlargement of the European Union
PIC	=	Pharmaceutical Inspection Convention
PPNEA	=	Protection and Preservation of the Natural Environment in Albania (NGO)
QSAR	=	Quantitative structure-activity relationships
REC	=	The Regional Environmental Center for Central and Eastern Europe
RIEW	=	Regional Inspectorate of Environment and Waters (Bulgaria)
RS	=	Republika Srpska (part of BiH)
SDC	=	Swiss Agency for Development and Cooperation
SEED	=	Southeast Europe Enterprise Development
SFOR	=	Special UN Forces for Bosnia & Herzegovina
SIPPO	=	Swiss Import Promotion Programme
s. l.	=	'sensu lato' (taxonomically in a wider sense)
TRAFFIC	=	Wildlife trade monitoring programme of WWF and IUCN (NGO)
WB	=	World Bank
WHO	=	World Health Organization
WSC	=	Water Steering Committee (BiH)
WWF	=	World Wide Fund for Nature

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Selection of Interesting Websites

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Biodiversity Economics Library: http://www.biodiversityeconomics.org (information on how resource use could pay for protected areas, including case studies)

Bulgarian Ministry of Environment: http://www.moew.govrn.bg

Conservation Finance Alliance: http://www.conservationfinance.org (information on how resource use could pay for protected areas, including case studies)

Europ. Cooperative Programme for Crop Genetic Resources Networks: http://www.ipgri.cgiar.org

European Commission, Enlargement Programme: http://www.europa.eu.int/comm/enlargement

EUROPARC: http://www.europarc.org (Federation of protected areas in Europe)

German Federal Agency for Nature Conservation: http://www.bfn.de

Government of Bulgaria (Documents): http://www.govrn.bg/eng/official_docs

Government of Republika Srpska: http://www.vladars.net/lt/srpska

The Herb Exchange: http://www.herb-exchange.com

Herb Research Foundation: http://www.herbs.org

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Regional Environmental Center for Central and Eastern Europe (REC): http://www.rec.org

The Rocky Mountain Herbalist Coalition: http://www.herbcoalition.wildspices.com

Soil Association: http://www.soilassociation.org

Seerecon: http://www.seerecon.org (joint European Commission / World Bank work for Economic Reconstruction and Development in South East Europe)

Statistical Yearbook of the Republic of Croatia, CBS, Zagreb: http://www.dsz.hr

TRAFFIC: http://www.traffic.org (the joint wildlife trade monitoring programme of WWF and IUCN)

UNEP: http://www.unep-wcmc.org (lists of protected areas)

United Plant Savers: http://www.plantsavers.org (a non-profit organization dedicated to the replanting of endangered and threatened medicinal plant species.)

WCPA / IUCN: http://www.wcpa.iucn.org (IUCN-World Commission of Protected Areas)

WWF – World Wide Fund for Nature: http://www.wwf.org

Appendix A: List of Protected Areas in the Five Countries Studied

A.1 Albania

National Parks

Name of PA	IUCN cat.	District	Size (ha)	Date approved
Bredhi i Drenoves	II	Korça	1,380	21.11.1966
Bredhi i Hotoves	II	Përmet	1,200	15.01.1996
Dajti Mountain	II	Tirana	3,300	16.12.1960/1966
Divjaka	II	Lushnja	1,250	21.11.1966
Llogara	II	Vlora	1,010	21.11.1966
Lura	II	Dibra	1,280	21.11.1966
Prespa	II	Korca	27,750	18.02.1999
Qafë-Shtame	II	Kruja	1,200	15.01.1996
Thethi	II	Shkodra	2,630	21.11.1966
Tomorri	II	Berat	4,000	1956/15.01.1996
Valbona Valley	II	Tropoja	8,000	15.01.1996
Zall-Gjocaj	II	Mat	140	15.01.1996

Total surface national parks (ha): 53,140

Strict Natural Reserves / Scientific Reserves

Name of PA	IUCN cat.	District	Size (ha)	Date approved
Gashi River	I	Tropoja	3,000	15.01.1996
Karavasta Lagoon	I (Ramsar WL)	Lushnja	5,000	22.08.1994
Kardhiq	I	Gjirokastra	1,800	15.01.1996
Rrajca	I	Librazhd	4,700	15.01.1996

Total surface strict natural reserves (ha): 14,500

Nature Monuments

Name of PA	IUCN cat.	District	Size (ha)	Date approved
Bredhi i Sotires	III	Gjirokastra	1,740	15.01.1996
Dhrovjan-Syri i Kalter (Blue Eye)	III	Delvina	200	15.01.1996
Vlashaj	III	Dibra	50	15.01.1996
Zheji	III	Gjirokastra	1,500	15.01.1996

Total surface nature monuments (ha): 3,490

Managed Nature Reserves

Name of PA	IUCN cat.	District	Size (ha)	Date approved
Balloll	IV	Berat	330	05.11.1977/1983
Bërzanë	IV	Lezha	880	05.11.1977/1983
Bogove	IV	Skrapar	330	05.11.1977/1983
Cangonji	IV	Devoll	250	05.11.1960/1977/1983
Dardhë-Xhyre	IV	Librazhad	400	15.01.1996
Karaburun	IV	Vlore	20,000	22.02.1968/1977/1983
Krastafillak	IV	Korça	250	05.11.1977/1983
Kular	IV	Lushnja	815	22.08.1994
Kune	IV	Lezha	800	1940/1960/1977/1983
Kuturman	IV	Librazhad	3,600	05.11.1977/1983
Levan	IV	Fier	200	05.11.1977/1983
Maliq	IV	Korça	50	1961/1977/1983
Patok-Fushëkuqe-Negel	IV	Kurbin	2,200	1962/1977/1983
Pishë Poro / Fier	IV	Fier	1,500	1958/1977/1983
Pishë Poro / Vlora	IV	Vlora	1,770	04.08.1969/1977/1983
Polis	IV	Librazhad	450	15.01.1996
Qafë-Bushi	IV	Elbasan	500	05.11.1977/1983
Qafëmollë-Derje	IV	Tirana	3,300	05.11.1960/1977/1983
Qarishtë	IV	Librazhad	318	15.01.1996
Rrezoma	IV	Delvina	1,400	15.01.1996
Rrushkull	IV	Durrës	650	1955,1977,1983, 26.12.1995
Shelegur	IV	Kolonja	430	15.01.1996
Sopot	IV	Librazhad	300	15.01.1996
Stravaj	IV	Librazhad	400	15.01.1996
Tej-Drini i Bardhë	IV	Has	30	15.01.1996
Velipojë	IV	Shkodra	700	1958/1977/1983
Vain	IV	Lezha	1,500	1940/1969/1977/1983

Total surface managed nature reserves (ha): 43,353

Protected Landscapes / Seascapes

Name of PA	IUCN cat.	District	Size (ha)	Date approved
Bërdhet	V	Tirana	670	15.01.1996
Bizë	V	Tirana	1,370	15.01.1996
Nikolicë	V	Devoll	510	15.01.1996
Ohrid Lake	V	Pogradec	27,323	18.02.1999

Total surface protected landscapes / seascapes (ha): 29,873

Managed Resources Reserves

Name of PA	IUCN cat.	District	Size (ha)	Date approved
Bjeshka e Oroshit	VI	Mirdita	4,745	15.01.1996
Guri i Nikës	VI	Pogradec	2,200	15.01.1996
Lucni-Bulac	VI	Dibra	5,900	15.01.1996
Piskal-Shqeri	VI	Kolonja	5,400	15.01.1996

Total surface managed resources reserves (ha): 18,245

Total surface of protected areas in Albania (ha): 162,601 (=5.7 % of territory)

A.2 Bosnia-Herzegovina

National Parks

Name of PA	IUCN cat.	District	Size (ha)	Date approved
Kozara	V	RS	3,375	1967
Sutjeska	II	RS	17,250	1965

Total surface national parks (ha): 20,625

Strict Nature Reserves

Name of PA	IUCN cat.	District	Size (ha)	Date approved
Hutovo Blato	IV (Bird Reserve)	FBiH	350	1954
Mastna Luka	IV		100	1966
Rujiste	IV		100	1980

Total surface strict nature reserves (ha): 550

Nature Reserves

Name of PA	IUCN cat.	District	Size (ha)	Date approved
Dolomitsko Pordrucje Vrtaljica	IV		56	1956
Jezero Klinje Spomenik	IV	RS	170	1968
Prasumsko Podrucje Lom na Klekovaci	IV	RS	295	1956
Sastojina Panciceve Omorike	IV	RS	50	1955
Sumski Predjel Bukov	IV	FbiH	100	1966

