BOSNIA AND HERZEGOVINA

FIRST NATIONAL REPORT ON THE IMPLEMENTATION OF THE UNITED NATIONS CONVENTION TO COMBAT DESERTIFICATION/LAND DEGRADATION IN BOSNIA AND HERZEGOVINA

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Bosnia and Herzegovina
Republic of Srpska
Ministry of Agriculture, Forestry and Water Management

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List of Abbreviations

Aarhus	Aarhus Convention
Acquis	Acquis communautaire, originally French, now generally used expression ("community achievement") for the sum of norms and standards valid all over the European Union
BIH	Bosnia and Herzegovina
CARDS	EU Community Assistance, Reconstruction, Development and Stabilisation Programme
DB	District of Brcko
EA	Environmental Agency
EC	European Commission
EPR	Environmental Performance Reviews for BIH (UN/ECE)
EU	European Union
FBIH	Federation of Bosnia and Herzegovina
GDP	Gross Domestic Product
MAP	Mediterranean Action Plans
MEAs	Multilateral Environmental Agreements
MoAFWM	Ministry of Agriculture, Forestry and Water Management (in RS)
MoAWMF	Ministry of Agriculture, Water Management and Forestry (in FBIH)
MoFTER	Ministry of Foreign Trade and Economic Relations, BIH
NCB	National Coordination Body
NAP	National Action Plan to the UNCCD
NEAP	National Environmental Action Plan
NFP	National Focal Point
NGOs	Non-Governmental Organisations
OHR	Office of the High Representative
PHARE	Support Foundation European Social Fund Agency
PRSP	Poverty Reduction Strategy Paper
REC	Regional Environmental Centre (for Central and Eastern Europe)
REReP	Regional Environmental Reconstruction Programme of South-eastern Europe
RS	Republic of Srpska
TPP	Thermal Power Plant
RBIH	Republic of Bosnia and Herzegovina
UNDP	United Nations Development Programme
UNECE	United Nations Economic Commission for Europe
USAID	United States Agency for International Development
WB	World Bank

Executive Summary

The Dayton Peace Agreement ended the war and established Bosnia and Herzegovina (BIH) as a State comprising two entities, the Republic of Srpska (RS) and the Federation of Bosnia and Herzegovina (FBIH), each with a high degree of autonomy. Brcko District was established a separate, self-governing administrative unit.

In the area of ***environment***, the BIH Medium Term Development Strategy (PRSP) relies on the priorities of the BIH National Environmental Action Plan (NEAP), which stresses the importance of strengthening the legal and institutional environment and the intersectoral approach to environmental protection issues. Steps to reduce pollution of air and water are envisaged, as well as enhancement of the systems of land management and soil protection, building of regional solid waste depository sites and rehabilitation of sites of existing illegal garbage dumps. It will be necessary to establish a system of integral land management, particularly for rural areas, in line with accepted international obligations. Over the coming medium term, the systems for preservation of the biological and geological diversity, natural and cultural heritage will be improved.

During the past few years, the country has been engaged in a quickstep legislation development process. Despite the adoption of the new Constitution since December 1st, 1995 and the voting of a number of new laws, some 50 of which are directly related to environmental issues, natural resources management, land use and agricultural practices – today's Bosnia and Herzegovina's environmental legislation is a confusing mixture of laws and regulations, and technical standards based on heterogeneous legislative and judicial provisions based on Western legislations – particularly the European Union, and the former Yugoslav Federation. This constitutes one of the main obstacles to integrated sustainable strategy and policy development, implementation and enforcement in the country.

Based on the Constitution, environmental management is not institutionalized at the state level yet, but is being carried out within the organizational structure of the entity governments, i.e. ministries on the entity level that have environmental issues in their portfolios. In Brcko District the environmental protection policy is a direct responsibility of the Government through its sectors for communal issues, agriculture and forestry. Lower level of environmental management is under the responsibility of cantonal ministries in the FBIH and municipalities in RS.

Given the situation of the economy of the country it is not realistic to expect comprehensive problem solving national environmental investment programs. At the same time, the environmental problems are so great that foreign support is needed in addition to partial domestic investments in order to stimulate and facilitate a process of economic and institutional reforms. In connection with this, it is very important to identify priority orientations for the environmental, institutional and legal system at an early stage of the development process. These priorities will be directly related to the sectors of national economy and environment.

BIH accessed the UNCCD on August 26, 2002, but due to the very difficult post-war situation, it is only now that the first steps towards implementation are being taken.

The preparations of the first national report, along with the setting-up of a National Coordination Body (NCB) are part of this process.

The NCB will coordinate interdisciplinary and inter-ministerial efforts to run the forthcoming implementation UNCCD activities under the National Strategies of BIH and the obligations deriving from it. The NCB should include representatives from a variety of stakeholders ranging from government and non-governmental institutions, from civil society representatives to grassroots resource users, academia, and the private sector, in line with the complex and interdisciplinary nature of desertification and other forms of land degradation and their diverse impacts. It is desirable that within the framework of the NCB, at least three Sub-Bodies will be created, each focusing on the primary needs as follows: a) monitoring, b) impact and vulnerability assessment, and c) mitigation and response.

During the initial phase, the NCB should make an inventory of all forms of assistance that are available from local, state and/or regional authorities at the time of severe drought, and evaluate drought mitigation programs for their ability to address short-term emergency situations and long-term mitigation actions. Assistance should be defined in a broad sense in order to include all forms of available technical and relief programs. NCB could act based on information and recommendations provided by the Sub-Bodies, and response options must be determined for each of the principal impact sectors identified by Sub-Committees; and evaluate programs at the national and regional levels to assist agricultural producers, municipalities and other stakeholders during the event of emergency. Scientists and experts from Bosnia and Herzegovina have participated in several international events, organized by ICID or other organizations aiming at mitigating the effects of drought.

The NCB will have an inter-ministerial composition with representatives from the Ministries of two entities: RS and FBIH and the Ministries of Brcko District. It will also involve representatives from relevant scientific and research institutions and organizations.

Establishment of the administrative framework for the First National Report preparation and elaboration was starting point of the National UNCCD Focal Point preparatory activities, which were to explore and collect basic data on mechanisms and activities related with the UNCCD implementation, as well as on all stakeholders that could influence this process. List of persons, to whom form was sent to, was carefully made due to the complex structure of Bosnia and Herzegovina authorities. Special care by the preparatory process for the First National Report was taken to invite following representatives: governmental authority involved in decision making process, scientists, whose field of research is related with the issues of land degradation, desertification and drought, as well as natural resources management and nature's conservation economic subjects from different sectors, such as agriculture structures in charge for the protected area's management, NGO's active in the field of land management.
Second phase of work was based on workshop's preparation. National UNCCD Focal Point contacted all invited persons once more, in order to get the final list of participants and to ask some of them, university professors of the soil science, to prepare small presentations on the land degradation issues in Bosnia and Herzegovina.

Validation workshop was held on 27th February 2007 at the Agricultural Faculty, Institute of Agroecology and Soil Sciences, in Banja Luka. Opening statement and introduction was made by of the chairman, National UNCCD Focal Point, prof. Dr. Mihajlo Markovic, who showed the presentation of UNCCD, its past, present and future, as well as its objectives, means etc.
Land issues state in Bosnia and Herzegovina was illustrated by the soil scientist prof. Dr. Hamid Custovic and than prof. Dr. Cedomir Burlica presented special features, state and management of the land on the territory of BIH. Land degradation, desertification and drought problems and legislative fundaments of the land management were presented by prof. Dr. Mihajlo Markovic. The most important

documents (National Environmental Action Plan and PRSP of BIH) were presented by Mr. Zoran Lukac, coming from the Ministry for Spatial Planning, Civil Engineering and Ecology of RS.
During the workshop very constructive discussion among the participants evolved. All of them took part in it by expressing its own opinion, mainly on obstacles and implementation possibilities. Furthermore, the discussion has the general state of land degradation, land use and land protection problems in Bosnia and Herzegovina. One could hear many, even opposite, opinions. This was an excellent opportunity to exchange experiences between scientific and research institutions and NGO's involved in land management on one side, and on the other, of the government representatives. Goals of this workshop were to get an overview of all advantages or disadvantages, as well as of all weaknesses and options to overcome them in Bosnia and Herzegovina. Standpoints of the participants on land degradation and management state were quite similar, but acceptance of the responsibilities for certain issues on this was questioned. At the end of the meeting, National UNCCD Focal Point asked all participants to fill out the previously received forms, and pointed out all necessary and important issues during the workshop.

Considering that this is the first public presentation of the situation related to UNCCD in Bosnia and Herzegovina, and the First National Report includes data from before and after the date of accession to the Convention by the country (August 26, 2002).

On the basis of the existing NEAP and other relevand documents as well as the First National Report for UNCCD we are going to prepare National Action Plan (NAP) for UNCCD, which will accepted by the Government in Bosnia and Herzegovina.

Process of NAP preparation not yet started in BIH and we need financial support for NAP preparation from GEF, UNCCD Secretariat, WB or any other donor.

Measures, taken in the Country on the implementation of the UN Convention to combat desertification/land degradation, with the essence problems dealt within each chapter of this First National Report.

I. Participatory Processes involving Civil Society, Non-Governmental and Community Based Organization

The National Environmental Action Plan (NEAP) for Bosnia and Herzegovina was completed at the beginning of 2003 supported by World Bank. Its preparation was organized according to democratic principles, with full transparency, the public participation and free access to all available information. Most importantly, the preparation of the NEAP focused on directly involving all relevant stakeholders, including representatives of the Council of Ministers, Entity and Cantonal Ministries, members of the Environmental Steering Committee (ESC), NEAP Steering Committees (NEAP SC), NGOs, local institutions, scientists, experts and private individuals.

NEAP gave impulse for development of numerous project proposals. It fell, however, short of a proper action plan as it did not designate responsible actors for the actions to be carried out. As such it gives orientation, but remains at the level of general directions and it has little effect on the distribution of functions and the structure of public administration.

NEAP was adopted at the beginning of 2003 by the entities' Governments after open public discussion. It has not yet, however, been adopted by the Assembly of Brcko District, nor has it been debated, let alone adopted, in any State body or institution.

Bosnia and Herzegovina takes part in REReP, which is the main environmental component of the Stability Pact. Funding is made available through REReP for regional and sub regional activities. The Regional Environmental Center (REC) established a country office in Sarajevo in 1997 and two field offices in Banja Luka and Mostar. It carries out a number of activities in the country, such as public information and participation campaigns, NGO capacity-building, assistance to municipalities, and support for the institutional strengthening of the entities' environmental authorities and the implementation of MEAs. REC is an important implementation partner for many of the REReP projects and, as noted above, it is a conduit for bilateral projects, too.

The norms of the Aarhus Convention, granting every citizen the right of free access to information and the right to participation in environmental decision-making are well anchored in the entities' legislation. However, a large part of secondary legislation is not yet in force. Government offices recognise their duties regarding the public information function. Most of them also designated officials in charge. However, NGOs asked, stated that the information received from the public agencies was in general not fully satisfactory. Slowness in replies and lack of staff skills are mentioned as causes. Public responsibility for environment is not well developed yet. This is demonstrated by the reportedly high rate of non-payment of municipal fees, inappropriate waste-disposal and little scrutiny of the public-private bodies responsible for aspects of environmental management. Public interest for environmental issues is small. This is also reflected in the programme of the media. Public education has not engaged itself for environment issues to a significant degree yet. An environmental communication strategy will be needed to mobilise both formal and informal education for environmental objectives and programmes.

There are 127 NGOs with a total membership of 84,676 people in the REC database for Bosnia and Herzegovina. Nearly all of these NGOs define themselves as grass-roots organizations or associations of environmental professionals. Environmental awareness raising and education are their main

activities followed by nature protection and public participation. The majority of NGOs operate locally or regionally. NGO registration and activities are regulated by the State's and the entities' Laws on Associations and Foundations. There are some NGO umbrella organizations like NGO Forum Banja Luka, Eco–network in BIH, Council of Bosnia and Herzegovina NGOs, Eco-Forum of Bosnia and Herzegovina, and Ecological Association of Bosnia and Herzegovina. For instance, Eco-Forum of Bosnia and Herzegovina was established in 2001 on the basis of an agreement of 38 different ecological societies and associations of citizens for environmental protection. Ecological Association of Bosnia and Herzegovina, registered in 2002, unites 28 NGOs from 44 towns from all over the country to promote environmental awareness. Nearly one third of the country's NGOs cooperate with NGOs from neighbouring countries. But, from the other side only one NGO until now participated in desertification/land degradation processes.

To strengthen the role of NGOs and to raise awareness, the publication "Basic Considerations for Environmental Approximation for the Non-governmental Sector in Bosnia and Herzegovina" was prepared by the local REC office under REReP project 1.9 "Capacity Building for EU Approximation in South Eastern Europe".

II. Legislative and Institutional Frameworks and Arrangements

Institutional framework

The internationally brokered Dayton Peace Agreement, which ended the war, established Bosnia and Herzegovina as a State comprising two entities, Republic of Srpska and the Federation of Bosnia and Herzegovina, each with a high degree of autonomy. Brcko District was established as a separate, self-governing administrative unit.

At the State level

Article 9 of the Law on the Ministries and Other Administrative Bodies of Bosnia and Herzegovina (Official Gazette BIH 2003), enacted in March 2003, assigns responsibilities for environmental protection to the Ministry of Foreign Trade and Economic Relations. Specifically, it gives "responsibility for operations and tasks within the jurisdiction of Bosnia and Herzegovina relating to the definition of policy, fundamental principles, coordination of activities and harmonizing the plans of the entities' governmental bodies and institutions at the international level" in agriculture, energy, environmental protection, and the development and the exploitation of natural resources.

The Ministry's Sector of Natural Resources, Energy and Environmental Protection consist of following three departments: the Department for Coordination of the Management of Natural Resources, the Department for Energy and the Department for Environmental Protection. The State and the entities are also discussing the possibility of establishing an environment agency.

The Ministry of Foreign Affairs, which is responsible for international agreements and conventions, the Ministry of Transport and Communication and the Directorate for European Integration also carry out the activities related to the environment. In addition, some independent institutions, such as the Institute for Standardization, Metrology and Intellectual Property and the Agency for Statistics, gather and publish environmental information.

To coordinate environmental matters at the State level the National Steering Committee for Environment and Sustainable Development was established in 2002 with broad participation from the State and the entities, Brcko District, non-governmental stakeholders and independent experts. Its main purpose is to facilitate work on projects and international agreements.

At the entities level (FBIH and RS)

The organization and responsibilities of environment-related ministries in the two entities are similar and prescribed by law: the Law on Federal Ministries and Other Administrative Bodies in the Federation of Bosnia and Herzegovina (Official Gazette FBIH 19/2003); and the Law on Ministries in Republic of Srpska (Official Gazette RS 70/2002).