Total surface nature reserves (ha): 671

Primeval Reserves

Name of PA	IUCN cat.	District	Size (ha)	Date approved
Durmisevica	IV		44	1980
Janj	IV	RS	195	1954
Lom	IV	RS	295	1956
Perucica	IV	RS	1,434	1954
Pljesivica	IV	FBiH	50	1961
Zuca Ribnica	IV		30	1955

Total surface primeval reserves (ha): 2,048

Regional Nature Parks

Name of PA	IUCN cat.	District	Size (ha)	Date approved
Jahorina	V	RS/FBiH	2,000	1954
Trebeno	V		1,000	1954

Total surface regional nature parks (ha): 3,000

Landscape Parks

Name of PA	IUCN cat.	District	Size (ha)	Date approved
Kruscica	V	FBiH	50	1969
Tisovac	V	FBiH	50	1969
Omar	V	RS	97	1964

Total surface landscape parks (ha): 197

Total surface of protected areas in BiH (RS+FBiH) (ha): 27,091 (=0.57 % of territory)

A.3 Bulgaria

National Parks

Name of PA	IUCN cat.	District	Size (ha)	Date approved
Central Balkan	II	Lovech, Gabrovo, Veliko Tarnovo, Sofia	44,080	1992
Pirin	II	Blagoevgrad	40,067	1962
Rila	II	Blagoevgrad	107,924	1994

Total surface national parks (ha): 192,071

Nature Parks

Name of PA	IUCN cat.	District	Size (ha)	Date approved
Balgarka	IV	Gabrovo	21,772	2002
Choumensko Plato	IV	Shumen	3,930	1980
Persina	IV	Pleven	21,762	2000
Rilski Manastir	IV	Kustendil	27,371	2000
Roussenski Lom	III	Ruse	3,260	1986
Sinite Kamani	IV	Sliven	7,094	1980
Strandzha	V	Burgas	116,260	1995
Vitosha	IV	Sofia	26,607	1934
Vratchanski Balkan	V	Vraca	30,130	1990
Zlatni Pyassatsi	IV	Varna	1,320	1943

Total surface nature parks (ha): 259,506

Biosphere Reserves

Name of PA	IUCN cat.	District	Size (ha)	Date approved
Aliboutouch	Ia	Blagoevgrad	1,628	1951/1977
Bistrichko Branichte	Ia	Sofia	1,062	1935/1977
Biotine	Ia	Lovech	1,597	1948/1977
Djendema	Ia	Plovdiv	4,220	1953/1977
Doupkata	Ia	Pazardjik	1,211	1956/1977
Doupki-Djindjiritza	Ia	Blagoevgrad	2,873	1934/1977
Kamtchia	IV	Varna	1,445	1951/1977
Koupena	Ia	Pazardjik	1,761	1961/1977
Mantaritza	Ia	Pazardjik	1,069	1968/1977
Ouzounboudiak	Ia	Burgas	2,575	1956/1977
Parangalitza	Ia	Blagoevgrad	1,508	1933/1977
Srebarna	IV	Silistra	1,143	1948/1977
Stento	Ia	Lovech	2,637	1980
Tchervenata Stena	Ia	Plovdiv	3,029	1962/1977
Tchouprene	Ia	Bidin	1,440	1974/1977
Tsaritchina	Ia	Lovech	3,419	1949

Total surface biosphere reserves (ha): 32,617

Nature Reserves

Name of PA	IUCN cat.	District	Size (ha)	Date approved
Amzovo	Ia	Sofia	1	1968
Arkoutino	Ia	Burgas	102	1975
Atanasovsko Ezero	IV	Burgas	1,650	1980
Balabana	Ia	Stara Zagora	67	1961
Baltata	Ia	Dobrich	198	1962
Beglika	IV	Pazardjik	1,463	1960
Beli Lom	IV	Razgrad	1,051	1980
Biala Krava	Ia	Veliko Tarnovo	92	1968
Bogdan	Ia	Sofia	115	1972
Boraka	Ia	Haskovo	11	1966
Borovo	Ia	Kardjali	36	1956
Central Rila	Ia	Sofia	12,394	1951
Dervicha	Ia	Shumen	11	1948
Dolna Toptchia	Ia	Stara Zagora	538	1960
Elenova Gora	Ia	Stara Zagora	54	1961
Foret de Rila	Ia	Kjustendil	3,677	1986
Gabra	Ia	Kjustendil	90	1949
Gorna Toptchia	Ia	Jambol	100	1951
Haydouchki Tchoukar	Ia	Veliko Tarnovo	34	1968
Ibar	Ia	Sofia	2,249	1985
Izgorialoto Giune	Ia	Plovdiv	29	1956
Kalfata	Ia	Varna	47	1968
Kaliakra	Ia	Dobrich	53	1941
Kamenchtitsa	Ia	Stara Zagora	1,018	1984
Kastrakliy	Ia	Smoljan	124	1968
Kazal Tcherpa	Ia	Kardjali	176	1949
Kazanite	Ia	Smoljan	161	1968
Kersenlika-Ardachlaka	Ia	Sliven	100	1951
Kirov Dol	Ia	Varna	52	1968
Kongoura	Ia	Blagoevgrad	1,312	1988
Konski Dol	Ia	Blagoevgrad	35	1962
Konski Egrek	Ia	Blagoevgrad	28	1968
Malka Djindjiritza	Ia	Blagoevgrad	339	1947
Momtchilovski Dol	Ia	Smoljan	46	1968
Oreliak	IV	Blagoevgrad	1,228	1985
Orlov Kamak	Ia		323	1973
Ostritza	Ia	Pernik	135	1943
Ouloutzite	Ia		371	1974
Ouroutchnik	Ia		51	1973
Ousketo	Ia		2	1949
Outchilichnata Gora	Ia	Sofia	129	1963
Peechti Skali	Ia	Gabrovo	1,465	1979
Iles de Persin	IV	Pleven	1,715	1981

Name of PA	IUCN cat.	District	Size (ha)	Date approved
Petleyna	Ia	Shumen	4	1960
Piassatchnata Lilia	Ia	Burgas	1	1962
Ravna Gora	Ia		3	1950
Ropotamo	Ia	Burgas	1,001	1992
Sajdenik	Ia		84	1968
Sarpkaya	Ia		24	1968
Savtchov Tchair	Ia	Veliko Tarnovo	102	1968
Severen Djendem	Ia	Lovech	1,610	1983
Silikossa	Ia	Burgas	390	1931
Sini Briag	Ia	Sliven	40	1968
Skakavetz	Ia	Kjustendil	72	1973
Skochnik	Ia		67	1954
Sokolna	Ia	Lovech	1,250	1979
Soskoutcheto	Ia	Smoljan	178	1968
Sredoka	IV	Burgas	607	?
Stara Reka	Ia	Plovdid	1,975	1981
Starata Gora	Ia		23	1956
Stariat Dab	Ia		72	1971
Tamnata Gora	Ia	Blagoevgrad	33	1962
Tchamdja	Ia	Plovdiv	65	1968
Tchamlaka	Ia	Kardjali	3	1954
Tissata	IV	Blagoevgrad	1,452	1949
Tissovitsa	IV	Burgas	749	1990
Torfenoto Branichte	Ia	Sofia	158	1936
Ulen	Ia	Blagoevgrad	3,143	1993
Uzunboudiac	IV	Burgas	2,530	?
Valiavitzite	Ia		83	1951
Valtchi Prohod	Ia	Varna	44	1968
Varbov Dol	Ia	Varna	71	1968
Vitanovo	Ia	Burgas	1,112	1982
Vodnite Lilii	Ia	Burgas	14	1962
Vratchanski Karst	Ia	Vraca	1,439	1983
Zelenikovetz	Ia		62	1951
Zmiyskia Ostrov	Ia		1	1962

Total surface nature reserves (ha): 51,334

Protected Sites (selection; currently there are 146 'protected sites' in Bulgaria)

Name of PA	IUCN cat.	District	Size (ha)	Date approved
Bosna	IV		52	?
Dokuzak	IV		5	?
Kalkata	IV		19	?
Marina Reca	IV		47	?
Moriane	IV		102	?
Nakovo Kladenche	IV		1	?
Paroria	IV		975	?
Rudenovo	IV		15	?
Silistar	IV		773	?
Strandjanski Dab	IV		19	?
Ustie of Veleka	IV		1,511	?
Veleka	IV		1,546	?

Total surface of selected protected sites (ha): 5,065

Natural Monuments (selection; currently there are 473 natural monuments in Bulgaria)

Name of PA	IUCN cat.	District	Size (ha)	Date approved
Enina Dupka	IV		5	?
Melnishki Piramidi	III		1,165	1960
Peshterata	IV		8	?

Total surface of selected natural monuments (ha): 1,178

Total surface of protected areas in Bulgaria (ha): 541,771 (~4.90 % of territory)

Note: The list on protected areas in Bulgaria is not complete; it just gives an overview of some of the important protected areas. At present, there are about 710 protected areas (Ministry of Environment and Water, in comm.). A list of the districts of the 'Protected Sites' and 'Natural Monuments' could not be obtained.

A.4 Croatia

National Parks

Name of PA	IUCN cat.	District	Size (ha)	Date approved
Brijuni	II	Pula (Istra)	3,635	1983
Kornati	II	Murter (Šibenik-Knin)	22,375	1980
Krka	II	Šibenik-Knin	10,900	1985
Mljet	II	Mljet (Dubrovnik-Netertva)	5,375	1960
Paklenica	II	Starigrad, Gospić	10,200	1949
Plitvička Jezera	II	Karlovačka; Lika-Senj	29,462	1949
Risnjak	II	Primorsko-Goransko	6,400	1953
Northern Velebit	II	Senj (Lika-Senj)	10,900	1999

Total surface national parks (ha): 99,247

Strict Nature Reserves

Name of PA	IUCN cat.	District	Size (ha)	Date approved
Bijele i Samarske Stijene	Ia	Mrkopalj and Ogulin	1,175	1985
Hajducki i Rozanski Kukovi	Ia	Senj (Lika-Senj)	1,220	1969

Total surface strict nature reserves (ha): 2,395

Nature Parks

Name of PA	IUCN cat.	District	Size (ha)	Date approved
Biokovo	V	Split (Dalmatia)	19,550	1981
Kopački Rit	V	Osjek-Baranjska	10,510	1967
Lonjsko Polje	V	Sisacko-Moslovacka; Brodsko-Posavska	50,650	1990
Medvednica	V	Krapinsko Zagorska; Zagreb City	22,826	1981
Papuk	V	Požeško-Slavonska and Virovitičko-Podravska	33,600	1999
Samoborsko gorje - Žumberak	V	Zagrebačka and Karlovačka County	33,300	1999
Telašćica	V	Sali (Zadar)	6,706	1988
Učka	V	Istra and Primorsko-Goransko County	14,600	1999
Velebit	V	Lika-Senj; Zadar	200,000	1981
Vransko Lake	V	Pakoštane (Zadar)	5,700	1999

Total surface nature parks (ha): 397,442

Forest Parks

Name of PA	IUCN cat.	District	Size (ha)	Date approved
Busoler	IV		23	1996
Cikat	IV		236	1992
Golubinjak	IV		76	1955
Jankovac	IV		640	1955
Japlenski Vrh.	IV		171	1953
Jasikovac	IV		80	1948
Kolocep-Donje Celo	IV		5	1951
Kolocep-Gornje Celo	IV		12	1951
Komrcar	IV		10	1965
Korcula-Park Hober	V		25	1969
Kosljun	IV		6	1969
Kotar-Stari Gaj	IV		5,218	1975
Laudonov Gaj	IV		33	1965
Lisina	IV		1	1997
Marijan	V		350	1964
Orebic-Cempresada Pod Gospu	V		46	1964
Osjak	IV		18	1954
Osmolis-Suma	IV		12	1951
Predoloc-Sibanica	IV		67	1968
Rovinj-Zlatni rt.	IV		52	1948
Sijana	IV		153	1964
Tepec-Palacnik-Straznik	V		350	1970
Trakoscan	V		86	1955
Trsteno-Brsecine	IV		40	1965
Vujnovic Brdo	IV		170	1948
Zupetnica	IV		39	1983

Total surface forest parks (ha): 7,919

Natural Monuments

Name of PA	IUCN cat.	District	Size (ha)	Date approved
Brusnik	III		3	1951
Cerovacke Pecine	III		0	1961
Cetina-Vrela	III		30	1972
Crna Pecina	III		0	1964
Crveno Jezero	III		14	1964
Fantazija	III		4	1986
Gacka-Vrela	III		24	1973
Golubnjaca Pecina	III		0	1964
Gotovz-Ponor	III		0	1969
Grgosova Spilja	III		0	1974
Gromacka Spiljy	III		0	1986

Name of PA	IUCN cat.	District	Size (ha)	Date approved
Husnjakovo	III		0	1948
Jabuka	III		1	1958
Kupa-Izor	III		10	1963
Ledenica Spilja	III		0	1970
Lovarka Spilja	III		0	1961
Mackova Pecina	III		0	1966
Markova Jama	III		0	1986
Medvidina Spilja	III		0	1967
Mociljska Spilja	III		0	1963
Modra Spilja	III		1	1951
Modric Pecina	III		0	1986
Modro Jezero	III		39	1964
Ostrovica Spilja	III		0	1970
Pazinska Jama	III		0	1964
Pcelinja Pecina	III		0	1970
Petriceva Pecina	III		0	1970
Podbaredine	III		0	1986
Raca Spilja	III		0	1965
Ravnik Spilja	III		0	1967
Rupnica-Primatsko Lucenje	III		1	1948
Samogradska Pecina	III		0	1964
Sipun Spilja	III		0	1963
Stara Straza Slojevi	III		1	1961
Stinava	III		4	1967
Supljara Pecina	III		0	1964
Una-Vrelo	III		2	1968
Vela Draga	III		40	1964
Vela Spilja	III		0	1966
Velnacka Glavica	III		0	1970
Veternica Spilja	III		0	1979
Vindija Spilja	III		0	1964
Visibaba	III		0	1966
Vranjaca Spilja	III		0	1963
Vrolovka Spilja	III		0	1962
Zametska Pecina	III		0	1981
Zavratnica	III		400	1964
Zlatni Rat	III		66	1965

Total surface natural monuments (ha): 640

Protected Landscapes

Name of PA	IUCN cat.	District	Size (ha)	Date approved
Badija	V		100	1969
Bijeli Potoci-Kamensko	V		1,057	1972
Brela	V		700	1964
Cetina.Kanjon	V		1,100	1963
Dolina Blaca	V		56	1995
Dubrava-Hanzina	V		350	1988
Erdut	V		160	1974
Gajna	V		480	1990
Jelas Polje	V		22,000	1995
Kalnik	V		4,200	1985
Klek	V		850	1971
Kocje	V		5	1962
Konavoski Dvori	V		525	1975
Krka-Krajolik	V		262	1948
Limski Zaljev Krojolik	V		500	1964
Modro Oko I Jerezo Desne	V		370	1974
Okic Grad Okolica	V		600	1970
Ozalj Okolica	V		500	1970
Pakleni Otoci	V		634	1968
Pican	V		571	1972
Prolosko Blato	V		1,024	1971
Rijeka Dubrovacka	V		400	1964
Rovinj Otoci i Priobalno Podruscje	V		1,200	1968
Saljsko Polje	V		240	1969
Saplunara	V		300	1965
Slapnica	V		10	1964
Slusnica	V		200	1964
Sovsko Jerezo	V		69	1989
Vidova Gora	V		1,880	1970
Zelenjak	V		50	1949
Zelinska Glava	V		?	1991
Zrce	V		150	1988