Federation of Bosnia and Herzegovina

In the Federation, these institutions are the Ministry of Tourism and Environment and the Ministry of Agriculture, Water Management and Forestry. The former comprises the Environment Sector. It has three departments: the Department of Ecology and Environmental Impact Assessment, the Department of Biodiversity and Natural Ecosystems Conservation, and the Department of Protection of Air, Water, and Soil and of Waste Management. It has a total staff of twelve, including the Assistant Minister.

The Federation is divided into ten cantons with 84 municipalities. The Federation and the cantons are jointly responsible for the "policy of environmental protection" and for the "use of natural resources" (art. 2). These responsibilities, according to article 3, may be exercised jointly or separately, or by the canton as coordinated by the Federation. Each canton has its own constitution and government. The cantons' environmental authorities are their ministries of civil engineering, physical planning and environmental protection and their ministries of agriculture, water management and forestry. Their other ministries with environmental responsibilities are usually the ones dealing with health, industry, energy and mining (or the economy in general), labour and public welfare.

Except Ministries, Faculties and Institutes also take part in land protection activities:

- The Agricultural Faculty in Sarajevo (Institute for Soil, Agrochemistry and Land Reclamation),
- The Agricultural Faculty in Mostar (two , in East and West Mostar),
- Biotechnical Faculty in Bihac,
- The Forestry Faculty in Sarajevo,
- The Agronomic Institute of Mostar and
- The Institute for Agropedology in Sarajevo.

These institutions, directly or indirectly, act and extend their control on desertification as a part of the activity, having it as a component of their work.

Republic of Srpska

In Republic of Srpska, the relevant institutions are the Ministry of Agriculture, Forestry and Water Management and the Ministry of Physical Planning, Civil Engineering and Ecology. The Ecology Sector of the former has the staff of eight people, including the Assistant Minister. Administration is more centralized in this entity, which has no cantons, although there is a local administration in the entity's 65 municipalities. The entity is responsible, together with the municipalities, for ensuring environmental protection in accordance with the law. It is also supposed to meet the specific environmental protection needs of its citizens in accordance with article 102.5 of its Constitution.

Except Ministries, Faculties and Institutes also take part in land protection activities:

- The Faculty of Agriculture in Banja Luka (Institute of Agroecology and Soil Sciences),
- The Agricultural Faculty in East Sarajevo,
- The Forestry Faculty in Banja Luka and
- The Agricultural Institute in Banja Luka.

These institutions, directly or indirectly, act and extend their control on desertification as a part of the activity, having it as a component of their work.

Brcko District

According to the 2000 Statute of Brcko District, its Government consists of nine departments (art. 47). The Department of Utilities has a logistics unit, with one environmental specialist, directly responsible for environmental protection.

The other departments that are partially involved in environmental issues are:

- The Department of Agriculture and Forestry,
- The Department of Public Works,
- The Department of Urbanism, Real Estate Affairs and Economic Development,
- The Department of Health, Public Safety and Community Services and
- The Department of Education.

The environmental authorities in both entities are significantly understaffed. The situation does not appear to be any better at cantonal or municipal levels. The cantonal ministries have one to three environmental specialists, and the municipalities are only now developing environmental units.

Coordination

The Office of the High Representative and other international organizations have supported close coordination between the two entities, inter alia, in harmonizing their environmental legislation and adopting a joint approach to the implementation of environmental rules.

Inter-entity Steering Committee for the Environment

The Inter-entity Steering Committee for the Environment was established in 1998 specifically to deal with environmental issues delegated to it by the entities. The Committee consists of eight members. Its secretariat services are provided by the local office of the Regional Environmental Center (REC).

Inter-entity Commission for Water

The Inter-entity Commission for Water is responsible for cooperation on all water management issues among the relevant ministries of both entities. Its goal is to prevent potential disputes in water management. The Commission includes both government officials and private citizens from the two entities, as well as representatives from the donor community and the Office of the High Representative.

National Steering Committee for Environment and Sustainable Development

By decision of the Council of Ministers of 16 May 2002, the National Steering Committee for Environment and Sustainable Development was established at the State level. It has 54 members, including non-governmental organizations, scientists, universities and other stakeholders, in addition to representatives from the two entities and Brcko District. Its secretariat is located in the premises of the

Ministry of Foreign Trade and Economic Relations. Its work is largely carried out through eight subcommittees on: the protection of the ozone layer, climate change, long-range transboundary air pollution, persistent organic pollutants, biodiversity, land degradation, transboundary waters and transboundary movements of hazardous waste. The work of this Committee is improving cooperation among the State, the entities, the District and the non-governmental sector.

Policy framework

Although neither the State nor the entities have an environmental policy, some important programmes for environmental action have been prepared and adopted in recent years. The Global Framework Strategy for Economic Development in Bosnia and Herzegovina for 2001-2004 came into contact with some related issues.

The government of BIH has undertaken a number of measures aimed at improving the level and quality of environmental protection. The most important among those are related to legislation and to internal and external cooperation and coordination.

The ***National Environmental Action Plan (NEAP***), adopted by the governments of each of the two entities (and not at the State level), is a key and first document for Bosnia and Herzegovina to identify and prioritize environmental issues, and it may help international financial institutions in their decisions.

The goal of the NEAP is the identification of short and long - term priority actions and measures providing the basis for preparation of a long - term environmental protection strategy and in accordance with the economic, social and political situation in BIH. A key element of the NEAP is the comprehensive analysis of the status of the environment.

NEAP identified 8 priorities: water resource management and waste water treatment, **sustainable development in rural areas (where are land management issues)**, environmental management (information systems, integral planning and education), protection of biological and landscape diversity, waste and waste management, economy and sustainable development, public health and de-mining. **Land management issues are present and in some other priorities of NEAP (i.e. in water management are issues related on soil erosion, irrigation, drainage, flood control, etc).**
About 450 projects have already been initiated under NEAP and 50-60 of them have been selected and are in preparation phase.

Additional studies were conducted during the NEAP preparation to examine the linkages between poverty and environment, in terms of the fact that natural resources are key factor to economic growth and development for BIH.

Thus, it can be stated that NEAP have been instrumental in catalyzing cooperation between the environment and economic community in BIH.

These studies provided the basis for identifying environmental priorities and also contributed to the ***Poverty Reduction Strategy Paper*** **(PRSP),** which was also adopted subsequently.
More impact is attributed to the Poverty Reduction Strategy Paper (Mid-Term Development Strategy of BIH 2004-2007) adopted early in 2004. It is a general document addressing most economic and social issues, which covers also environment and water. Although, it follows the priorities listed by NEAP, it is more concrete in designating the necessary follow-up actions.

Land management issues are not presenting sufficient in PRSP. The main reason for it was lack of soil/land experts in its preparation.

Environmental Performance Review (EPR) The final version was approved by the Committee on Environmental Policy of the Economic and Social Council of the UN Economic Commission for Europe on October 15, 2004 in Geneva. Its 55 recommendations, which are in general consistent with the EU *Acquis Communautaire*, cover a wide range of issues.
In EPR there are e few chapters which are treat problem of land degradation and management.

Other environmental policy-making documents are the Mediterranean Action Plan (MAP), prepared under the Global Environment Facility and approved in December 1999, and the State Strategy for Solid Waste Management, prepared under the European Union (EU) PHARE Programme and adopted in 2000-2001 by the Governments of both entities but still not by the Assembly of Brcko District.

MAP is intended to promote the implementation of the Barcelona Convention and its Protocols. A review of issues related to this objective has been undertaken, and the National Action Plan drafted in January 2000.

A National Biodiversity Strategy and Action Plan for Biodiversity are under implementation now. Nature Protection Strategy is planned for realisation. There is no policy for water management and water protection.

There are also some local initiatives to develop local environmental action plans (LEAPs) in both entities. Those projects have been financed mainly by UNDP, World Bank and local authorities.

The World Bank also actively supports numerous other environment-related projects. One of the most important was the solid waste management project, which resulted in the development and approval of the Solid Waste Management Strategy 2001, which both entities have adopted.

Other projects include forest development and conservation, small-scale commercial agriculture development, local initiatives, water supply and sanitation, education development and electric power reconstruction. Also in the planning is the drawing of the institutional framework for wastewater management.

Legal framework

The BIH, as a State, the both Entities (RS and FBIH), BD and all 10 cantons of FBIH have invested legislative powers implying, that in a relatively small country, 14 authorities legislate.
Article 9 of the Law on the Ministries and other Administrative Bodies of Bosnia and Herzegovina (Official Gazette BIH 2003), enacted in March 2003, assigns responsibility for environmental protection to the Ministry of Foreign Trade and Economic Relations. The organization and responsibilities of environment-related ministries in two entities are similar and prescribed by law: the Law on Federal Ministries and Other Administrative Bodies in the Federation of Bosnia and Herzegovina (Official Gazette F BIH 19/2003), and the Law on Ministries in Republic of Srpska (Official Gazette RS 70/2002).

Laws specifically targeting the environmental sector do not exist at the state level yet. The Entities and DB have, however, prepared and partly also adopted a set of environmental laws in 2002, 2003 and 2004 respectively. These regard a) environmental protection; b) air protection; c) water protection; d) waste management; e) protection of nature; and f) the establishment of an environmental fund.

The adoption of this set of laws in both entities has been a great step forward.

For detailed List of Legislation in BIH - see Annex III: Brief Overview of Legislation in BIH.

This specifically environmental legislation is to considerable extent harmonised with the EU legislation. It introduces environmental impact assessment and strategic environmental assessment as new elements of environmental management.

III. Resource Mobilization and Coordination, both Domestic and International, including the Conclusion of Partnership Arrangements

Since the end of the war in 1995, Bosnia and Herzegovina has made progress in its international environmental cooperation at bilateral, regional, European and global levels. However, there is still important work to be done, in particular in clarifying institutional responsibilities. Some challenges, including many of those that are expressed in the Assessment on Sustainable Development in Bosnia and Herzegovina, the National Environmental Action Plan and the Mid-term Development Strategy, are of transboundary or regional importance and are being considered by the respective ministries as top national priorities. In a continuing process of stabilization and accelerated regional and international integration, Bosnia and Herzegovina will be able to continue to rely on the support of the international community. It can be expected that important cooperation programs will continue to be implemented and new ones be created, especially in the context of cooperation with the European Union.

One issue of concern is the lack of a systematic, strategic approach to international cooperation. A strategy and action plan in this area could provide a blueprint for cooperation to assist the country in identifying the bilateral and multilateral agreements most appropriate for it. Such a strategy could also help to prepare Bosnia and Herzegovina to harmonize its legislation with that of the European Union.

The State Ministry of Foreign Trade and Economic Relations, working closely with the Federation's Ministries of Physical Planning and Environment and of Agriculture, Water Management and Forestry, Republic of Srpska Ministries of Physical Planning, Civil Engineering and Ecology of Agriculture, Forestry and Water Management and the appropriate authorities in Brcko District, should develop a national strategy and action plan for international environmental cooperation consistent with the Strategy for environmental protection and sustainable development. The strategy should address the role in international cooperation of all relevant actors, including non-governmental.

Bosnia and Herzegovina has ratified or acceded many of the major multilateral environmental agreements, and the Government is actively participating in numerous international forums. However, an overall assessment of the implementation of these agreements shows that there is still much to be done in practical implementation and enforcement. One of the most important issues in this regard is institutional strengthening and capacity-building at all administrative levels. It is important to assess the cost of implementation, the most effective institutional arrangement and the importance to the country of the conventions that it has not yet ratified.

One of the most important issues in this regard is institutional strengthening and capacity-building at all administrative levels. It is important to assess the cost of implementation, the most effective institutional arrangement and the importance to the country of the conventions that it has not yet ratified.

Bosnia and Herzegovina should speed up its accession to:

- The Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters;
- The Convention on Environmental Impact Assessment in a Transboundary Context;
- The Convention on Persistent Organic Pollutants;
- The Convention on Trade in Hazardous Chemicals and Pesticides Enters into Force;
- The Convention on Cooperation for the Protection and Sustainable Use of the Danube River;
- The Convention on International Trade in Endangered Species of Wild Fauna and Flora and
- The Kyoto Protocol to the United Nations Framework Convention on Climate Change.

Bosnia and Herzegovina should also begin the process of accession to:

- The Convention on the Conservation of Migratory Species of Wild Animals;
- The Convention on the Protection and Use of Transboundary Watercourses and International Lakes and
- The Convention on the Transboundary Effects of Industrial Accidents.

Bosnia and Herzegovina has been a Party to many conventions for only a short period of time. Implementation is only beginning and has been largely directed towards reporting requirements, for which technical and financial support are available from external sources. The State Ministry of Foreign Trade and Economic Relations, working together with the national focal points, should assess the requirements for implementation of all the conventions and protocols to which Bosnia and Herzegovina is a Party. The results of this assessment should be reflected in the national strategy for international environmental cooperation.

What remains weak is the institutional capacity for implementation, including inspection and other compliance and enforcement machinery. Greater capacity is also needed in municipalities, which have responsibility for implementation too and which, in some cases, receive direct bilateral support.
Revenues from so-called "agricultural" taxes in Bosnia and Herzegovina, which are paid when agricultural lands are used for other purpose and for use of natural resources - all go to the local budgets. Except that, in government budget exist resources, which could be used for forestation. In accordance with legal requirements, this money should be spent on the environment protection.

The use of private funds is more problematic for several reasons, including the limited capacity of internal private financial institutions, as well as the issue of an important competitor - nation-wide social priorities (salaries and pensions arrears are very high in state-owned sector). So that's the reason why in BIH exist very few private foundations.

There is no list of existing sources of funding; local offices of USAID,WB, etc, as well as bilateral donors (governments of Italy, Netherlands, Norway, others) provide very important source of external special funding for environment; yet their availability for locals is still low, and requirements for project design are higher than the local capacity in most areas and Districts.

The government has not determined specific mechanisms to ensure financing for combating desertification. Moreover, it would be easy for the government in the future to allocate sufficient resources from purpose of land degradation and combat desertification problems, even if included these funds. In terms of that, the international support is very much needed.

IV. Linkages and Synergies with Other Environmental Conventions and, as appropriate, with National Development Strategies

Bosnia and Herzegovina has ratified or acceded most of the major multilateral agreements, and the Government actively participate a numerous international forums. However, an overall assessment of the implementation of these agreements shows that there is still much to be done in practical implementation and enforcement.

International agreements and conventions ratified before 01.01.1992. This is the period when SR BIH was a part of the Former SFRY (pre-war Yugoslavia). Following legal tradition and global legal rules and principles, BIH as state successor of Former Yugoslavia, should automatically become Party to those Conventions by succession.

International agreements and conventions ratified in the period 01.01.1992.-15.12.1995. This was the period of war, when R BIH ratified a number of MEAs. As an example one may take the Convention on the Protection of the Ozone Layer. By the Law on the Ratification of the Convention (Review) (Official Gazette RBIH 13/94), the Republic Bosnia and Herzegovina ratified that Convention. It regards those Conventions, the ratification of which was made during the war, and where R BIH as state successor of Former Yugoslavia became Party to the Conventions by succession:

- **The International Plant Protection Convention, Rome, 1951** (Official Gazette R BIH, No. 13/94);
- **The Convention on Wetlands of International Importance, in particular as Waterfowl Habitats,** Ramsar, 1971 by succession in 1992 (Official Gazette R BIH, No. 13/94);
- **United Nations Convention on the Law of the Sea, Montego Bay,** 1982 (Official Gazette R BIH, No. 15/95);
- **Convention on Long-range Transboundary Air Pollution, Geneva**, 1979 (Official Gazette R BIH, No. 25/93);
- Protocol to the 1979 Convention on Long-range Transboundary Air Pollution, on Long Term Financing of the Co-operative Programs for Monitoring and Evaluation of the Long-range Transmission of Air Pollutants in Europe (EMEP), Geneva, 1984 (Official Gazette R BIH, No. 13/94);
- **Vienna Convention for the Protection of the Ozone Layer**, Vienna, 1985 (Official Gazette R BIH, 25/93);
- Montreal Protocol on Substances that Deplete the Ozone Layer, Montreal, 1987 25/93);
- **Convention Concerning the Protection of the World Cultural and Natural Heritage**, Paris, 1972 (Official Gazette R BIH, No. 25/93).

In accordance with the new Law on Process of Ratification, that satisfies all political sides in BIH, six Conventions have been ratified so far:

- **United Nations Framework Convention on Climate Change, Rio de Janeiro, 1992.** This is the first Convention that BIH ratified as independent state. BIH ratified the Convention on July 20, 2000 (Official Gazette BIH 19/00);

- **Basel Convention on the Control of Trans-boundary Movements of Hazardous Wastes and Their Disposal, Basel, March 22, 1989.** BIH ratified this Convention in December 2000 (Official Gazette BIH 31/00);
- **UN Convention on Biological Diversity, Rio de Janeiro, June 05, 1992**. Decision on ratification was published in Official Gazette BIH – International Agreements No 13/02, dated December 31, 2002;
- **United Nations Convention to Combat Desertification in Those Countries Experiencing Drought and/or Desertification, Particularly in Africa, Paris 1994.** Decision on Ratification of the Convention was published in Official gazette BIH – International Agreements on August 26, 2002, No. 12/02;
- **Convention on Protection and Sustainable Use of the Danube River, Sofia, 1994.** BIH ratified this Convention in January of 2005 (Official Gazette BIH 1/05);
- **Convention for the Establishment of the European and Mediterranean Plant Protection Organization**. BIH ratified this Convention in January of 2005 (Official Gazette BIH 1/05);
- **Convention for the Protection of the Mediterranean Sea Against Pollution, Barcelona, 1976 by succession in (Official Gazette BIH, No. 26/98).**

List of international conventions and institutions with present and intended BIH participation

BIH started official procedure for accession of:

- UNECE Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters (Aarhus 1998);
- The Convention on Environmental Impact Assessment in a Transboundary Context.

BIH has still to start the official procedure for accession of:

- The Convention on the Protection and Use of Transboundary Watercourses and International Lakes, Helsinki, 1992;
- The Convention on the Transboundary Effects of Industrial Accidents, Helsinki, 1992;
- The Kyoto Protocol.

BIH signed and has still to start the official procedure for ratification of:

- Stockholm Convention on Persistent Organic Pollutants, Stockholm, 2001. BIH signed this Convention in Stockholm in 2001, but it has not yet ratified it.

During the fifth Ministerial Conference "Environment for Europe" held in May 2003 in Kiev, Ukraine, BIH signed the following three Protocols to Conventions of the United Nations Economic Commission for Europe:

- Protocol on Strategic Environmental Assessment (Espoo Convention);
- Protocol on Pollutant Release and Transfer Register (Aarhus Convention);
- Protocol on Civil Liability and Compensation for Damage Caused by the Transboundary Effects of Industrial Accidents on Transboundary Waters (Helsinki Convention).

BIH has not ratified them yet. The above list of present and intended conventions with BIH participation covers most of the agreements for which EPR recommends to speed up or to begin the process of accession.

The preparation of a number of strategies and plans in BIH is required by law. However, none of the required documents have been adopted so far. It includes the outstanding policy and strategy papers per entity. The requirement for preparation of these plans derives from the promulgation of the EU-type environmental laws and affects visibly the administrations involved. While the elaboration of the primary legislation has been produced (with the support of technical assistance), secondary legislation elaboration and implementation is largely lagging behind.

Lists of Outstanding policy and strategy papers per entities (FBIH and RS)

Federation BIH

Government of FBIH

- Implementation Plan of the Nature Protection Strategy**.**

FBIH Ministry for Physical Planning and Environment

- Federal Environmental Strategy
  - Federal Strategy for Water Protection
  - Federal Strategy for Nature Protection
  - Federal Strategy for Waste Management
  - Federal Strategy for Air Protection

FBIH Ministry for Agriculture, Water Management and Forestry

- Strategy of Water Management
- Water Management Plans for Watershed Area for Sava River and Adriatic Sea
- Strategy for Agricultural Development for 2005 - 2010

River Basin District Body

- Protection Plans for River Basin Districts

Cantons

- Cantonal Environmental Plans
- Nature Protection Plans
- Cantonal Air Quality Action Plan
- Waste Management Plans

Municipalities

- Municipal Waste Management Plans

Republic of Srpska

RS Ministry for Physical Planning, Civil Engineering and Ecology

- Strategic Plan for Environmental Protection
- Strategy on Nature Protection

RS Ministry for Agriculture, Forestry and Water Management

- Strategy of Water Management
- Water Management Plans for the Watershed Areas of the Sava River and the Adriatic Sea

- Strategy for Agricultural Development, for period: 2005 – 2015.

National Assembly of RS
- Strategy for Water Protection

Municipalities and towns
- Local Plans of Waste Management
- Local Program for Air Protection

Brcko District

- Strategy of Environment Protection
- Strategic Plan for Environment Protection

Sources of the data (main documents used):

1. **″National Environmental Action Plan (NEAP) of Bosnia and Herzegovina ″**, March 2003.
2. **″Environmental Performance Reviews of Bosnia and Herzegovina (EPR)″**, Economic Commission for Europe, Committee on Environmental Policy, United Nations, New York and Geneva (2004).
3. **Poverty Reduction Strategy Paper for BIH (PRSP) -** The Second Draft (2004-2007).

V. Measures for the Rehabilitation of Degraded Lands and for Early Warning Systems for Mitigating the Effects of Drought

Most activities in the area of land protection, as well as prevention of land degradation, are implemented in the framework of national and sectoral programs coordinated by the Ministries.

The definitions of environmental information, restrictions on its access and provisions for public participation and access to justice of the entities laws correspond generally to those established in the Aarhus Convention. The laws interpret the definition of public authority rather narrowly, however, by obliging mainly only the Environment Ministries to provide environmental information to the public and to create participation mechanisms for the public.

The Federation′s Ministry of Physical Planning and Ministry of Environment and Tourism Republic of Srpska′s Ministry of Physical Planning, Civil Engineering and Ecology should establish, without any further delay, environmental advisory councils. The council's membership and methods of work should be defined in consultation with stakeholders and in accordance with the entities Laws on Environmental Protection. As a priority, the environmental advisory councils should assist the two above-mentioned Ministries and the Federation′s Ministry of Science, Education, Culture and Sports to develop, in close cooperation with media representatives and other stakeholders, environmental communication strategies and education plans.

Rehabilitation of land use and agricultural production in the karst field Popovo polje – Mediterranean part of the country is one of important ongoing projects, which has been financed by Spanish Government and implemented by MPDL in the area of about 2500 hectares.
In first phase of this project there have been established the farm cooperatives. Within this phase, it has performed the water supply system for irrigation and planting of orchards and vineyards.

Soil research and program of rational land use and protection was completed during last year.

In both Entities it has been made the program for forestation of the karst area in the south part of country. These projects are financed by Governments funds.

Establishment of the NCB for UNCCD in B&H will have a great importance for the future development of soil protection in Bosnia and Herzegovina. It is planned, with a great help and support of the UNCCD secretariat and potential donors, to prepare NAP as soon as possible. This will be the main National Action Plan and it should cover several specific topics that are important for the country:

- Assessment of potential and active soil erosion processes in the territory of B&H,
- Assessment of drought effect in different parts of B&H and its influence on erosion,
- Protection of hilly-mountainous areas (83.5% of the national territory) from water erosion by introduction of soil and water conservation measures with sustainable agricultural development,
- Sustainable use and management of lands,
- Revitalization of the karstic (lime-stone) area that covers more than one third of national territory which is drastically eroded and decertified,
- Flood controls and land drainage of flatland in the river valleys and karstic fields that covers totally about 400,000 ha,
- Protection of high quality soils from non-agricultural use and introduction of legal regulations governing the water and soil management,
- Creation and strengthening of scientific-research institutions in order to enable them to apply the modern technologies, information systems, transfer of knowledge and education,
- Implementation of representative and experimental watersheds according to European experience for monitoring erosion processes, sedimentation and contamination in relation to land use,
- De-mining of BIH territory represents an extremely important and urgent task for social, economic and security reasons for many people.

VI. Drought and Desertification Monitoring and Assessment

According to the Assessment for Sustainable Development, before the war, about 3,000 hectares of farmland were lost annually (owing to construction, mining, flooding by man-made lakes and the construction of landfills). After the war, according to statistical records, the losses for the past two years amounted to over 10,000 hectares a year. Furthermore, the expansion of karst in Herzegovina (5-6%) and western Bosnia and Herzegovina results from the misuse of sloping land, clear-cutting of forest, improper agricultural management, etc.

As a result of the recent war, the land in Bosnia and Herzegovina is also marked by hundreds of kilometers of trenches, innumerable concrete bunkers, and craters from shells, bombs and missiles and also many agricultural lands are mined.

Providing there is not implementation of NAP in BIH, the issues of agricultural and forest land protection and controlled use are in general governed by the Laws: Laws on Agricultural Land, on Forests and on Physical Planning.

Soil desertification is not directly addressed in these Laws, but some articles define the action that should be taken to protect the land from degradation. This includes a construction ban in the protection zones, the obligatory deposition of humus land, forestation, ground leveling and grass cover after certain land works (civil constructions, mining, tree cutting) and a ban on the discharge of harmful substances (e.g. pesticides, oil derivates, radioactive material).

A very important **factor of erosion** is hydrological regime. B&H is very diversified country in terms of precipitation, potential and real evapotranspiration, water deficit and surplus (run-off and percolation). Starting from the beginning of October through the end of May, usually there is no drought in the great part of B&H. Erosion problems are present. The drought occurs normally from June to September, especially in the Mediterranean and Eastern parts of the Country.

Table 1. General situation is shown in the following agro hydrological balance (in mm):

Hydrological parameter	B&H average	South area	Central area	North area
Precipitation (P)	1200	2000	1000	800
Potential ET-PET	725	900	650	700
Real ET-RET	600	600	600	600
Water Deficit-D	125	300	50	100
Water Surplus-S	600	1400	400	200
Drought coefficient-P/PET	1.65	2.22	1.54	1.14
Outflow coefficient-S/P	0,50	0,70	0,40	0,20

Daily precipitations and high intensity rains are very frequent. In some localities daily rains even exceed 200 mm (Posusje, Jablanica). Daily rains over 30 mm are very dangerous from the erosion point of view.

Forest based natural resources in Bosnia and Herzegovina are amongst the richest in Europe in terms of the extent and variety of stock relative to the size of the country. As about 50 percent of the territory of BIH is covered by forest, these resources represent an important asset. However, the recent war and subsequent unregulated development has resulted in heavy damage at all levels. In certain areas illegal logging operations occurred, along with forest clear-cuts and degradation, which have led to the occurrence of many diseases, forest fires, ice and wind breaks. It is also important to emphasize the fact that a large portion of the forested areas are under mines, which makes any forest protection and rehabilitation activities impossible to conduct. As an overall result, the sustainability of forest management and the stability of forest ecosystems are threatened.

Excessive river and flood flows endanger about 250,000 ha of land in Bosnia and Herzegovina, some 4% of the total territory or about 60% of lowlands. High groundwater tables are present in an additional 420,000 ha of river valley land and about 300,000 ha of moderately steep or high plains. By the beginning of the war in 1992, approximately 420 km of flood protection embankments, 220 km of boundary channels, 30 pumping stations of 120 m^3/s capacity and 80 km of flood regulation channels existed. About 80,000 ha of land were thus protected with flood protection facilities with most of them located along the Sava and Neretva rivers and their tributaries with only limited protection being provided in East Bosnia.

Coal mining has a negative environmental impact: soil destruction as a result of opencast mining, land filling of overburden and washing residue from the mines. Opencast mines alone are estimated to cover approximately 12,800 ha and waste from mining operations is estimated to occupy some 6,000 ha.

VII. Access to Appropriate Technology, Knowledge and Know-How

Bosnia and Herzegovina before the war conflicts and within former country (SRFRJ) had an access to contemporary technologies and knowledge, which was of current interest in the world. And even today, B&H has a relatively well developed educational system (6 Faculties of Agriculture), and the field of ecology has been studied at most Faculties, and even the Secondary Schools). Therefore, access to knowledge and technologies in terms of communication system is relatively simple and possible. B&H has the lack of financial resources that would provide the survey and application of contemporary technologies in practice at local level, where it is only possible to provide the effects of environment protection as well as the soil. During long-standing period, it was in great measure worked on the rehabilitation and reclamation of devastated area, especially with exploitation of mineral raw materials, coal and generally with development of heavy industry with dirty technologies. In last war conflicts, acquired experiences and knowledge were completely neglected, which should be changed as soon as possible.

After the Second World War, it was very intensively worked on the preparation of the soil map of B&H in the scale 1:50 000. During almost 25-years period of terrain and laboratory survey, it was created the solid data base about the most relevant soil types in B&H.
This project is especially relevant in terms of the preparation of the spatial plans, but as well in terms of the development of the planning of land use. After the preparation of this map within forest soil science, it was as well prepared the B&H map of soil erosion in the scale of 1:25 000, and both projects have a great significance as the base for development of land use in B&H.