Total surface protected landscapes (ha): 40,543

Special Reserves

Name of PA	IUCN cat.	District	Size (ha)	Date approved
Babji zub Ponikve	Ia		149	1963
Banski Moravci Cret	Ia		2	1967
Bara Dvorina	IV		726	1987
Bliznec-Sumarev Grob	Ia		176	1963
Cesma	IV		47	1982
Cikola Kanjon	Ia		925	1967
Corkova Uvala	Ia		75	1965
Crna Mlaka	Ia		650	1980
Crni Jarci	Ia		133	1965
Datule-Barbariga	IV			1994
Debela Lipa – Velika Rebar	Ia		179	1964
Delta Neretve	Ia		250	1974
Don Mocvar Cret	Ia		20	1964
Draziblato	Ia		77	1969
Dubrava-Hanzina	IV			1988
Dubravice Cret i Suma	Ia		6	1966
Dugacko Brdo	Ia		11	1973
Dundo	Ia		106	1949
Durdevacki Pijesci	Ia		19	1963
Fojiska-Podprodoscica	Ia		550	1968
Glavina Mala Luka	Ia		1,000	1969
Glavotok	Ia		1	1969
Gracec-Lukovica-Rebar	Ia		23	1963
Jadro	Ia		8	1984
Japetic	Ia		29	1975
Jastrebarski Lugovi	Ia		61	1967
Kolansko Blato – Blato Rogoza	Ia		525	1988
Kontija	Ia		52	1964
Kopacki Rit	Ia		7,000	1976
Krapje Kol	Ia		25	1963
Krcic	Ia		280	1964
Limski Zaljev	Ia		600	1979
Lokrum	Ia		72	1948
Loze	Ia		110	1975
Lun	Ia		24	1963
Mali Kalnik	Ia		5	1985
Mali Bok Koromacna	Ia		900	1986
Malostonski Zaljev	Ia		4,821	1983
Markovcak Bistra	Ia		250	1963
Mikulic Potok – Vrabecka Gora	Ia		91	1963
Motovunska Suma	Ia		281	1949
Mrkan, Bobara i Supetar	Ia		38	1975
Muski Bunar	Ia		59	1963

Name of PA	IUCN cat.	District	Size (ha)	Date approved
Novakusa	IV		2	1982
Orepak	Ia		100	1974
Pod Gredom	Ia		587	1965
Prasnik	Ia		58	1965
Prud	Ia		250	1965
Prvic	Ia		7,000	1972
Pusinjak-Gorscica	Ia		187	1963
Radisevo	Ia		4	1975
Rakita	Ia		430	1969
Rauchova Lugarnica- Desna Trnava	Ia		101	1963
Ribnjak Jelas	IV		125	1995
Sekulinacke Planine	Ia		11	1966
Smerovisce	Ia		3	1986
Stirovaca	Ia		118	1965
Strmec-Sava	Ia		287	1970
Stupnicki Lug-Cret	Ia		18	1964
Tusti vrh.-Kremenjak	Ia		20	1963
Varoski Lug Suma	IV		91	1988
Varoski Lug	IV		811	1982
Velika Pljesivica-Drenovaca	Ia		156	1961
Velika Pljesivica-Javornik- Tisov vrh.	Ia		123	1961
Velika Dolina	Ia		15	1965
Veliki Pazut	Ia		700	1983
Velo i Malo Blato	Ia		155	1988
Visibaba	IV		80	1986
Vransko Jerezo	Ia		30	1983
Vrazji Prolaz i Zeleni Vir	Ia		200	1962
Vrljika	Ia		50	1971
Zapresic-Sava	Ia		243	1970
Zavizan-Balinovac	Ia		118	1971
Zrmanja	Ia		75	1964

Total surface special reserves (ha): 32,504

Total surface of protected areas in Croatia (ha): 589,690 (=6.7 % of territory)

Note: The list on protected areas in Croatia is not complete; it just gives an overview of the most important protected areas. At present, there are 352 protected areas in Croatia (Z. ŠATOVIĆ and D. MATIJEVIĆ, pers. comm.)

A.5 Romania

National Parks and Nature Parks

Name of PA	IUCN cat.	District	Size (ha)	Date approved
Munții Apuseni	V	Alba, Bihor, Cluj	37,900	1990
Bucegi	II	Argeş, Braşov, Dâmbovița, Prahova	35,700	1990
Călimani	II	Bistrița-Năsăud, Suceava, Mureş	15,300	1971
Ceahlău	II	Neamț	17,200	1971
Cheile Bicazului-Hăşmaş	II	Neamț, Harghita	11,600	1990
Cheile Nerei-Beuşnița	II	Caraş-Severin	45,561	1982
Cheile-Bicazului	V	Neamț, Harghita	11,600	1990
Cozia	II	Valcea	17,100	1966
Domogled-Valea-Cernei	II	Caraş-Severin, Mehedinti, Gorj	60,100	1982
Grădiştea de Munte-Cioclovina	II	Hunedoara	1,000	1979
Piatra Craiului	II	Argeş, Braşov	14,800	1990
Portile de Fier	II	Caraş-Severin, Mehedinți	423	1980
Retezat	II	Hunedoara	54,400	1935
Rodna	II	Bistrița-Năsăud, Maramureş, Suceava	56,700	1990
Semenic-C. Caraşului	II	Caraş-Severin	30,400	1982

Total surface national parks and nature parks (ha): 409,784

Biosphere Reserves

Name of PA	IUCN cat.	District	Size (ha)	Date approved
Danube Delta	II	Tulcea, Constanța	580,000	1991
Little Island of Braila	IV	Braila	5,336	1979
Pietrosul Mare	II	Maramureş	44,000	1979
Retezat	II	Hunedoara	38,047	1979

Total surface biosphere reserves (ha): 667,383

Botanical and Flora Reserves (selection)

Name of PA	IUCN cat.	District	Size (ha)	Date approved
Finatele Clujului	IV	Cluj	10	1932
Fântânita-Murfaţlar	IV	Constanța	66	1970

Total surface botanical and flora reserves (ha): 76

Forest Reserves (selection)

Name of PA	IUCN cat.	District	Size (ha)	Date approved
Bejan (pădurea)	IV	Hunedoara	70	1940
Beusnita	IV		100	1943
Cazanele (Danube River)	IV	Mehedinți	215	1980
Comana	IV		< 1	?
Hagreni	IV		< 1	?
Hirboanca	IV		70	1973
Letea (incl. Letea-Hăşmaşul Mare NR)	IV	Harghita	800	1938
Penteleu	IV		< 1	?
Piatra Arsa	IV		< 1	?
Seaca-Optăşani	IV	Olt	433	?
Slătioara	IV	Caraş-Severin, Suceava	1,064	1941

Total surface forest reserves (ha): 2,754

Natural Monuments (selection)

Name of PA	IUCN cat.	District	Size (ha)	Date approved
Cheile Turzii	III	Cluj	104	1938
Scarisoara Ice Cave	III	Argeş	60	1938

Total surface selected natural monuments (ha): 164

Scenic Reserves (selection)

Name of PA	IUCN cat.	District	Size (ha)	Date approved
Codrii de Arama si / Codrii de Aragint d.j.	V	Neamț	9	?
Dealul Cetății Deva	V	Hunedoara	30	?
Făgetul Clujului	V	Cluj	< 1	?
Hirsova	V		5	1965
Pădurea Bogății	V	Braşov	8.5	?
Postavarul si Timpa	V	Braşov	< 1	?

Total surface selected scenic reserves (ha): 54

Nature Reserves (selection)

Name of PA	IUCN cat.	District	Size (ha)	Date approved
Agigea dunele marine	IV	Constanța	25	1939
Agighiol geological R	IV	Tulcea	10	?
Asbesti geological R	IV	Argeş	< 1	?
Aliman locul fosilifer	IV	Constanța	15	1962
Amploita Limestone	IV		20	1954
Andreiasu de Jos eternal fire	IV	Vrancea	12	?
Baile ’1 Mai’ lake	IV		4	1932
Bila-Lala	IV	Suceava	325	1973

Name of PA	IUCN cat.	District	Size (ha)	Date approved
Bosanci	IV		24	1932
Calugari Geyser (Izbucul)	IV	Bihor	14	?
Canaraua Fetii Pădurea	IV	Constanța	168	1970
Capul Doloşman	Ia	Tulcea	125	1990
Carei	IV		10	?
Carorman	Ia		2,250	1990
Cernavodă locul fosilifer	IV	Constanța	3	?
Cetatile Ponorului	IV	Cluj	491	1955
Cheile Girlistei	IV		517	1982
Chitu-Bratcu forest	IV		1,319	1982
Ciclova-Simionu-Rolu	IV		1.327	1973
Cindrelu Izerele (lake)	IV	Sibiu	609	1982
Coastele de dune de nisip de la Foieni	IV	Satu Mare	10	1982
Corbii-Ciungi springs	IV	Dâmbovița	5	?
Cornedei-Ciungii Balasinii	IV	Maramureş	800	1977
Coronini-Bedina	Ia	Caraş-Severin	3,864	1980
Creastă Cocoşului	IV	Maramureş	50	?
Crisul Repede gorges	IV	Bihor	219	1955
De la Gaina peatbog	IV		3	?
Dealul Repedea	IV	Iaşi	6	?
Detunatele	IV		< 1	?
Doamnei stones	IV		888	1955
Dosul Laurului	IV	Arad	114	1938
Dumbrava Vadului	IV	Braşov	394	1964
Erenciuc	Ia	Tulcea	50	1990
Grindul Chituc	Ia	Constanța	2,300	1990
Grindul Lupilor	Ia	Constanța	2,075	1990
Gropul Sec (Plesu mountain, Patrunsa)	IV		1,562	1982
Hagieni Reserve	IV	Constanța	1	?
Hanu Conachi River Dune	IV	Galați	199	1940
Hărman peatbog (mlaştina)	IV	Braşov	200	1954
Iezerul Ighiel (Lake)	IV	Alba	5	1969
Intregalde Gorges	IV	Alba	355	1969
Ipotesti	IV		1,015	1975
Istria-Sinoe	Ia		350	1990
Izvorul Taussarelor	IV		< 1	?
Lacul Bilea WS	IV		120	1932
Lacul Marchelu	IV		< 1	?
Lacul Techirghiol BS	IV		< 1	?
Lăptici Turbăria	IV	Dâmbovița	15	?
Laotici	IV		1	?
Letea	Ia		2,825	1990
Little Island of Braila	IV	Braila	5,336	1979
Luci tinovul (peatbog)	IV	Harghita	273	1955

Name of PA	IUCN cat.	District	Size (ha)	Date approved
Lucina-Gaina Tinovul	IV	Suceava	1	1973
Luncă-Zamostea (pădurea)	IV	Suceava	108	?
Mălușteni fossil R.	IV	Vaslui	< 1	?
Manusoaia-Chiciu Plopii	IV		< 1	?
Middle Valley peatbog R.	IV		6	?
Miociar Porest	IV		471	1932
Mlastinile de interdune de la Sanislău Vermes NR	IV	Satu Mare	10	1982
Mohoş tinovul (peatbog)	IV	Harghita	240	?
Moldoveanu, Capra-Fagaras mountains	IV	Argeş	5,000	1966
Murighiol sărăturile	IV	Tulcea	87	1961
Nebunu	Ia	Tulcea	115	1990
Ocna Sibiului	IV	Sibiu	< 1	?
Ohaba Ponorului	IV	Hunedoara	10	?
Ormeniş (locul fosilifer)	III	Braşov	4	1955
Pădurea Hagieni	IV	Constanța	392	1970
Paring mountain	IV IV		2,000	1982
Pasunea 'Gradina cailor'	IV	Giurgiu	18	1982
Perimetrul experimental Sabed	IV	Mureş	59	1955
Periteasca-Bisericuta-Portita	Ia	Tulcea	4,125	1990
Pestera Closani	IV	Gorj	< 1	1955
Pestera Ialomita	IV		225	?
Piclele Meri Si Micci muddy volcanoes	IV		30	1955
Pietrele Doamnei	IV	Suceava	253	1955
Plopul	IV		< 1	?
Poienile Narciselor (Dumbrava Vadului)	IV	Braşov	394	1957
Poiana Stampei peatbog (Tinovul Mare)	IV	Suceava	681	1955
Polița cu Crini BotR	IV	Neamț	370	1941
Popina Island	Ia	Tulcea	98	1990
Postăvarul Muntele	IV	Braşov	1,026	1980
Răchiteaua forest	IV	Suceava	1,200	1982
Răchitişul Mare	IV	Suceava	116	1973
Racosul de Jos Geological Reserve	IV	Braşov	< 1	?
Raducu	Ia	Tulcea	2,500	1990
Red Lake Reserve	IV		< 1	?
Rapa Rosie	III	Alba	25	1969
Roşca-Buhaiova	Ia	Tulcea	9,625	1990
Rotundu Lacu	Ia	Tulcea	228	1990
Rupea (Stanca bazaltică)	IV	Braşov	9	?
Sabla Lake Reserve	IV		< 1	?
Saclin-Zătoane	Ia	Tulcea	21,410	1990
Sărături arboretele	Ia	Mureş	79	1990
Sarea lui Buzău	III	Buzău	< 1	1955
Satchinez Bird Reserve	IV	Timiş	236	1961
Seimenii Mari locul fosil.	IV	Constanța	< 1	?

Name of PA	IUCN cat.	District	Size (ha)	Date approved
Sincraieni-Ciuc peatbog	IV		1	1939
Sare Slanic Prahova	IV	Prahova	2	?
Snagov Forest and Lake	IV	Ilfov	110	1952
Suatu BotR (Fanatele)	IV	Cluj	9	1932
Iezerul Surianul (Lake)	IV	Alba	20	1969
Locul Fosilifer Suslăneşti	IV	Argeş	3.5	?
Tinovul Mohos and Lacul Sfânta Ana	IV	Harghita	240	1955
Tirighina-Barboşi locul fosilifer	IV	Galaţi	< 1	?
Valea Mare	IV	Caraş-Severin	1.179	?
Valea Mijlocie peatbog R	IV	Harghita	< 1	?
Valea Neagra	IV	Caraş-Severin	< 1	?
Valea lui David Fânețele	IV	Iaşi	50	1973
Vama Strunga	IV	Braşov	< 1	?
Vama Veche-2 Mai marine aquatorium	Ia	Constanța	5,000	1980
Varona	IV		151	?
Vătafu-Lunguleț	Ia	Tulcea	1,625	1990
Vermes	IV		60	1982
Zănoaga - Lucăcilă	IV	Dâmbovița	259	?
Zau de Câmpie BotR	IV	Mureş	3	1932
Zerind-Bustard	IV		2,200	1982

Total surface nature reserves (ha): 92,374

Total surface of selected protected areas in Romania (ha): 1,172,589

Total surface of all protected areas in Romania (ha): 1,444,525 (=6.08 % of territory)

Note: The list on protected areas in Romania is not complete; it just gives an overview of some of the important protected areas. At present, there are 848 protected areas in Romania (A. BLUMER, pers. comm.). The districts and the communes of each PA and of integrated parts of National Parks can be found in the Romanian '**Law on Protected Areas**' 5/2000.

Appendix B: List of Plants and Parts of Plants Collected

B.1 Albania (from KONSTANDIN DANO, pers. comm.)

List of MAP plants and parts collected from the wild and estimations of quantities collected in 2001 (in tonnes); modifications as recommended by D. LANGE (pers. comm.):

List of medicinal plants							
Nr	**Description**	**Quantity ton**	**Price US$/kg**	**Nr**	**Description**	**Quantity ton**	**Price US$/kg**
Flores				**Oleum**			
1	Acaciae	150		1	Salviae officinalis	5	
2	Bellidis	50		2	Satureae montanae	5	
3	Calcatrippae			3	Thymi serpylli	5	
4	Chamomillae tot.	50		4	Juniperi oxic.	5	
5	Crataegi sine fol.	50		5	Pini silves.	3	
6	Crataegi cum fol.	40		6	Origani var.vir.	1	
7	Cyani cum. cal.	10		**Fructus**			
8	Cyani sine cal.	40		1	Agni casti	15	
9	Farfarae	100		2	Coriandri	10	
10	Genistae	50		3	Crateagi	40	
11	Helianthi			4	Cynosbati tot	100	
12	Helichrysi	25		5	Juniperi oxycedri	150	
13	Lavandulae	30		6	Juniperi commu.	150	
14	Malvae silv.	110		7	Myrtilli	25	
15	Millefoli	20		8	Pruni spinosae	5	
16	Papaveri	15		9	Pyri mali	15	
17	Primulae	15		10	Sambuci nigrae	15	
18	Pruni spinosae	6		11	Sorbi aucupariae	3	
19	Sambuci ger.	15		**Aromatic**			
20	Tiliae arg.	20		1	Basilici gerebelt	30	
21	Tiliae off.	50		2	Flores Lavandulae	130	
22	Trifoli rubri	30		3	Folia Lauri nobilis	330	
23	Verbasci	25		4	Folia Rosmarini	130	
24	Violae	35		5	Folia Salviae off.	1500	
Herba				6	Folia Saturejae mont.	100	
1	Absinthi	15		7	Fructus Coriandri	10	
2	Centauri	100		8	Hyssopi gerebelt	50	
3	Equiseti	120		9	Origani var. vir. ger.	100	
4	Hyperici	140		10	Thymi serpylli ger.	100	
5	Meliloti	115		11	Thymi vulg. gerebelt	200	
6	Melissae ger.	100		12	Sideritis raeseri	30	
7	Millefoli	100		**Radix**			
8	Polygoni avicularis	120		1	Alkannae	5	
9	Pulegii	20		2	Althaeae natur	3	

10	Taraxaci	105		3	Bardanae	6	
11	Urticae	150		4	Cichorii	30	
12	Verbenae	140		5	Gentianae radix	5	
13	Visci albi	130		6	Graminis cum rad.	30	
14	Bursae pastoris	115		7	Iridis nud.	3	
15	Galegae	110		8	Ononidis	15	
16	Vinca minoris	50		9	Primulae	2	
17	Nasturti	6		10	Rusci aculeati	15	
18	Veronicae	2		11	Taraxaci	10	
Folia				12	Urticae	30	
1	Altheae	7					
2	Betulae	30					
3	Castanae vescae	30					
4	Crateagi	10					
5	Coryli	30					
7	Fragariae	15					
8	Fraxini	15					
9	Malvae silv.	30					
10	Melissae	10					
11	Myrti	10					
12	Myrtilli	20					
13	Rubi fruticosi	40					
14	Rubi idaei	20					
15	Hederae helix	20					
16	Urticae	100					
17	Visci albi	15					
18	Buxi	20					
19	Plantaginis majoris	20					

B.2 Croatia (from D. MATIJEVIĆ, pers. comm.)