After the war conflicts in B&H, it was implemented a very important project of soil inventorying based upon the previously mentioned projects. Soil inventory project in B&H was financed by Italian Government, and implemented by FAO.
As project outcome, there were prepared different composite maps for whole B&H in the scale 1:250.000. In terms of that, it was prepared the soil map, geological map, map of terrain grade, precipitation map, land cover map, mine pollution of B&H territory, demining map and agro ecological zoning. Preparation of these maps has more educative than in practice significance. The most important output is the established data base according to FAO classification and introduction of this soil classification system and methods into national research practice. This project lasted from 2000 to 2004 year. Continuance of this project came in the form of its promotion with preparation of the guide, in which emphasized the participatory access to soil management and protection.
This project includes a number of municipalities in B&H, and as well implements at local level by FAO. Project is still lasting and it should be completed in this year, but to be continued its further implementation from own sources.
This project should in significant measure contribute to an adequate use and protection of soil.

VIII. Benchmarks and Indicators for Measuring Progress

Definitions: Land degradation and degraded lands are not clearly defined in the Bosnia and Herzegovina legislation. Their use is legal, procedural, and technical texts are infrequent. More frequently, documents of this kind talk of various land types (depending on the character of use, e.g. disturbed lands); their qualitative condition (e.g. eroded lands or lands with various degree of pollution); types of negative impacts and processes (inundation, soil erosion, etc.). Scientific sources do not give clear definitions either.

Classification and records: There is no commonly acceptable classification of degraded lands in Bosnia and Herzegovina. There exist several sector classifications (and their scientific basis), as well as a number of different systems of recording (inventorying) one or several types of degraded lands and soils (used by various land-inventorying agencies, drainage, peat-extracting, scientific and other enterprises).

Collection of data*:* Data on the area of various land types, as well as on their distribution, is collected by land-planning branches of local executive Institutes in cooperation with Universities: the Institute for Agropedology in Sarajevo, the Agricultural Institute in Banja Luka and the Agronomic Institute , The Agricultural Faculty in Sarajevo (Institute for Soil, Agrochemistry and Land Reclamation), The Agricultural Faculty in Mostar (two ,East and West Mostar) and Biological Faculty in Bihac, the Agricultural Faculty in Banja Luka (Institute for Agroecology and Soil Sciences) ,the Agricultural Faculty in Istocno Sarajevo, the Forestry Faculty in Banja Luka , The Forestry Faculty in Sarajevo (e.g. forestry's present data on state forest fund).

Responsibilities of Bosnia and Herzegovina in regards to environmental protection stipulated by international agreements and conventions are within the jurisdiction of the state, i.e. the Council of Ministries (Ministry of Foreign Trade and Economic Relations). A state agency that would deal with environmental issues on the state level does not exist, in the past cooperation concerning environmental issues between the two entity governments has been carried out by the Environmental Steering Committee (ESC), which has been established in 1998.

As a rule, most of the projects and surveys in this field are built on a thorough legal, procedural, and technological basis, which in turn build on sound and coordinated scientific and methodological approaches. Methods and scientific procedures for collection of data on the qualitative state of lands limiting their economic utilization without changing its purpose, are least developed. Very often narrow administrative interests and subjectivity of analysis prevail in such situations. The consumer of this kind of information in most cases has no clear picture of what he or she wants to obtain.
A relatively good methodological, procedural, technological, and technical basis exists for works on identification of eroded and radioactively contaminated lands. The procedures for other types of pollution are least developed. (For example, some types of land pollution in Bosnia and Herzegovina have even not been completely mapped). Technique assessments of the condition of those lands that are under several negative impacts at the same time have been poorly developed.

Compilation of engineering projects for nature-conservation activities*:* Forecasting, programming and project documentation for physical planning (including in that part which relates to nature-conservation) on the level of districts and other separate administrative units has become outdated and, as a rule, is not being actualized.

Thereby, all changes to the type, character and intensity of land use per each specific land plot, need to go through a complex procedure of consideration, agreement and approval. Having said this, an integrated approach to the use of land resources and development of the area is still lacking in many instances. There is a need to develop new scientific and methodological approaches to physical

planning in light of modern standards and requirements and building on a balance of ecological and economic interests, the need to conserve biological and landscape diversity, and forecast climate changes.
As a rule, technologies of rehabilitation of degraded lands using various methods (reclamation, anti-erosion and hydro technical measures, protective forest planting, etc.) are well developed per each concrete site with its concrete purpose of rehabilitation.

ANNEXES

ANNEX I: Country Profile

Bosnia and Herzegovina (BIH) is situated in South Eastern Europe, in the central part of the Balkan Peninsula and has a total land area of 51.129 km^2. The total length of its borders is 1537 km of which 762.5 km are land borders, 751 km river borders and 23.5 km sea borders. Bosnia and Herzegovina has common frontiers with Republic of Croatia (931 km), Serbia (375 km) and Montenegro (249 km). To the north, BIH has access to the River Sava, and to the south to the Adriatic Sea, at Neum. The land is mainly hilly to mountainous with an average altitude of 500 meters. Of the total land area, 5% are lowlands, 24% hills, 42% mountains and 29% karst area. Forests and forestlands cover about 50% of the territory, while the total agricultural land covers 2.5 million hectares or 0.7 hectares per capita.

The bigger part of BIH has moderately continental climate, central part is characterized with mountainous climate, and south part of BIH has influence of Mediterranean climate. With its high average annual precipitation (1200 l/m^2 compared with the European average of 1000 l/m2). Besides that amount of precipitation, east and south part of the country are exposed by drought, during long period a year. Bosnia and Herzegovina possesses significant water resources. There are seven river basins (Una, Vrbas, Bosna, Drina, Sava, Neretva with Trebisnjica and Cetina) of which 75.7% belong to the Black Sea catchment and 24.3% to the Adriatic Sea catchment. There are also a large number of river lakes (on Pliva and Una) and mountain lakes (in the area of Dinaric mountains), as well as thermal and geothermal groundwater resources.

The state of Bosnia and Herzegovina is regulated by the Dayton Agreement and comprises three separate administrative units (two entities and one district): Republic of Srpska (RS), Federation of Bosnia and Herzegovina (FBIH, divided into 10 cantons) and Brcko District.

Figure 1. Map of Bosnia and Herzegovina

1. Climate

The country is situated between the continental and Mediterranean climatic zones, which creates three local climatic areas.

The northern land territory has a moderate continental climate with warm summers and cold, snowy winters. The mountain areas above 700 m have a mountain climate with short, cool summers and long, severe winters with snow. The annual precipitation in the inland and Alpine region is between 1,500 to 2,500 mm.

The south has an Adriatic-Mediterranean climate with sunny, warm summers and short, mild, rainy winters, and an average annual precipitation of 600 to 800 mm. The average temperature in Sarajevo, in the continental zone, is -1°C in January and 20°C in July. The varying climate conditions in B&H offer wide possibilities to the agricultural production, both in terms of crop choice and cultivation of land farming, fruit-growing, vine-growing, and vegetable-growing, as well as forage crops and livestock production.

Very important factor of erosion is hydrological regime. B&H is very diversified country in terms of precipitation, potential and real evapotranspiration, water deficit and surplus (run-off and percolation). Starting from the beginning of October through the end of May, usually there is no drought in the great part of B&H. Erosion problems are present. The drought occurs normally from June to September, especially in the Mediterranean part of the Country.

Table 2. General situation is shown in the following agro hydrological balance (in mm):

Hydrological parameter	B&H average	South area	Central area	North area

Precipitation (P)	1200	2000	1000	800
Potential ET-PET	725	900	650	700
Real ET-RET	600	600	600	600
Water Deficit-D	125	300	50	100
Water Surplus-S	600	1400	400	200
Drought coefficient-P/PET	1.65	2.22	1.54	1.14
Outflow coefficient-S/P	0,50	0,70	0,40	0,20

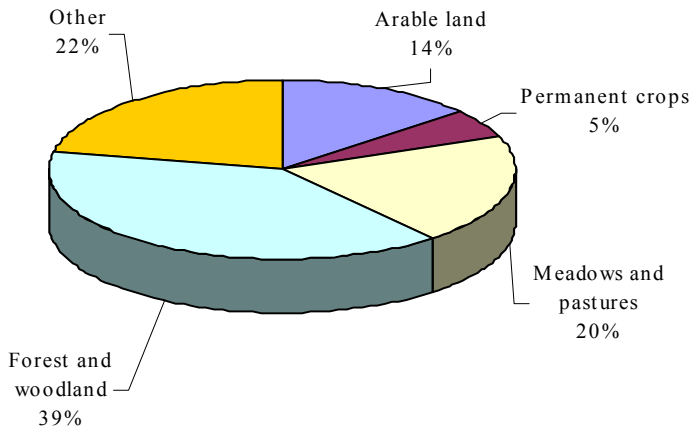
Besides, daily precipitations and heavy rains are very high. In some localities daily rains are going even to over 200 mm (Posusje, Jablanica). Daily rains over 30 mm are very dangerous from the erosion point of view.

2. Use of Land Resources

Bosnia and Herzegovina covers an area of 5,112,879 hectares of which the Federation BIH occupies 2,607,579 hectares and the Republic of Srpska 2,505,300 hectares. Around 52% (2,600,000 ha) of the total land area is suitable for agriculture with the remaining considered as forestland. Although the total agricultural land area in FBIH and RS is similar, when the population of each are considered - 2,250,000 for FBIH and 1,450,000 for RS - the division of agricultural land per capita in FBIH is at 0.56 ha whereas in RS it amounts to approx. 0.90 ha per capita. Furthermore, when the areas of fertile fields and gardens are considered, the situation in FBIH declines further and at 0.23 ha per capita is half that in RS. The various uses of the agricultural land is given in below Table 3.

Table 3. Land Use in Bosnia and Herzegovina

	FBIH (ha)	RS (ha)	FBIH (%)	RS (%)	BIH (ha)
Total area	**2,607,579**	**2,505,300**	**51.0**	**49.0**	**5,112,879**
Forest and bare land	1,500,179	1,209,590	55.3	44.7	2,709,769
Agricultural land	1,258,796	1,298,619	49.2	50.8	2,557,415
Fertile fields and gardens	508,062	671,599	43.1	56.9	1,179,661
Agricultural cultures	461,360	616,548	42.8	57.2	1,077,908
Orchards	41,395	54,358	43.2	56.8	95,753
Vineyards	5,307	693	88.5	11.5	6,000
Meadows	248,291	236,922	51.2	48.8	485,213
Pasture	502,443	358,734	58.3	41.7	861,177
Agricultural land per capita	0.56	0.90	-	-	1.46
Fields and gardens per capita	0.23	0.46	-	-	0.69



Source: USA Department of Defence 1993 est.

Figure 2. Land use in BIH

Analysis of the soil classes shows that the soil in BIH is very heterogeneous. Automorphic soils make up 86% of the total, while the remaining 14% are hydro morph soils. The content of humus in agricultural soils is approximately 50% lower than in soils covered with forest vegetation. Due to farming and treatment methods applied, the content of humus in agricultural soils shows a tendency to decline further.

Semberija, Posavina and Krajina in the North of BIH have somewhat better conditions for agricultural production with predominantly hydromorphic soils on flat and moderately undulating terrain in the valleys of the Sava River and its tributaries. The central part of BIH is a mainly hilly and mountainous region with a large portion of steep or sloping terrain. This area is covered mainly by dystric cambisols, calcocambisols on limestone and dolomites, and eluvial soil, as well as diluvial soils that are mainly covered by forests and pastures. Only a small percentage of this area is suitable for farming and results in subdivisions into very small fields. Southern parts of Bosnia and Herzegovina are dominated by shallow layers of soil on lime/dolomite substrata and with sparse covering of vegetation and rock outcrops. Only narrow strips of land located along the courses of the Neretva and Trebisnjica rivers are used for agriculture (vegetables, fruits, vineyards, tobacco).

According to the land use and soil quality classification (from I to VIII), four basic zones have been identified in the table below.

Table 4. Soil quality classification in Bosnia and Herzegovina

Zone	ha	%
I - High quality soils of I, II and III class, which are appropriate for intensive agricultural production	774,907	15.16
II - Moderate quality soils of IVa and IVb, which can be used for other purposes	1,126,520	22.03
III - Low quality soils of V and VI class, which can be used for extensive agricultural farming and out of agriculture and forest sectors	1,654,616	32.36
IV - Very poor quality soils of VII and VIII class, which can be used for a few purposes with very strong restriction	1,556,857	30.45
T O T A L	**5,112,900**	**100.00**

Forest natural resources - the basic information on the state of the forest in BIH is given in Table 5.

Table 5. Forests in Bosnia and Herzegovina

State forests	RS (ha)	FBIH (ha)	BIH (ha)
High forests	553,763	645,081	1,198,844
Low forests	259,034	260,403	519,437
Uncovered & barren lands	166,919	301,132	468,051
Total	979,716	1,206,616	2,186,332
Private forests	**RS (ha)**	**FBIH (ha)**	**BIH (ha)**
Area [ha]	229,874	293,563	523,437
Total	1,209,590	1,500,179	2,709,769
Timber stocks (m^3)			
High forests	132,717	141,776	274,493
Low forests	7,140	9,034	16,174
Total	139,857	150,810	290,667
Annual volume increase (m^3)			
High forests	3,559,400	3,850,000	7,409,400
Low forests	252,960	279,840	532,800
Total	3,812,360	4,129,840	7,942,200
Annual volume of timber harvest (m^3)			
High forests	3,336,500	3,614,000	6,005,000
Low forests	140,000	145,000	347,000
Total	3,476,500	3,759,000	7,235,500

Forest natural resources in Bosnia and Herzegovina are amongst the richest in Europe in terms of the extent and variety of stock relative to the size of the country. As about 50 percent of the territory of BIH is covered by forest, these resources represent an important asset. However, the recent war and subsequent unregulated development has resulted in heavy damage at all levels. In certain areas illegal logging operations occurred, along with forest clear-cuts and degradation, which have led to the occurrence of many diseases, forest fires, ice and wind breaks. It is also important to emphasize the fact that a large portion of the forested areas are under mines, which makes any forest protection and rehabilitation activities impossible to conduct. As an overall result, the sustainability of forest management and the stability of forest ecosystems are threatened.

Forestry in BIH is regulated differently in two entities. In RS the Law on Forests was adopted in 1994 (amendments and changes to the Law were adopted in May 2002). In FBIH the Law on Forests was adopted in 2002. FBIH has six protected forest areas (Trebevic, Prenj, Igman-jungle, Hutovo Blato, Blinsko lake), while RS has protected areas that includes two national parks ("Sutjeska" and "Kozara") and two old growth forests reserves ("Janj" and "Lom").