The most frequently wild collected MAP species; quantities could not be estimated. The list has been slightly modified according to information provided by M. CRVENKA and D. LANGE (pers. comm.).

Achillea millefolium L.	plant without roots
Adonis vernalis L.	lowering plant
Arctium lappa L.	roots (March-April)
Arnica montana L.	flowers, leaves (before flowering), roots (only from larger plants)
Asarum europaeum L.	roots, in August
Atropa belladonna L.	leaves (June/July); roots (June-September)
Centaurium spp.	whole plant, except for roots
Colchicum autumnale L.	seeds; tubers
Convallaria majalis L.	leaves, flowers, tubers
Cornus mas L.	fruits

Crataegus oxycantha L.	leaves, flowers, fruits
Cyclamen pupurascens Miller	tubers
Digitalis grandiflora Mill.	leaves
Erythronium dens-canis L.	tubers
Fragaria vesca L.	leaves
Galium verum L.	whole plant (above ground parts)
Gentiana asclepiadea L.	roots
Hedera helix L.	leaves
Hypericum perforatum L.	whole plant (above ground parts)
Juniperus communis L.	fruits, wood
Lycopodium clavatum L.	spores; whole plant
Matricaria recutita L.	flowers
Menyanthes trifoliate L.	leaves
Paeonia mascula L.	flowers
Plantago lanceolata L.	whole plant (above ground parts)
Primula vulgaris Hads.	flowers, roots
Pulmonaria officinalis L.	whole plant (above ground parts)
Quercus petraea L.	bark; fruits
Rosa canina L.	seeds
Rubus fruticosus L.	leaves; fruits
Sambucus nigra L.	flowers, fruits
Scopolia carniolica Jacq.	roots (while flowering)
Symphytum officinale L.	roots
Taraxacum officinale L.	whole plant
Trollius europaeus L.	herb with flowers, no roots
Urtica spp. L.	whole plant
Vaccinium myrtillus L.	fruits, leaves
Viscum album L.	young branches with leaves

B.3 Romania (from A. BLUMER, pers. comm.)

The most collected MAP species from the wild together with a very rough estimation of the quantities (in tonnes):

Semen Cynosbati (seeds) – app. 800
Fructus Cynosbati (fruits) – app. 500
Folia Betulae (leaves) – app. 200
Flores Tiliae arg. (flowers) –app. 200
Fructus Crataegi (fruits) – app. 200
Flores Tiliae (flowers) – app. 250
Semen Hippocastani (seeds) – app. 150 (?)

Flores Sambuci (flowers) – app. 150
Turiones Pini – (branch tips) app. 100
Fructus Pruni spp. (fruits) – app. 90 (?)
Rhizoma Anemonae nemorosae (roots) – app. 80 (?)
Radix Petasitidis (roots) – app. 70
Allium ursinum (roots,leaves) – app.70
Semen Colchicae (seeds) – app. 60
Flores Millefolii (flowers) – app. 60
Folia Farfarae (flowers) – app. 50
Fructus Sambuci (fruits) – app.40
Fructus Hippophae (fruits) – app.50
Flores Hyperici (flowers) – app. 60
Folia Plantaginis (leaves) – app. 40
Fructus Coriandri (fruits) – app. 35 (?)
Radix Filicis mas (roots) – app.40
Arnica montana (whole plant) – app.35
Flores Tilluae spp. (flowers) – app.30
Herba Millefolii – app. 30
Cortex Frangulae (bark) – app 25
Cortes Salicis albae - 25
Radix Urticae (roots) - 25
Radix Bardanae (roots) - 25
Crataegi monogyna (leaves) – app. 30
Herba Hyperici – app. 30

Fructus Myrtilli (fruits)
Fructus Rubus idaei (fruits)

Note: the last two are picked up not only for medicinal puposes but a lot for fresh fruit supply or for food industry. (?) stands for questionable data, according to C. DRAGULESCU (pers. comm.).

Appendix C: List of MAP Species Collected in Protected Areas

C.1 Bulgaria

List provided by P. ZHELEV (August 2002) after HARDALOVA et al., 1994 and the Annual Reports of the Regional Forestry Directorates regarding the harvests of non-woody forest products.

Equisetum arvense L.
Dryopteris filix-mas (L.) Schot.
Asplenium trichomanes L.
Phyllitis scolopendriun (L.) Neum.
Athyrium filix-femina (L.) Roth.
Polypodium vulgare L.
Juniperus communis L.
Juniperus sibirica Burgst..
Galanthus nivalis L.
Arum maculatum L.
Asarum europaeum L.
Convallaria majalis L.
Achillea millefolium s.l.
Petasites hybridus (L.) Gaerth.
Solidago virgaurea L.
Tanacetum vulgare L.
Taraxacum officinale s.l.
Tussilago farfara L.
Pulmonaria officinalis L.
Sambucus ebulus L.
Sambucus nigra L.
Chenopodium bonus-henricus L.
Cornus mas L.
Arctostaphylos uva-ursi (L.) Spreng.
Vaccinium myrtillus L.
Vaccinium vitis- idaea L.
Vaccinium uliginosum L.
Centaurium erythraea Rafin.
Gentiana asclepiadea L.
Gentiana cruciata L.
Geranium macrorrhizum L.
Geranium sanguineum L.
Hypericum perforatum L.
Betonica officinalis (L.) Trev.
Melissa officinalis L.
Origanum vulgare L. ssp. *vulgare*
Thymus spp.
Allium ursinum L.
Colchicum autumnale L.
Viscum album L.
Plantago major L.
Plantago lanceolata L.
Primula veris L.
Frangula alnus Mill.
Agrimonia eupatoria L.
Alchemilla vulgaris s.l.
Crataegus monogyna s.l.
Fragaria vesca L.
Rosa canina s.l.
Rubus idaeus L.
Sorbus aucuparia L.
Galium odoratum (L.) Scop.
Galium verum L.
Digitalis lanata Ehrh.
Digitalis grandiflora Mill.
Euphrasia spp. diversa
Verbascum longifolium Ten. subspp. *panosum*
Veronica officinalis L.
Atropa bella-donna L.
Tilia tomentosa Moench.
Tilia cordata Mill.
Tilia platyphyllos Scop.
Urtica dioica L.

Appendix D: List of MAP Species Regarded Endangered in Regions or all over the Country

D.1 Bulgaria

List 1

List provided by P. ZHELEV (August 2002); the information is sourced from the Red Data Book of Bulgaria and from official orders of Ministry of Environment and Water.

Anacamptis pyramidalis (L.) L.C. Rich.
Paeonia peregrina Mill.
Cyclamen coum Mill.
Eryngium maritimum L.
Menyanthes trifoliata L.
Nymphaea alba L.
Phyllitis scolopendrium (L.) Newm. (*Scolopendrium vulgare* Sw.)
Aristolochia rotunda L.
Gymnadenia conopsea (L.) R. Br.
Vicia pisiformis L.
Adonis vernalis L.
Gentianella bulgarica (Vel.) Holub.
Sempervivum marmoreum Grab.
Ilex aquifolium L.
Meum athamanticum Jacq.
Cercis siliquastrum L.
Ligularia glauca (L.) Hoffm.
Diphasiastrum alpinum (L.) Holub.(*Lycopodium alpinum* L.)
Ephedra distachya L.
Hypericum androsaemum L.
Rhodiola rosea L.
Asplenium septentrionale (L.) Hoffm.
Hyssopus officinalis L.ssp. *aristatus* (Godr.) Briq.
Salvia aethiopis L.
Campanula lanata Friv.
Camphorosma monspeliaca L.
Oxyria digyna (L.) Hill.
Galanthus elwesii Hook. (G. maximus Vel.)
Galanthus nivalis L.
Aesculus hippocastanum L.
Laserpitium siler L.
Laserpitium latifolium L.
Tilia rubra DC.
Verbascum nobile Vel.
Verbascum pseudonobile Stoj. et Stef.
Allium ursinum L.
Pulmonaria mollis Wulf. et Horn. (P. mollissima Kern.)
Arctostaphylos uva- ursi (L.) Spreng.
Crocus pallasii Bieb.
Sideritis syriaca L. (S. taurica Steph.
Euphorbia peplis L.
Convallaria majalis L.
Valerianella coronata (L.) DC.
Colchicum autumnale L.
Pyrola rotundifolia L.
Inula aschersoniana Janka
Inula helenium L.
Glaucium flavum Crantz.
Gladiolus imbricatus L.
Gladiolus communis L.
Sideritis scardica Grsb.
Angelica archangelica L.
Angelica pancicii Vand.
Platanthera bifolia (L.) L.C. Rich.
Platanthera chlorantha (Cust.) Rehb.
Potentilla palustris (L.) Scop.
Quercus coccifera L.
Himantoglossum caprinum Spreng.
Rheum rhaponticum L.
Dictamnus albus L.
Drosera rotundifolia L.
Najas marina L.
Orchis pallens L.
Orchis coriophora L.
Orchis simia L.
Orchis mascula L.

Orchis morio L.
Orchis provincialis Balb.
Orchis ustulata L.
Orchis papilionacea L.
Orchis purpurea Huds.
Orchis laxiflora Lam.
Orchis punctulatum Stev.
Orchis tridentata Scop.
Orchis militaris L.
Orchis spitzeli Saut. ex Koch.
Samolus valerandi L.
Ruta graveolens L.
Haberlea rhodopensis Friv.
Helichrysum arenariun (L.) Moench.
Dryas octopetala L.
Atropa belladonna L.
Anemone sylvestris L.
Gentiana lutea L.
Gentiana punctata L.
Taxus baccata L.
Juniperus sabina L.
Osmunda regalis L.
Cicuta virosa L.
Alchemilla anisiaca Wettst.
Alchemilla achtarowii Pawl.
Alchemilla catachnoa Rothm.
Alchemilla bulgarica Rothm.
Alchemilla flabellata Buser.
Alchemilla fissa Gunt. et Schum.
Alchemilla gracillima Rothm.
Alchemilla crinita Buser.
Alchemilla grossidens Buser.
Alchemilla xathochlora Rothm.
Alchemilla asteroantha Rothm.
Alchemilla incisa Buser.
Alchemilla viridiflora Rothm.
Alchemilla subcrenata Buser.
Alchemilla mollis (Buser.) Rothm.
Alchemilla indivisa (Buser.) Rothm.
Alchemilla pawlowskii Assen.
Alchemilla monticola Opiz.
Alchemilla pyrenaica Dufour.
Achemilla erythropoda Juz.
Alchemilla jumrukczalica Pawl.
Rhus coriaria L.

List 2

List of medicinal and aromatic plants included in the 'List of Protected Plant Species' as laid down by the '**Law on Nature Protection**'. This excerpt has been compiled by L. EVSTATIEVA (pers. comm.); some alterations related to the current taxonomy were made by D. LANGE (pers. comm.):

PTERIDOPHYTA
Lycopodiaceae
Diphasiastrum alpinum (L.) Holub.
(*L. alpinum* L.)
Huperzia selago (L.)Bernth.
(*Lycopodiella inundata*)

POLYPODIOPHYTINA
Pteridaceae
Adianthum capillus veneris L.

Osmundaceae
Osmunda regalis L.

CONIFEROPHYTINA
Cupressaceae
Juniperus sabina L.

Taxaceae
Taxus baccata L.

CYCADOPHYTINA
Ephedraceae
Ephedra distachya L.

MAGNOLIOPHYTINA
Acanthaceae
Acanthus spinosus L.

Amaryllidaceae
Galanthus elwesii Hook.
Galanthus nivalis L.

Apiaceae
Angelica archangelica L.
Cicuta virosa L.
Eryngium maritimum L.
Opopanax chironium (L.) Koch
ssp bulgaricum (Vel.) Andr.
Cachrys ferulacea (L.) Calestani

Aquifoliaceae
Ilex aquifolium L.

Araceae
Acorus calamus L.

Aristolochiaceae
Aristolochia rotunda L.

Asteraceae
Artemisia lerchiana Weber
Helichrysum plicatum DC
Ligularia glauca (l.) Hoffm.

Boraginaceae
Alkanna tinctoria (L.) Tausch.

Campanulaceae
Campanula lanata Friv.

Crassulaceae
Rhodiola rosea L.

Droseraceae
Drosera rotundifolia L.

Elaeagnaceae
Hippophae rhamnoides L.

Ericaceae
Calluna vulgaris (L.) Hull.

Euphorbioaceae
Euphorbia peplis L.

Fabaceae
Chamaecytisus ratisbonensis (Schaeff.) Rothm.
Glycyrrhiza glabra L.

Fagaceae
Quercus coccifera L.

Gentianaceae
Gentiana lutea L.
Gentiana punctata L.

Gesneraceae
Haberlea rhodopensis Friv.

Hypericaceae
Hypericum androsaemum L.

Hippocastanaceae
Aesculus hippocastanum L.

Lamiaceae
Sideritis syriaca L.
Thymus perinicus (Vel.) Jalas.

Menyanthaceae
Menyanthes trifoliata L.

Nymphaeaceae
Nuphar lutea (L.)S. et S.
Nymphaea alba L.

Orchidaceae
Anacamptis pyramidalis (L.)
Himantoglossum caprinum (L.) Spreng.
Orchis militaris L.
Orchis papilionaceae L.
Orchis provincialis Balb.
Orchis spitzelii Saut.et Koch
Traunsteinera globosa (L.) Rchb.
(*Orchis globosa* L.)

Plumbaginaceae
Limonium vulgare Mill.

Polygonaceae
Rheum rhaponticum L.

Primulaceae
Cyclamen coum Mill.

Pyrolaceae
Pyrola rotundifolia L.

Ranunculaceae
Anemone sylvestris L.
Aquilegia nigricans Baumg.
Pulsatilla halleri (All.) Willd.
Pulsatilla pratensis (L.) Mill.
Pulsatilla slavjankae (Rummelsp) D.Jord. et Koz.
Pulsatilla vernalis (L.) Mill.

Rosaceae
Alchemilla achtarowii Pawl.
Alchemilla asteroantha
Alchemilla bandericensis Pawl.
Alchemilla jumrukczalica Pawl
Alchemilla mollis (Buser.) Rothm.
Alchemilla pirinica Pawl.
Potentilla palustris (L.) Scop.

Rutaceae
Ruta graveolens L.

Salicaceae
Salix pentandra L.

Grossulariaceae
Ribes nigrum L.

Scrophulariaceae
Pedicularis palustris L.
Verbascum pseudonobile Stoj.et Stef.

Note: This list includes both species having become rare through over-exploitation and other rare species that can potentially be used for medicinal purposes. *Arctostaphylos uva-ursi* had been protected in the old '**Law on Nature Protection**', but is not listed in the current version; however, the species will be included in the new list of '**Medicinal Plants under Restricted Usage Regime**' (L. EVSTATIEVA, pers. comm.).