Figure 3. Map of forests in BIH

The major and key issues in forestry are given as follows:

Biotic and abiotic threats to forests. Bark beetle infestations started during the war and are still the major forest health problem in Norway spruce *(Picea abies)* stands, especially those stressed from war actions, drought and fires. Active control of insect population density is initiated, but of limited success. Major diseases do not normally occur in natural forests. Now, however, these are destabilized by war activities, and fires and insect attacks are causing pathological problems. There is not sufficient information on the total forest health situation. Forest fires have been frequent because of dry weather. No modern technology is available and fire fighting has to go on by hand. Grazing, and fires started on purpose to expand pastures, tends to lower the tree line in many mountainous areas. Protection of biodiversity is of concern.

Change in the primary function of forests. In the post-war period, illegal and irrational exploitation of minerals (quarries), construction of new settlements, production facilities, leisure homes, and through legal but inadequately planned construction of roads, industrial and other facilities, has permanently changed the primary function of the forests. As a result the "survival" and development of forests has faced permanent impacts.

Accessibility of forests. Due to a relatively low forest road density (about 7 meters/ha), over harvesting occurs in areas with good access with only limited harvesting taking place in areas with poor access. This has led to a significant decrease of standing volume and degradation of forest ecosystems in the most accessible areas. These areas are in addition more often prone to forest fires and insect infestations since over the last decade droughts have been more frequent.

Inadequate forest management systems. Long-term planning is important for development of the forestry sector, both in relation to forest management as well as value-added activities based on timber and non-timber resources. The forest management planning in BIH is active only at the level of Forest Management Plans and Annual Plans. A long-term program for forestry was developed for the period 1971 to 2005 but has not been revised for the past 3 decades. To meet changes in the basic criteria for planning it is necessary to revise the long-term plan, whenever changes are substantial.

Lack of culture-raising and protective measures. Insufficient capacity exists in the commercial forestry sector for seed and plant production, afforestation and silvicultural activities. In order to implement certain phases of crop improvement, it is necessary to obtain high quality planting material with known genetic background. Unfortunately, present practice, as in the past, relies upon the use of imported seeding material of unknown origin as opposed to using local stocks from the BIH genetically high quality forest stands.

Market. The lack of an economically sound forest industry capable of utilizing forest products and of providing raw materials for secondary processing is the most serious constraint in maintaining a sustainable forestry sector. The price currently being paid for poor quality logs is insufficient to maintain the forest and forest infrastructure over a long period of time.

2.1. Land Cover

Rough data on habitat category differentiation are being obtained according to the of Corinne Land Cover data base. This project has been performed by PHARE 2000. Ten main habitat categories have been identified on the basis of obtained data, as shown in Table 6.

Table 6. Land Cover of Bosnia and Herzegovina (according to the of Corinne Land Cover data base)

CLC code	Category	No. of polygons	area [ha]	% of total
111	Continuous urban fabric	3	187	0,004
112	Discontinuous urban fabric	454	49254	0,962
121	Industrial or commercial units	93	4680	0,091
122	Road and rail networks and associated land	5	166	0,003
124	Airports	6	964	0,019
131	Mineral extraction sites	106	9819	0,19
132	Dump sites	10	623	0,012
133	Construction sites	8	404	0,008
142	Sport and leisure facilities	8	442	0,009
211	Non-irrigated arable land	370	112740	2,202
212	Permanently irrigated land	2	912	0,018
221	Vineyards	23	1804	0,035
222	Fruit trees and berry plantations	81	6264	0,122
231	Pastures	2975	398001	7,772

242	Complex cultivation patterns	3034	790138	15,429
243	Land principally occupied by agriculture, with significant areas of natural vegetation	5810	616456	12,038
311	Broad-leaved forest	3679	1627297	31,777
312	Coniferous forest	1114	243747	4,76
313	Mixed forest	1757	404122	7,892
321	Natural grassland	640	184943	3,611
322	Moors and heathland	392	103650	2,024
323	Sclerophyllous vegetation	303	71083	1,388
324	Transitional woodland-scrub	2606	405794	7,924
331	Beaches, dunes, sands	6	608	0,012
332	Bare rocks	76	4820	0,094
333	Sparsely vegetated areas	512	43286	0,845
334	Burnt areas	9	587	0,011
411	Inland marshes	30	5261	0,103
511	Water courses	118	13319	0,260
512	Water bodies	44	18150	0,354
523	Sea and ocean	1	1455	0,028
Total:		**24275**	**5120976**	**100,000**

3. Water Resources

The substantial water resources of Bosnia and Herzegovina provide an important economic potential, but as with other sectors, insufficient attention has been paid in the past to the protection of water. This has been exacerbated by infrastructure damage caused by war activities and the lack of adequate maintenance. Flood control infrastructure throughout the country is damaged, outdated and deteriorated due to the war activities. The quality of potable water is still unsatisfactory in some parts of the country with pollution caused by out-dated and damaged pipelines and inadequate, poorly functioning chlorination systems. Therefore, there still remains a public health threat, especially in the rural areas where much of the potable water is supplied from individual wells. Few wastewater treatment plants exist with wastewater being discharged directly into rivers and streams.

The legislative framework for the protection of water is being put in place with the authorities of Republic of Srpska having recently passed the new Law on Protection of Water. In the Federation of Bosnia and Herzegovina, a similar law is currently undergoing the adoption procedure and until it is passed, the Law on Water dating back to 1998 is still applicable. Besides this, there are several existing Water Law regulations and by-laws in place as well as three cantonal water laws.

Water resources

Catchment areas. Bosnia and Herzegovina is found within the Black Sea catchment (75.7%) and the Adriatic Sea catchment (24.3%). Within these two, there are seven other river catchment areas: Una, Vrbas, Bosna, Drina, Sava (indirect catchment), Neretva with Trebisnjica and Cetina. The rivers from the first four flow into the Sava River, a tributary of the Danube. Neretva, Trebisnjica and Cetina drain into the Adriatic Sea.

The annual precipitation of BIH (1250 1/m^2) is high comparing to the European average (1000 1/m^2) but this is unevenly distributed with a good proportion falling in the winter months. Although the rivers are

characterized by relatively high runoff (22 l/s/km^2) there is great variation in flow and much of this (57%) leaves the territory unused. In spite of the apparent wealth of water resources, this significant spatial and time variation results in areas that experience heavy flooding in winter months and having the drought season in the summer.

Table 7. Hydrologic Characteristics of Main River Basins in BIH

River basin	Area (km^2)	Population in 1991	Mean discharge (m^3/s)	Minimum discharge (m^3/s)	Average specific runoff (Q_{avg}/A) (l/s/km^2)
Sava (nearby basin)	5,506	635,353	63	1.5	11.44
Una (in BIH)	9,130	620,373	240	41.9	26.29
Vrbas	6,386	514,038	132	26.3	20.67
Bosna	10,457	1,820,080	163	24.2	15.59
Drina (in BIH)	7,420	422,422	124	24.1	17.13
Black Sea	38,719	4,012,266	722	118	18.65
Neretva and Trebišnjica	10,110	436,271	402	56.5	39.76
Cetina (in BIH)	2,300	79,089	31	1.8	13.48
Adriatic Sea	12,410	515,360	433	538	34.89
Total in BIH	**51,129**	**4,527,626**	**1,155**	**176.3**	**22.59**

Natural lakes in Bosnia and Herzegovina can be classified as constant and periodical. The constant lakes are classified as it follows:

- River lakes, mostly on Pliva and Una rivers. They are famous by their beauty, but are not significant from the aspect of water use;
- Mountain lakes, usually of glacial origin, can be found in the Dinaric region. They cover 0.4 to 25 ha (Boracko lake) and have the volume from 10,000 m^3 to 3.5 million m^3. Their importance is in their natural beauty, mountain tourism and cattle/breeding, whilst their importance for water use is less significant.

Periodical lakes formed by flooding of karst fields during some parts of the year, can be mostly found in or near the tributaries of Adriatic Sea, i.e. Cetina, Trebisnjica and Neretva. Their total volume is about 2.5x10^9 m^3 and in hydrological terms, they are very important in respect of the extreme flood discharges in the lower karst horizons.

Water (artificial) reservoirs. There are about 27 water reservoirs in Bosnia and Herzegovina, 13 of which are in the Neretva and Trebišnjica river basins and three on the river Drina. The total useful volume of these reservoirs recorded in 1991 was 3,000 million m^3.

Ground water in Bosnia and Herzegovina can be found in three geographically separate areas each with special characteristics. In the northern parts, the ground water reserves are within alluvial sediments of unequal mechanical composition along the Sava River and its tributaries at a depth of about 50 m. Capacities in excess of 1 m^3/s are found in Semberija and Lijevce Polje regions, with Artesian water found at depths of 100-200 m. In the central parts of BIH, groundwater accumulates in the caves and cavities of the limestone massifs and emerges on the surface as lime wells in the Una, Sana, Bosna, Drina and Neretva river basins. The southern parts of BIH belong to the Adriatic Sea catchment area and comprise large karst fields. The important wells are found in the Cetina, Neretva and Trebisnjica river basins.

Water use

Water supply. Drinking water supply services cover only 56% of FBIH and 48% of RS, compared with over 90% in Europe. Potable water in cities is supplied from: groundwater (47%), wells and springs (27%), surface sources (20%), whereas the remainder comes from infiltration. Some of the extracted water is of very good quality to meet the potable water requirements without treatment. Other sources require full treatment although they are sometimes only disinfected. Gross specific consumption in most urban water supply systems ranges from 200 to 600 liters/capita/day. Of this, about 100 to 200 liters/capita/day is used for the supply of the population with the pattern of use being made up of 32% for household use, 35% for business and other uses with 33% on average being lost.

Some water supply systems are unable to meet the needs of consumers during the dry season. Not only is the quantity insufficient, but also in many cases the quality requirements are not met. This is either due to inadequate seasonal water resources or the insufficient capacity of all or parts of the water supply systems. Additional problems arise from the lack of water protection for sources, facilities and springs.

Water resources are under potential threat from organic pollution resulting from the inadequate direct protection and also insufficient wastewater treatment plants. Other threats come from inadequate maintenance of sewage systems, intense exploitation of forests, uncontrolled use of pesticides, etc. In most cases water sources are not bacteriological safe.

Use of water for hydro power production (hydro energy). The total hydropower potential of Bosnia and Herzegovina is 6,100 MW mostly located within the Drina, Neretva and Trebisnjica river basins. Only about 38.75% of this is utilized and this meets approximately 40% of the total electricity production. Additional unused potential that has already been studied exists in these river basins and is greater than in all other river basins.

Irrigation. The total arable land of Bosnia and Herzegovina is about 1,123,000 ha of which only about 2% is irrigated. This is low, considering the world average of 15%, but is due to both the unfavorable topography and the spatial differences between demand and supply. In the karst areas of Herzegovina the percentage irrigated is higher with up to 6-7% of arable land being irrigated. The potential for irrigation has been examined and more than 154,500 ha have been identified as suitable for irrigation in Herzegovina, Semberija, downstream of Vrbas River, Dubicka Ravan and Srednja Posavina.

Internal river traffic. The Sava River forms the border with Croatia and Yugoslavia and water traffic is possible along the whole length of 332 km. On other rivers in Bosnia and Herzegovina, water traffic is only possible on the Una river for about 4.0 km. Water traffic is planned along river Neretva between Capljina (BIH) and Metkovic (Croatia).

Industrial water use. Industry in BIH uses water partially from the public water supply system and partially from its own sources. Both sources have been damaged by the war and are still in a very bad condition, especially the industries own water intakes, due to the downturn in the BIH economy and the decrease in industrial production.

Use of mineral and thermal water. Bosnia and Herzegovina has rich mineral water resources, but has only developed these to a limited extent. Mineral and thermal water has good economic potential especially in the areas of eco-tourism and health care. Some investments were made in this sector before the war (e.g. "Hotel Reumal" and "Medical rehabilitation center" - Fojnica, Banja Vrucica - Teslic) but little has been done to repair them after the war and no new investments have been forthcoming.

Fishing and fish farming. Around 3,570 ha of fishponds for carp, with a capacity of 1,000 to 1,100 kg/ha, exist in Republic of Srpska. The topography in the vicinity of the rivers would permit the construction of

more fishponds and estimates have put the potential at about 4,450 ha. Some large and a number of smaller private fishponds are found in FBIH and these are used mostly for breeding of trout, carp and sheatfish. There is still considerable scope for expansion of fish farming in Bosnia and Herzegovina for breeding of trout, carp, sheatfish and some other breeds offish, in spite of numerous technical problems.

Water quality protection

Wastewater discharge. Most wastewater (almost 90%) is released directly without treatment into the nearest rivers, streams and underground channels. Around 56% of the urban population is connected to sewerage systems. For settlements with a population of more than 10,000, the extent of coverage rises to 72% whilst for smaller settlements this decreases to about 10%. In many cases the sewerage systems have not been completed, often only partially designed and constructed, and in some locations their capacity is insufficient to receive storm waters. Maintenance is mostly inadequate and there are still no regulations or legislation for these activities. Overflow from the systems occurs in the rainy season and affect around 65% of municipal centers. The problems lie not only with the failure to complete the systems as originally planned, but also to rectify war damage. Some parts of the systems thus require replacement of the damaged areas and about 850 km of the pipelines require cleaning.

Only seven cities with a population in excess of 5,000 inhabitants in Bosnia and Herzegovina had treatment systems before the war. These were Sarajevo, Trebinje, Trnovo, Ljubuski, Grude, Celinac and Gradacac and the total capacity of these wastewater treatment plants was 700,000 PE (Population Equivalent). Since the war a treatment plant has been constructed in Srebrenik. Out of the above treatment plants, only the plants in Sarajevo and Trnovo are still not functioning due to war damage. In addition to the above urban systems, there were also 122 plants for treatment of industrial wastewater. Forty percent of these worked successfully but none are in use due to the economic collapse and lack of equipment.

In 1991, the pollution load in BIH was approximately equivalent to a population of 9.5 million people although the population was only 4.5 million. Industrial wastewater load accounted for most of this and was equivalent to pollution generated by a population of 6.8 million. At the same time, the municipal wastewater load was equivalent to a population of 2.7 million. That is why the majority of rivers in Bosnia and Herzegovina were very polluted, some up to class IV of quality, with the Bosna and Vrbas rivers being the most polluted. At present the wastewater load is considerably lower as industry is not operating as before the war, but it is still disproportional high, as wastewaters are not treated.

Pollution of water by wild dumpsites*.* Water in Bosnia and Herzegovina is being polluted by direct disposal of waste into rivers and very close to watercourses. This has been identified as a significant problem in several locations in BIH. These include Samac, Sava river alluvium (where the spring sources for the city drinking water supply are located), Bijeljina, Modrica, Gorazde, and Visegrad. In addition, the drinking water springs for cities Ljubinje, Bileca and Trebinje and some others are being affected by the TPP Gacko tailings causing leachate from upper horizons to leach into the springs.