D.2 Croatia

List of vascular plant species regarded as endangered in Croatia and protected by the 'Law on Nature Protection' (not all of them are used as medicinal or aromatic plants). Lists provided by Z. ŠATOVIĆ and I. DOBROVIĆ and modified by M. CRVENKA; according to M. CRVENKA, only the species indicated with an asterisk (*) are frequently collected and used as MAPs in Croatia:

Anacamptis pyramidalis (L.) L.C.M. Richard
Anthyllis barba-jovis L.
Aquilegia kitaibelli Schott
Arbutus andrachnoides Link
**Betula pubescens* Ehrh.
Centaurea ragusina L.
Cephalanthera damasonium (Mill.) Druce
Cephalanthera longifolia (L.) Fritsch
Cephelanthera rubra (L.) L.C.M. Richard
Convolvulus cneorum L.
Cypripedium calceolus L.
**Daphne blagayana* Freyer
**Daphne cneorum* L.
**Daphne laureola* L.
Degenia velebitica (Degen) Hayek
Doronicum orientale Hoffmann
Eranthis hyemalis (L.) Salisbury
Eryngium alpinum L.
**Fritillaria meleagris* L.
Gentiana acaulis L.
Gentiana clusii Perr. & Songeon
**Gentiana lutea* L. ssp. *symphyandra* (Murbeck) Hayek
**Ilex aquifolium* L.
**Leontopodium alpinum* Cassini var. *krasense* (Derg.) Hayek
**Lilium bulbiferum* L.
**Lilium carniolicum* Bern. ex Koch
**Lilium martagon* L.
Nigritella nigra (L.) Reichenbach fil.
Paeonia mascula (L.) Mill. ssp. *mascula*
**Pinus mugo* Turra
**Platanthera bifolia* (L.) L.C.M. Richard
Platanthera chlorantha (Custer) Reichenbach & Moessler
Polygala chamaebuxus L.
Primula auricula L.
Primula kitaibeliana Schott

Primula wulfeniana Schott
Quercus coccifera L.
**Rhododendron hirsutum* L.
**Ruscus hypoglossum* L.
**Scopolia carniolica* Jacuin
Sibiraea croatica Degen
**Styrax officinalis* L.
**Taxus baccata* L.
**Trollius europaeus* L.

List of MAP species regarded as endangered by wild collection as medicinal plants in Croatia according to the Red Book of Plant Taxa in Croatia (SUGAR, I. (ed.) 1994: Crvena knjiga biljnih vrsta Republike Hrvatske):

Achillea clavennae L.	MP
Adonis vernalis L.	MP
Anacamptis pyramidalis (L.) L. C. M. Reich.	MP
Arctostaphylos uva-ursi (L.) Spreng.	MP
Aristolochia cromatica Horvatic	MP (no damages to populations due to collection)
Arnica montana L.	MP
Asparagus tenuifolius	FP
Crataegus transaplina Kern.	MP, PP
Cyclamen purpurascens Mil.	MP
Digitalis grandiflora Mill.	MP
Gentiana acaulis L.	MP
Gentiana symphyandra (Murb./ Fritsch) syn. G. *lutea* L. ssp. *symphyandra* Murbeck	MP, PP
Iris illyrica Tomm.	MP
Mandragora officinarum L.	PP
Ophrys apifera Huds.	FP
Ophrys fusca Link	MP, FP
Orchis laxiflora Lam.	MP, FP
Orchis mascula (L.) L.	MP, FP
Paeonia mascula (L.) Mill.	MP, VP
Paeonia officinalis L.	MP, VP
Platanthera chlorantha (Cluster) Reichenb.	MP, FP
Scopolia carniolica Jacq.	MP
Silybum marianum (L.) Gaertner	MP
Styrax officinalis L.	PP (today less frequently collected)
Trollius europeaus L.	MP

Note: this list may contain species that are only used in homeopathy. In some species it remains doubtful, if they are used for medicinal and aromatic purposes at all (D. LANGE, pers. comm.). The list has been modified by M. CRVENKA. His comments about the use of these species are indicated behind the species' name; the abbreviations used stand for: MP=collected as medicinal plant; FP=collected as food plant; PP=collected for pharmaceutical purposes; VP=collected for using in veterinary medicine.

Appendix E: List of Legal Regulations Related to Protected Areas in Croatia

Official Gazette 'Narodne novine' Number/Year	Currently Applicable Regulations
30/94, 72/94	Law on Nature Protection
31/80, 14/88, 13/97	Law on Kornati National Park
46/83, 45/99	Law on Brijuni National Park and Memorial Ground
7/63,34/65	Law on Proclamation of 'Dundo' Forest on the Island of Rab a Nature Reserve
84/49,34/65,54/76,15/97	Law on Proclamation of Paklenica Forest a National Park
43/53, 54/76, 13/97	Law on Proclamation of Risnjak Forest a National Park
5/85, 10/85	Law on Proclamation of Bijele and Samarske stijene a Strict Reserve
24/81	Law on Proclamation of Biokovo a Nature Park
4/69, 54/76	Law on Proclamation of Hajducki and Rozanski kukovi a Strict Nature
45/67	Law on Proclamation of Kopacki rit Floodplains and Administrative Nature Reserve
5/85, 9/88, 13/97	Law on Proclamation of Krka National Park
11/90	Law on Proclamation of Lonjsko polje Nature Park
14/88	Law on Proclamation of Telascica Nature Park
24/81	Law on Proclamation of Velebit Mountain a Nature Park
29/49, 34/65, 13/97	Law on Proclamation of Plitvice Lakes a National Park
45/99	Law on Proclamation of Kopacki rit a Nature Park
24/81	Law on Proclamation of Western Part of Medvednica Mountain a Nature Park
45/99	Law on Proclamation of Ucka a Nature Park
45/99	Law on Proclamation of Papuk a Nature Park
45/99	Law on Kopacki rit a Nature Park
49/60, 54/76, 13/97	Law on Proclamation of Western Part of Island of Mljet a National Park
77/99	Law on Proclamation of Vransko jezero a Nature Park
58/99	Law on Proclamation of Sjeverni Velebit a National Park
58/99	Law on Proclamation of Zumberak and Samoborsko gorje a Nature Park
36/96	By-Law on Establishment of the public institution for Lonjsko polje a Nature Park
44/98	By-Law on Establishment of the public institution for Biokovo a Nature Park
44/98	By-Law on Establishment of the public institution for Velebit a Nature Park
118/98	By-Law on Establishment of the public institution for Medvednica a Nature Park
96/99	By-Law on Establishment of the public institution for Kopacki rit a Nature Park
96/99	By-Law on Establishment of the public institution for Vransko jezero a Nature Park
96/99	By-Law on Establishment of the public institution for Zumberak a Nature Park
96/99	By-Law on Establishment of the public institution for Papuk a Nature Park
96/99	By-Law on Establishment of the public tuion for Ucka a Nature Park
96/99	By-Law on Establishment of the public institution for Sjeverni Velebit a National Park
93/98	Rule Book on Nature Inspector's Official Identity Card
38/96	Rule Book on Internal Regulation of Kornati a National Park
77/98	Rule Book on Internal Regulation of Krka a National Park
87/99	Rule Book on Internal Regulation of Mljet a National Park
157/98	Rule Book on Internal Regulation of Paklenica a National Park

Official Gazette 'Narodne novine' Number/Year	Currently Applicable Regulations
38/96	Rule Book on Internal Regulation of Plitvicka Jezera a National Park
104/98	Rule Book on Internal Regulation of Risnjak a National Park
80/99	Rule Book on Internal Regulation of Brijuni a National Park
84/98, 29/99	Rule Book on Internal Regulation of Kopacki rit a Nature Park
84/96	Rule Book on Compensation Fees for Damage Caused by Unlawful Actions on Protected Animal Species
47/95	Rule Book on Protection of Certain Reptile Species (Reptilia)
43/95	Rule Book on Protection of Certain Bird Species (Aves)
31/95	Rule Book on Protection of Certain Mammalian Species (Mammalia)
76/98	Rule Book on Protection of Certain Amphibian Species (Amphibia)
80/99	Rule book on Protection of Amphibia (Amphibia)
115/98	Rule Book on Protection of Fungi (Fungi)
76/98	Rule Book on Protection of Leaches (Hirudinea)
76/98	Rule Book on Protection of Sea Cucumbers (Holothurioidea)
76/98	Rule Book on Protection of Cray-fish (Crustacea, Astacidae)
29/99	Rule Book on Protection of Terrestrial Snails (Gastropoda terrestria)
97/98	Rule Book on Requirements for Conducting Research on Seabed or Its Subsoil in Specially Protected Nature Parts of Internal Sea Waters and Territorial Seas of the Republic of Croatia
45/72	Decision on Proclamation of Area of Bijeli otoci-Kamensko on Licka Pljesivica Mountain a Nature Memorial and Natural Grounds Reserve
28/90	Decision on Proclamation of Crna Mlaka Area a Special Ornithological Reserve
63/94	Decision on the Management of Plitvice Lakes, Paklenica, Risnjak, Mljet and Kornati National Parks, and Telascica Nature Park
52/79, 9/85	Protective Measures and Arrangement of Special Zoological Reserve (Kopacki rit)
This list was provided by Z. ŠATOVIĆ in communication.	