Uncontrolled deforestation and soil erosion. Uncontrolled deforestation, erosion of soil and mountain streams have special implications for the water sector, reflected through (I) lack of biologic potential and increased erosion of karst, (II) creation of alluvia and sludge that results in reduced capacity and increased risk of flood and pollution of water.

Introduction of pesticides and nutrients*.* There is no valid information on the degree of pollution of ground and surface water in Bosnia and Herzegovina by pesticides. Fortunately, pesticides are not in wide use. It is expected that their use will increase with development of agriculture and it will therefore

be necessary to ensure that appropriate protection measures are introduced. Relatively speaking, lower nutrient concentrations are recorded in Una, Drina, Vrbas and Trebisnjica river basins. High concentrations of phosphorus and ammonium are found in Ukrina River and all profiles of river Bosna and its larger tributaries.

Water quality and monitoring

Systematic surface water quality testing and analysis in BIH were undertaken since 1965 at 58 locations. However, the complete monitoring system was destroyed during the war and establishment of new monitoring stations relies upon appropriate human and financial resources. With the available resources, the monitoring network is being gradually rehabilitated to cover both water quality and quantity monitoring.

Protection from flooding

Excessive river and flood flows endanger about 250,000 ha of land in Bosnia and Herzegovina, some 4% of the total territory or about 60% of lowlands. High groundwater tables are present in an additional 420,000 ha of river valley land and about 300,000 ha of moderately steep or high plains. By the beginning of the war in 1992, approximately 420 km of flood protection embankments, 220 km of boundary channels, 30 pumping stations of 120 m^3/s capacity and 80 km of flood regulation channels existed. About 80,000 ha of land were thus protected with flood protection facilities with most of them located along the Sava and Neretva rivers and their tributaries with only limited protection being provided in East Bosnia.

The existing facilities provide a good basis for further protection works, but there are insufficient pump stations and density of the canal and embankment network to protect all of the agricultural land. Repair of the existing systems is now needed and in addition, further expansion is also required. At present there are no reservoirs that are used to assist with flood protection and the transformation of flood flows. In addition, the level of protection and return periods used varies from area to area. For large rivers, return periods of 20 to 100 years are used.

Problem identification and analysis

Based on the above, the problems and their causes identified in the water sector in BIH are:

- Inadequate water supply to the population and industry;
- Inadequate protection of springs;
- Lack of treatment of municipal and industrial wastewaters;
- Numerous wild dumpsites are not remedied and are supplemented with new ones created often close to water sources and watercourses;
- Preventive measures are not applied;
- Frequent incidental pollution of water resources;
- Inadequate flood protection - unregulated river flows, floods, disasters;
- Erosion of surface soil and landslides.

The causes of such problems are:

- Lack of an integrated water management system;
- Lack of an integrated water management strategy;
- Lack of development plans and coordination on all decision-making levels;
- Non-harmonized legislation;
- Insufficient finances;
- Lack of information systems;

- Non-compliance with existing legislation;
- Lack of trained staff, equipment and institutions;
- Destroyed or damaged infrastructure (water supply and sewage);
- Large losses from the water supply systems;
- Insufficient wastewater treatment plants;
- Lack of monitoring systems;
- Deforestation and soil erosion;
- Irrational use of water on all levels;
- Inadequate water pricing and low collection rate, resulting in a weak financial base for water companies;
- Lack of research and training activities at all levels.

4. Energy sources

Consumption of energy has declined considerably since the beginning of war. In 1991, average energy consumption was about 73 GJ/capita; in 2000, it had fallen to some 45 GJ/capita. The pre-war level was slightly above the world average (1991; 69 GJ/capita), but by 2000 this had fallen to well below the world average of 70 GJ/capita (developed countries had an average of 236 GJ/capita). The drop is attributed mainly to the sharp decline in industrial output and in general economic activity. The years after the conflict show a recovery, but considerable development is still required.

Coal

The coal reserves of Bosnia and Herzegovina are estimated at around 10 billion tons. They are mainly located in three basins: Tuzla, Central Bosnia, Ugljevik and Gatacko polje. Only lignite and brown coal are extracted, and hereinafter coal refers exclusively to lignite and brown coal. Over 80% of current production comes from these basins. Mines are mainly developed for two purposes: supply of coal to the thermal power plants and supply for a broad market, including export. Coal production (see table 8) has declined since the war.

Coal is predominantly produced in opencast mines. Before the war two thirds of the coal in the Federation and 95% of the coal in Republic of Srpska was produced in opencast mines. Most is used for power generation: in 1990 about 70% (ca. 11.2 million tons) and now around 80% (ca. 7 million tons).

The balance is used for domestic and industrial purposes and some is exported. Coal production is expected to remain at its current level, or slightly increase over the next 10-15 years. The sector is at the same time expected to be restructured to enable production to be maintained, while decreasing the number of employees from 15,000-16,000 to about 3,500. This will require substantial investments in the modernization of the mining operations.

Table 8**.** Coal production (millions tons)

	1990	**2000**
Total in BIH	12.0	8.8
Federation of BIH	8.0	5.5
Republic of Srpska	4.0	3.3

Source: Mid-term Development Strategy, Annex IX. Energy Sector Priorities. December 2002.

Oil and oil derivatives

Bosnia and Herzegovina has no proven resources of oil or gas, even if research surveys before the war indicated promising deposits.

Its refinery capacity is located in Republic of Srpska. It consists of one refinery for the processing of crude oil into various petroleum products, such as motor fuels and fuel oil, and another processing facility for the production of motor oils and special-purpose lubricants. Both processing facilities are operating at low capacity, ca. 25% of their pre-war level. As the domestic processing capacity is insufficient, refined petroleum products are imported.

Natural gas

Natural gas is imported from the Russian Federation (Gazprom), via Ukraine, Hungary and Serbia and Montenegro, and distributed by four distributors, two in each entity. Distribution is relatively limited and stretches only from Zvornik where gas enters from Serbia and Montenegro, to Sarajevo and Zenica. The main consumption centers are Sarajevo and the industrial works in Zenica. The system is designed for approximately 1 billion m^3/year, and current leased transport capacity to the border is around 750 million per year. Before the war, annual consumption was above 600 million m^3, and rising. Now consumption is down to between 150 and 200 million m^3, primarily owing to reduced industrial activity. The shift in gas consumption from industry to residential use has also led to considerable seasonal variations in gas consumption, which is resulting in a less-than-optimum use of the infrastructure. To address the problem, the country is taken steps to extend the capacities in the Steel Company Zenica and the Coke Factory Lukavac.

The development of a regional energy market in South-East Europe is expected to lead to the development of a natural gas supply system in Bosnia and Herzegovina, with the possibility of new supply routes and an extended distribution system.

Alternative energy sources

Bosnia and Herzegovina could use alternative energy sources. These are, except for hydropower and some biomass, not developed largely. Furthermore, there are few reliable data and studies on their actual potential. Possible alternative sources are:

- Wind power: there are several locations with favorable wind conditions in the country. A survey of the potential for establishing wind farms is planned with international assistance. Preliminary estimates indicate a technical potential of wind power of up to 50 MW_e i for the period up to 2020.
- As solar radiation in Bosnia and Herzegovina is among the highest in Europe, solar energy could provide a substantial input, for heating, hot water and power generation. No assessment of the overall solar energy potential is available.
- Geothermal energy is traditionally used for spas in the region. Use on a larger scale could substantially help the heating sector and possibly, depending on geological conditions power generation. Based on existing wells, the potential for home heating and similar, relatively low-temperature purposes has been assessed at 30-35 MWth, while the potential for electricity generation is considerably lower. Private companies are currently investigating a possible commercial use for geothermal energy in the Sarajevo Region.
- Energy from biomass plays locally a large role in the form of firewood for heating and other domestic purposes, particularly in rural areas. However, the sector has a far bigger potential,

as Bosnia and Herzegovina has a relatively developed forest industry, including sawmills and wood processing. Residues from industry and selected residues from forestry operations that today are dumped or burnt in the open are potentially an important energy source.

Energy conversion and use

Currently, Bosnia and Herzegovina has three vertically integrated power utilities, which each have a monopoly in their distribution areas:

- Electricity Company of Bosnia and Herzegovina (Elektroprivreda Bosne i Hercegovine - EPBIH);
- Electricity Company of the Croat Community Herzeg-Bosnia (Elektroprivreda Hrvatske Zajednice Herceg-Bosne - EPHZHB; and
- Electricity Company of Republic of Srpska (Elektroprivreda Republike Srpske - EPRS).

Each company has its own generation, transmission and distribution facilities; the Common Electricity Coordination Centre (ZEKC), jointly owned by the three power utilities, coordinates dispatching and ensures the system's integrity.

In the former Yugoslavia, Bosnia and Herzegovina's power system was developed to supply power to other parts of the country; it therefore has strong links to neighboring countries. Furthermore, the country will, like all other countries in South-East Europe, be connected to the single European electricity market in 2005 or 2006 and intends to participate in supplying green electricity (through a green certificate system), generated by renewable energy sources, in accordance with EU Directive 2001/77/EC on renewable. This will encourage the country to improve its energy mix by developing domestic renewable energies, but it will also require new legal provisions that provide for green certification. At the moment, no such mechanism exists.

Even though the transmission system is not fully rehabilitated, considerable power exchange is taking place in the region. The transmission system will be rehabilitated by the end of 2005 Power production facilities comprise hydropower plants and thermal generation plants using local coal. The division of production between hydropower and thermal generation varies from year to year depending on rainfall, with a potential of about 50% of current generation coming from hydro-sources. The power plants as well as the transmission and distribution system were severely damaged during the war, as evidenced by the very low production rates. After the war, the World Bank, EBRD and bilateral financing institutions invested considerable sums into refurbishment and rehabilitation. Now the newer units of the thermal power plants are in relatively good operating condition, while the oldest units have, in principle, been retired. However, even the most modern units are inefficient. The most efficient units, Ugljevik and Gacko, have heat rates of about 11,500 kJ $_{fuel}$/kWh $_{electricity}$, which corresponds to an electric efficiency of 31%. Large modern units may have electric efficiencies of 35-40%, even with the relatively low calorific value coal qualities at hand in Bosnia and Herzegovina. The current utilization levels of the thermal plants is relatively low compared to installed capacity; the produced energy corresponds to only between 3,500 and 4,000 hours of full-load operation, or some 50-60% of practicably possible production. Hydropower generation, transmission and distribution have similarly been rehabilitated with assistance from the international community.

The final rehabilitation of the transmission systems will make it technically possible to increase power exports from Bosnia and Herzegovina. This is an opportunity for the country to boost its export earnings. It will also increase the pressure to better use the existing thermal generation capacities and to develop new capacity, in both thermal generation and hydropower.

Bosnia and Herzegovina has a large potential in both hydropower and thermal generation based on coal. The untapped hydropower potential is 6,000 MW above the generation capacity, i.e. more than 22,000 GWh a year. Several new hydropower projects have reached relatively advanced stages of design, and the power companies are looking for international financing for their realization. Some thermal generation projects based on local coal have also reached advanced planning stages.

Energy intensity and efficiency

Per capita energy consumption in Bosnia and Herzegovina is, as stated above, low, both compared to the world average and certainly in comparison to developed countries. Consumption of electricity is also below the world average: in 2000 it was 1,915 kWh/capita, while the world average was 2,243 kWh/capita and the OECD average 8,089 kWh/capita.

An indication of the overall efficiency of energy use is the energy intensity ratio of primary energy supply (in, for instance, tons of oil equivalent (TOE)) to GDP (in, for instance, US$), that is, how much energy is used to create one unit of GDP. Recent developments in Bosnia and Herzegovina and a comparison with other countries are shown in table 9.

Table 9. Energy intensity (TOE per thousand "1995 USD" GDP)

	1991	**1997**	**1998**	**1999**	**2000**	**2001**
BIH	-	0.615	0.701	0.618	0.718	0.678
World average	0.326	0.308	0.304	0.301	0.297	0.259
European Union	0.167	0.158	0.157	0.153	0.149	0.150
Croatia	-	0.369	0.372	0.366	0.344	0.337
Albania	0.931	0.399	0.411	0.581	0.549	0.525

Source: International Energy Agency, http://www.iea.org. 2003.

The relatively bad starting point in 1991 has been further worsened by low capacity utilization, damage from the war and neglected operations and maintenance. Generally, efficiency in energy generation as well as in end-use is low.

It is worth noting that the efficiencies in comparable countries in the region, such as Croatia and Albania, have developed considerably more favorably than in Bosnia and Herzegovina. This may be partly explained by their better economic development, but may also be attributed to their faster development of institutions fostering energy efficiency and incentives to save energy. Furthermore, it is apparent that Republic of Srpska uses energy considerably less efficiently than the Federation.

Environmental impacts from energy

Coal mining has a negative environmental impact: soil destruction as a result of opencast mining, land filling of overburden and washing residue from the mines. Opencast mines alone are estimated to cover approximately 12,800 ha and waste from mining operations is estimated to occupy some 6,000 ha. Furthermore, effluent from the washing of coal and other mining operations as well as leaks from dumps are polluting water bodies and threatening groundwater, because effluent treatment plants are virtually non-existent.

The thermal generation plants are big polluters. The energy sector is at present the country's main air polluter. The energy sector in the Federation of Bosnia and Herzegovina emits between 65 and 90% of all SO_2, NO_X and CO_2 emissions to the atmosphere. Before the war, heavy industry, such as the chemical or steel industry, was a major air polluter. Many of these factories are today closed, which is why the thermal power generation can be assumed to be the biggest air polluter.

Similar data from Republic of Srpska were not available, but it is assumed that the situation is largely the same as in the Federation.

As previously mentioned, a comprehensive modernization and refurbishment programs has been undertaken at a number of thermal generation plants with international financing. Some of the improvements brought about are:

- The Tuzla power plant has reduced total dust emissions to 20-25% of its pre-war levels, at unit 3 from 800 to 100 mg/Nm^3 and at unit 4 to around 70 mg/Nm^3;
- It has also cut the NO_X emissions from unit 3 to 400 mg/Nm^3 and from unit 4 to some 350 mg/Nm^3;
- Dust emissions at the Kakanj power plant have fallen to about 150 mg/Nm^3;
- Emissions are monitored continuously at the major production units.

Generally, the dust and NO_X emission values presented for the rehabilitated units are in line with current EU legislation for large combustion plants (Directive 2001/80/EC). Sulfur emissions have not been tackled so far. The local coal generally has a moderate sulfur content calculated by weight, but total sulfur emissions will nevertheless be substantial as much fuel is required due to its low calorific value and high ash content. Desulphurization equipment is planned for some generation plants, but funding may not be forthcoming.

Despite its efforts to cut emissions, the power generation sector continues to be the major source of air emissions. The energy sector supposedly refers primarily to power generation. Substantial emissions are likely from domestic heating (see the section on heating); therefore, total emissions are probably substantially higher than indicated. Even the levels presented here are high, considering the country's comparatively small energy sector.

In addition to the impact on ambient air, the power generation sector emits pollutants to water, mainly from the handling and treatment of ash and slag. These effluents have so far been discharged untreated into rivers. Now some plants have been modified to use a system of dry ash handling, which in addition to reducing the effluents facilitates the use of ash as a raw material in the cement industry. In recent years about 400 tons of ash from the Tuzla power plant has been used at the nearby Lukavac cement factory.
The disposal of ash and slag is another major environmental concern related to the power sector. Ash and slag are estimated to occupy about 600 ha in total, and, even if no evidence has been found, leaks and effluent from these sites may threaten groundwater and surface water. Moreover, if improperly managed, this disposal may also create dust, which could become a local environmental and health problem.

The individual heating of houses and apartments uses mainly local fuels such as coal and firewood. Combustion is generally poor, generating substantial local emissions to air, which in wintertime create a considerable health problem. It is unclear if emissions from the heating sector are included in the available emission estimates. The reported emissions from the energy sector supposedly relate mainly to power generation, and possibly also the larger district heating plants.

Individual heating installations and small and medium-sized block heating plants probably also create emissions, which are largely unaccounted for in the statistics.
Existing hydropower plants have a relatively limited impact on the environment provided that they are properly maintained and operated. New hydropower developments may have considerable negative environmental consequences, including diverse effects on biodiversity and tourism. The damming of rivers for small and large-scale hydro applications may have a significant environmental impact. Firstly, it affects the migration of fish and disrupts their spawning habits. Secondly, it leads to the flooding of valleys that often contain wilderness areas, residential areas or archeologically significant remains. Moreover, there are also concerns about the consequences of disrupting the natural flow of water downstream and disrupting the natural course of nature. On a more positive note, the reservoirs behind dams are valuable recreation areas and dams assist in flood control, thereby preventing economic hardship to local agriculture and municipalities. Bosnia and Herzegovina is now requiring an environmental impact assessment for all new hydropower projects.

5. Types of Land Degradation, Management and Protection of Land Resources

Land use changes and losses of agricultural land are resulting from sudden urbanization, industrialization and changes to commercial developments involving the introduction of new technologies. The most important and most frequent causes of the reduction in available agricultural land are given in Table10.

Table 10. Most Frequent Loss of Agricultural Land in BIH (Estimation)

Cause of loss of agricultural land	Lost area (ha/year)	Lost area (%)
Surface pits	900	30
Landfills	300	10
Residential zones	600	20
Water accumulation	300	10
Roads	300	10
Industrial facilities	300	10
Erosion, landslides, etc.	300	10
Total	**3,000**	**100.00**

Moreover, for a better understanding of the impact in the change of land use on land resources, it is useful to compare the ratio of different categories of land use per inhabitant (Table 11) and the relative elevation of the available agricultural land (Table 12).

Table 11. Ratio of Use of Land

Category	ha/Capita
Ploughed fields and gardens	0.23
Total arable land	0.36
Total agricultural land	0.59

Table 12. Elevation above Mean sea Level

Altitude above mean sea level (m)	(%)
0-200	**14.2**
200-500	29.0
500-1000	32.4
1000-1500	20.8
1500-2000	**3.8**
>2000	**0.1**
Total	**100.0**

An important consideration is the size of individual land holdings. In Bosnia and Herzegovina these are very small with 54% of the properties occupying an area of less than 2 ha (see Table 13).

Table 13. Size of Land Holdings in BIH

(ha)	(%)
< 1	34.5
1-2	19.5
2-3	13.5
3-5	16.0
5-8	10.5
8-10	3.1
> 10	2.9
Total	100.0

Land use in Bosnia and Herzegovina suffers from inadequate and irrational planning of resources. Loss of agricultural land in most cases results from unplanned building of residential and industrial facilities and infrastructure, irrational exploitation of mineral raw materials and excessive erosion caused by deforestation and irregular treatment of slopes. In FBIH this loss amounts to more than 3,000 ha per annum and in RS to more than 2,000 ha.

5.1. Problem identification and analysis:

The main problems related to the land degradation/destruction of soil and loss of productive agricultural lands are as follow:

Destruction of soil caused by exploitation of raw materials. Surface exploitation of mineral ores (coal, iron ore, bauxite, clay) has resulted in 15,000 ha of affected land. The main consequence of this kind of exploitation is not only the direct land loss due to the mining, but also the additional land loss due to disposal of waste material adjacent to the mining area.

Landfills. Waste is dumped on large areas of fertile agricultural land, thus precluding the possibility of agricultural production on that land. Industrial wastes are of particular concern and these include:

- Sand and ash from Thermal Power Plants (dumpsites and coal-ash disposals in Lukavac, Tuzla, Kakanj, Ugljevik and Gacko), taking up over 500 ha;
- Red mud from aluminum processing (Mostar, Zvornik) and other
- Dumpsites around mines.

Construction of residential, industrial and other facilities. Due to irresponsible decision-making, most infrastructure (settlements, roads, airports, water reservoirs) has been built on fertile agricultural land, resulting in permanent consequences upon the environment in BIH.

Increase in soil acidity in the past few decades is also notable. Acidification (both natural and due to emission) also degrades other soil characteristics, thus having adverse effect upon the plant cover (reduced production of agricultural crops and destruction of forest cover). This is widespread in places close to thermal power plants (Tuzla, Kakanj, Ugljevik, Gacko) and in industrially developed centers (especially those associated with chemical industry) where there are large scale emissions of SO_2, CO_2, NO_X and other gases that cause acid rains and soil acidification. As a result cautions are leached out of the soil leading to decrease in soil fertility.

Erosion, landslides and deforestation. The hilly terrain and relatively high precipitation in Bosnia and Herzegovina means that much of the country is exposed to water-induced erosion. This is most pronounced in the central and southern areas of the country where annual precipitation reaches up to 2,000 mm. More than 84% of the country has land slopes in excess of 13%, water induced erosion is an increasingly present problem today particularly when land cover is removed through uncontrolled exploitation of timber.

The war activities caused the soil degradation through movement of combat forces and war machinery, especially when these activities were taking place on moist land. This resulted in compaction of soil, damages to its composition, decrease in water permeability and creation trapped water pools in plow land and grassland as well as intensification of the erosion processes and jeopardizing the ground water resources. Huge destruction of soil was caused by construction of trenches, dykes, fortifications, provisional roads, settlements, graveyards and deforestation. It is estimated that during the war about 6000 ha were damaged this way.

Contamination of land with mines. During the war in Bosnia and Herzegovina 6,000 ha of land were directly destroyed by war actions and between 15,000 to 20,000 minefields were created using over 4 million mines and other explosive devices. These were scattered over an area of 420,000 ha, or 8% of the total land area. The presence of these mines not only poses direct threat to the population, but also prevents the use of land and exploitation of timber until they have been cleared.

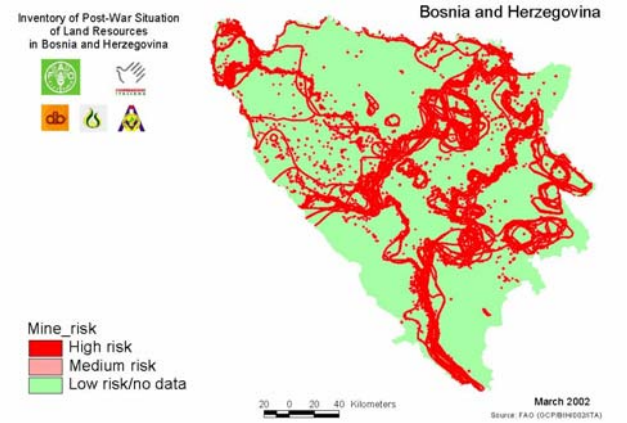


Figure 4. Map of Landmines in BIH

5.2. Other problems which endanger sustainable land use in BIH are:

- Lack of systematic soil monitoring;
- Lack of a soil/land informational system (SIS);
- Lack of information on soil/land contamination to ensure healthy food production;
- Lack of an adequate system of land assessment (land classification);
- Lack of a unified inventory for land (separate registry and deed);
- Lack of implementation of rehabilitation and remedial measures;

- Low level of awareness regarding the significance of soil and land for sustainable development and survival of mankind;
- Low level of land use planning;
- Lack of large-scale soil maps that would serve for better physical and land use planning.

5.3. SCHEDULED URGENT MEASURES TO SOLVE THE PROBLEMS:

- **NAP preparation and its integration into the National Development Strategy, PRSP, and all other relevand UNCCD related strategies and documents in BIH**
- **Assessment of potential and active soil erosion processes in BIH,**
- **Assessment of drought effect in different parts of BIH,**
- **Protection of hilly-mountainous areas (83.5% of the national territory) from water erosion by introduction of soil and water conservation measures with sustainable agricultural development,**
- **Sustainable use and management of land,**
- **Revitalization of the karstic (lime-stone) area that covers more than one third of national territory which is drastically eroded and desertified,**
- **Protection of high quality soils from non-agricultural use and introduction of legal regulations governing the water and soil management,**
- **De-mining of BIH territory represents an extremely important and urgent task for social, economic and security reasons for many people.**
- **Flood control and land drainage of flatland in the river valleys and karstic fields (that covers totally about 400,000 ha),**
- **Creation and strengthening of scientific-research institutions in order to enable them to apply the modern technologies, information systems, transfer of knowledge and education,**
- **Implementation of significant and experimental watersheds according to European experience for monitoring erosion processes, sedimentation and contamination in relation to land use, etc.**

6. Socio-economic features

Within former Yugoslavia, Bosnia and Herzegovina was listed as generally under developed, lagging some 15% behind the Yugoslav average GDP per capita and 46% behind the world average. Due to significant investments before the war in the energy and industrial sectors, this was changing, with the GDP being on a strong upward trend. Industry was becoming a dominant sector and its share of GDP was about 60%. War however changed all this. Significant changes in the structure of economy resulted with the industrial sector being the worst affected. Few of the designated industrial zones in the cities now show industrial activity and although this has had major negative consequences on the economy of the country, it has resulted in positive impact upon the environment. Since the war, with assistance from abroad, the level of economic activity has started to improve and now stands at approximately 1/3 of the pre-war figure. There are however considerable hurdles, such as the process of ownership transition, to be faced before the economy is fully revived capable of sustainable development.

Foreign trade dramatically declined after the war. Exports dropped from the pre-war level of 2 billion USD to about 500 million USD, whilst imports rose from 1.7 billion USD to the present level of about 2.8 billion USD. This has resulted in the large trade deficit experienced today.

Employment has also suffered greatly from the changes brought on by the war. Previously the economy and the public sector provided employment for about 1 million people; about 330 thousand were unemployed. After the war, the employment level dropped to about 650 thousand, while the number of unemployed rose to 420 thousand. The impact of this is even greater when it is considered that the total population declined by one third in the same period. Added to this, amongst those still employed a further 150 thousand are expected to be made redundant following the process of privatization. This is illustrated in Table 14.

Table 14. Structure of Workforce in Bosnia and Herzegovina

Population available for work in BIH	**2,468,745**	**(100%)**
Economically active population	**1,233,357**	**(50.0%)**
Employed - recorded	629,382	**(25.5%)**
Unemployed - recorded	414,024	**(16.8%)**
Persons not on the records	189,951	**(7.7%)**
Economically inactive population	**1,235,388**	**(50.0%)**
Pensioners	316,705	**(12.8%)**
Persons currently attending education	332,365	**(13.4%)**
Persons out of work	586,318	**(23.8%)**

There is a direct correlation in BIH between poverty and degradation of environment. With approximately 60 to 70% of the present BIH population barely at subsistence level, uncontrolled and excessive exploitation of natural resources is taking place, particularly in agricultural areas, exacerbated by large migrations of rural population towards the cities.
This is exacerbated by the low production of the state-owned enterprises that are currently working at only 10-15% of their capacities. The end to this does not seem to be in sight as Donor funds are steadily being reduced and domestic sources of funding, earmarked to overcome the enormous social problems, are only slowly and negligibly increasing.

Considering social vulnerability and security, the population can be divided into four basic, socially critical groups:

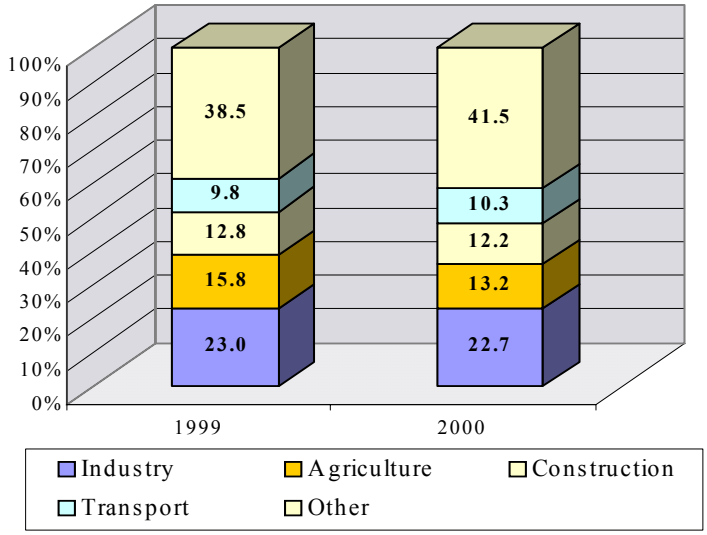
- Refugees and displaced persons;
- Young people fit for work but who are forced to emigrate due to the lack of domestic job opportunities;
- Persons at subsistence level but determined to stay in Bosnia and Herzegovina (population capable for work; single mothers without regular social benefits; disabled veterans; industrial invalids);
- Population who are socio-economically provided for (less than 20% of population including about 12% with family income in excess of 1,000 KM per month).

Demographic problems as a consequence of war. Recent population data are still being compiled, but it has been estimated that about 5% of the 1991 population were either killed or missing during the war (which lasted from 1992-1995). Of the remaining population, 2,678,000 inhabitants were displaced from their homes, 1,170,000 of them internally, and 1,250,000 are refugees. There are also 73,635 registered disabled veterans and 18,116 civil victims of war, among whom there is also a considerable number of children. Although rural migration to the cities has been traditionally pronounced in Bosnia and Herzegovina in a large number of municipalities, this has been accentuated by war and post-war events. According to the latest data available, the ratio between the urban and rural population is 60:40 respectively, which is almost the reverse of the 1991 situation when the urban population was 1.7 million (39.5% of total). This resettlement trend has led to the complete decline of many rural settlements and the

appearance of under populated areas. A false image of a highly urbanized country and of heavy pressure on environment is thus created.

When demographic indicators for 2000 are compared with 1996 data, unfavorable tendencies result: (I) the number of live births is decreasing by 15%, (II) the number of deaths is increasing by 17% (III) the natural growth of population has decreased from over 21,000 to about 9,000 persons. In addition, the brain drain of young and professionally qualified persons represents an increasingly serious problem. These are following overseas job opportunities, but declining to return once they have reached certain professional status abroad. This also affects the economic recovery of BIH and slows down the resolution of both social and economic problems.

The problems of poverty and social issues in Bosnia and Herzegovina have been recently comprehensively examined. It has been concluded that the solution lies precisely in economic development, which implies the revitalization of the country's economic capacities and a return to pre-war levels of employment and sustainable rural development. This in turn implies, among other issues, the return of refugees and displaced persons and the creation of an enabling environment for young well-qualified professionals and businesses. All of these could further increase the pressure upon the environment, which is already, in many cases, in a weakening state.



Source : UNECE common statistical database, 2003.

Figure 5. GDP by sector in 1999 and 2000 (per cent of total GDP)

Annex II: Administrative Structure of Bosnia and Herzegovina

Ministries of Bosnia and Herzegovina

Ministry of Foreign Affairs
Ministry of Foreign Trade and Economic Relations
Ministry of Communications and Transport
Ministry of Finance and Treasury

Ministry of Human Rights and Refugees
Ministry of Justice
Ministry of Security
Ministry of Defense
Ministry of Civil Affairs

Ministries of the Federation of Bosnia and Herzegovina[1]

Ministry of Defense
Ministry of Internal Affairs
Ministry of Justice
Ministry of Finance
Ministry of Energy, Mining and Industry
Ministry of Transport and Communications
Ministry of Labor and Social Policy
Ministry of Displayed Persons and Refugees
Ministry of Protection of War Veterans and Disabled Veterans Issues
Ministry of Health
Ministry of Science, Education, Culture and Sports
Ministry of Trade
Ministry of Physical Planning
Ministry of Tourism and Environment
Ministry of Agriculture, Water Management and Forestry
Ministry of Development and Entrepreneurship

Ministries of Republic of Srpska

Ministry of Economy, Energy and Development
Ministry of Finance
Ministry of Education and Culture
Ministry of Justice
Ministry of Defense
Ministry of Interior
Ministry of Administration and Local Government
Ministry of Health and Social Welfare
Ministry of Agriculture, Forestry and Water Management
Ministry of Transport and Communications
Ministry of Trade and Tourism
Ministry of Spatial Planning, Civil Engineering and Ecology
Ministry of Labor and Protection of the Veterans
Ministry of Economic Affairs and Coordination
Ministry of Refugees and Displaced Persons
Ministry of Science and Technology

Brcko District Departments

[1] Federation of BIH is divided into 10 cantons. Each canton has its own Government with almost all Ministries.

Department of Administrative Support
Department of Budget and Finance
Department of Public Works
Department of Utilities
    Logistics Unit is responsible for environmental protection
Department of Health, Public Safety and Municipal Services
Department of Education
Department of Agriculture and Forestry
Department of Public Records

Annex III: Brief Overview of Legislation in Bosnia and Herzegovina

1. State level

1. **Constitution of B&H**
2. **Law on Council of Ministers of B&H** (Official Gazette of B&H, No. 30/03)
3. **Law on Administration of B&H** (Official Gazette of B&H, No. 32/02)
4. **Law on the Ministries and other bodies of Administration of B&H** (Official Gazette of the B&H, No. 5/03, 42/03, 26/04)
5. **Law on Ministerial, Council of Ministers and other appointments** (Official Gazette of B&H, No. 7/03)
6. **Law on Civil Service in the Institutions of B&H** (Official Gazette of B&H, No. 12/02, 19/02, 35/03, 4/04, 17/04, 26/04, 37/04)
7. **Law on Administrative Procedure** (Official Gazette of B&H, No. 29/02, 12/04)
8. **Law on Administrative Dispute** (Official Gazette of B&H, No. 19/02)
9. **Law on Free Access to Information in B&H** (Official Gazette of B&H, No. 28/00)
10. **Law on Treasury of the Institutions in B&H** (Official Gazette of B&H, No. 27/00)
11. **Law on Concession** (Official Gazette of B&H, No. 32/02)
12. **Law on Statistics of B&H** (Official Gazette of B&H, No. 34/02)
13. **Law on Process of Signing and Implementation of International Legal Instruments** (Official Gazette of B&H, No. 29/00)

2. Entity levels

Federation of BIH

1. **Constitutions of FB&H** (Official Gazette of FB&H, No. 1/94, 13/97, 16/02, 22/02, 52/02, 60/02, 18/03, 63/03)
2. **Law on Government of F B&H** (Official Gazette of FB&H, No. 1/94, 8/95, 58/02)
3. **Law on Ministries and Other Administrative Bodies of FB&H** (Official Gazette of FB&H 19/03)
4. **Law on Administration** (Official Gazette of F B&H, No. 28/97, 26/02)
5. **Law on Ministerial, Governmental and other appointments in F B&H** (Official Gazette of F B&H, No. 34/03)
6. **Law on Civil Service in the F B&H** (Official Gazette of F B&H, No. 29/03, 39/04)
7. **Law on Administrative Procedure** (Official Gazette of F B&H, No. 2/98)

8. **Law on Administrative Dispute** (Official Gazette of F B&H, No. 2/98, 8/00)
9. **Law on Basic Local Self-Governance** (Official Gazette of F B&H, No. 6/95, 14/97)
10. **Law on Treasury in the F B&H** (Official Gazette of F B&H, No. 19/03)
11. **Law on Budget in the F B&H** (Official Gazette of F B&H, No. 20/98)
12. **Law on Free Access to Information in F B&H** (Official Gazette of FB&H 32/01)
13. **Environmental Framework Law** (Official Gazette of F B&H, No. 33/03)
14. **Law on Water Protection** (Official Gazette of F B&H, No. 33/03)
15. **Law on Waste Management** (Official Gazette of F B&H, No. 33/03)
16. **Law on Nature Protection** (Official Gazette of F B&H, No. 33/03)
17. **Law on Air Protection** (Official Gazette of F B&H, No. 33/03)
18. **Law on Fund for Environmental Protection** (Official Gazette of F B&H, No. 33/03)
19. **Water Law** (Official Gazette of F B&H, No. 18/98)
20. **Law on Concession** (Official Gazette of F B&H, No. 40/02)
21. **Law on Agricultural Land** (Official Gazette of F B&H, No. 2/98)
22. **Law on Physical Planning** (Official Gazette of F B&H, No. 52/02)
23. **Law on Construction** (Official Gazette of F B&H, No. 55/02)
24. **Law on Forests** (Official Gazette of F B&H, No. 20/02; 29/03, 37/04)
25. **Law on Public Utility Services** (Official Gazette of SR B&H, No. 20/90)
26. **Law on Collecting, Producing and Trafficking Raw and Waste Materials** (Official Gazette of F B&H, No. 35/98)
27. **Law on Statistics of the F B&H** (Official Gazette of F B&H, No.63/03)
28. **Law on Privatization of Enterprises** (Official Gazette of F B&H, No. 27/97, 8/99, 32/00, 45/00, 54/00, 61/01, 27/02, 33/02, 44/04)
29. **Law on Health Protection** (Official Gazette of F B&H, No. 29/97)
30. **Law on mining** ("Official Gazette of R B&H", No 24/93)
31. **Law on Ionized Radiation Protection** (Official Gazette of F B&H, No. 15/99)

Republic of Srpska

1. **Constitution of Republic Srpska** (Official Gazette of RS, No. 6/92, 8/92, 15/92, 19/92, 21/92, 28/94, 8/96, 13/96, 15/96, 16/96 and 21/96)
2. **Law on Government of RS** (Official Gazette of RS, No.3/97, 3/98, 29/00)
3. **Law on Civil Service in the RS** (Official Gazette of RS, No. 16/02, 62/02, 38/03)
4. **Law on Ministries** (Official Gazette of RS, No.70/02, 33/04)
5. **Law on Ministerial, Governmental and other appointments in RS** (Official Gazette of RS, No. 7/03)
6. **Law on Basic Local Self-Governance** (Official Gazette of RS, No. 35/99, 20/01, 51/01)
7. **Law on Law on General Administrative Procedure** (Official Gazette of RS, No. 13/02)
8. **Law on Administrative Dispute** (Official Gazette of RS, No. 12/94)
9. **Law on Treasury** (Official Gazette of RS, No. 14/00)
10. **Law on Budget System in RS** (Official Gazette of RS, No, 96/03)
11. **Law on Concession** (Official Gazette of RS, No. 25/02)
12. **Law on Free Access to Information in RS** (Official Gazette of RS, No. 20/01)
13. **Environmental Framework Law** (Official Gazette of RS, No.53/02)
14. **Law on Waste Management** (Official Gazette of RS, No. 53/02)
15. **Law on Nature Protection** (Official Gazette of RS, No. 50/02)
16. **Law on Air Protection** (Official Gazette of RS, No. 53/02)
17. **Law on Fund for Environmental Protection** (Official Gazette of RS, No. 51/02)
18. **Water Law** (Official Gazette of the RS, No. 50/06)

19. **Law on Agricultural Land** (Official Gazette of RS, No. 14/04)
20. **Law on Physical Planning** (Official Gazette of RS, No. 84/02)
21. **Law on Construction Land** (Official Gazette of RS, No. 86/03 or 41/03)
22. **Law on Forests** (Official Gazette of RS, No. 66/03)
23. **Law on Public Utility Services** (Official Gazette of RS, No. 11/95; 51/02)
24. **Law on Statistics of the RS** (Official Gazette of RS, No.85/03)
25. **Law on Privatization of state capital in enterprises (**Official Gazette of the RS, No. 24/98, 62/02, 65/03)
26. **The Law on Mining** ("Official Gazette of RS", No. 10/95, 18/95)
27. **Law on Geologic Research** (Official Gazette of RS, No. 51/04)
28. **Law on Ionized Radiation Protection and Radiation Security** (Official Gazette of RS, No. 52/01)
29. **Law on Health Protection** (Official Gazette of RS, No. 18/99, 58/01, 62/02)

3. Brcko District level

1. **Statute of District Brcko** (Official Gazette of B&H, No. 9/00, 23/00)
2. **Law on Executive Power** (Official Gazette of DB, No.2/00, 5/01, 9/01, 12/01, 16/01, 17/02, 8/03)
3. **Law on Budget in District Brcko** (Official Gazette of DB, No. 16/01)
4. **Law on Revenue Service** (Official Gazette of DB, No. 2/01, 2/03)
5. **Law on Administrative Procedure** (Official Gazette of DB, No. 3/00,9/02)
6. **Law on Administrative Dispute** (Official Gazette of DB, No. 4/00, 1/00)
7. **Law on Physical Planning** (Official Gazette of DB, No. 9/03, 15/04)
8. **Environmental Framework Law** (Official Gazette of DB, No. 24/04)
9. **Law on Nature Protection** (Official Gazette of DB, No. 24/04)
10. **Law on Water Protection** (Official Gazette of DB, No. 25/04)
11. **Law on Waste Management** (Official Gazette of DB, No. 25/04)
12. **Law on Air Protection** (Official Gazette of DB, No. 25/04)
13. **Law on Communal Activities** (Official Gazette of DB, No. 30/04)

4. Cantonal level in the Federation of Bosnia and Herzegovina Entity

List of applicable laws

1. Canton Una-Sana

1. Constitution of Canton (Official Gazette, No. 1/95, 2/97, 9/99, 5/00, 3/03, 11/03, complete text 1/04)
2. Law on Government (Official Gazette, No. 2/97)
3. Law on Administration (Official Gazette, No. 2/00)
4. Law on cantonal ministries and other cantonal administrative bodies (Official Gazette, No.6/02, 3/03, 7/04)
5. Law on local self-governance (Official Gazette, No. 5/97, 1/98, 2/00, 7/01)
6. Law on Forests (Official Gazette, No. 5/97)
7. Law on Agriculture Land (Official Gazette, No. 5/97)
8. Law on Physical Planning (Official Gazette, No. 9/02)
9. Law on Concession (Official Gazette, No. 10/03)

2. Canton Posavina

1. Constitution of Canton (Official Gazette, No. 1/96, 3/96, 7/99, 3/00, 5/00)
2. Law on Government (Official Gazette, No. 1/96, 4/96, 8/00)
3. Law on Administration (Official Gazette, No. 3/98)
4. Law on cantonal ministries and other cantonal administrative bodies (Official Gazette, No. 1/96, 3/96, 1/97, 8/00, 1/03, 2/03)
5. Law on local self-governance (Official Gazette, No. 7/00)
6. Law on Administrative Disputes (Official Gazette, No. 3/98)
7. Law on Physical Planning (Official Gazette, No. 5/99; 7/00)
8. Law on Environmental Protection (Official Gazette, No. 4/00)
9. Water law (Official Gazette, No. 2/00)
10. Law on Agriculture Land (Official Gazette, No. 2/00)
11. Law on Construction (Official Gazette, No. 5/99, 7/00)
12. Law on Concession (Official Gazette, No. 6/03)
13. Law on Communal Activities (Official Gazette, No. 1/98, 6/01)

3. Canton Tuzla

1. Constitution of Canton (Official Gazette, No. 7/97, 3/99, 13/99, 10/01, 14/02, 6/04)
2. Law on Government (Official Gazette, No. 17/00)
3. Law on Administration (Official Gazette, No. 1/99)
4. Law on cantonal ministries and other cantonal administrative bodies (Official Gazette, No. 17/00, 3/01, 12/03)
5. Law on local self-governance (Official Gazette, No. 6/98, 7/02)
6. Law on Environmental Protection (Official Gazette, No. 6/98; 15/00)
7. Law on Nature Protection (Official Gazette, No. 10/04)
8. Law on Noise Protection (Official Gazette, No. 10/04)
9. Water law (Official Gazette, No. 15/99; 9/03)
10. Law on Forests (Official Gazette, No. 10/99; 7/02)
11. Law on Agriculture Land (Official Gazette, No. 11/00, 4/04)
12. Law on Air Protection (Official Gazette, No. 6/00)
13. Law on Concession (Official Gazette, No. 9/01, 5/04)
14. *Law on Waste (Official Gazette, No. 17/00)*
15. *Law on Physical Planning (Official Gazette, No. 16/00; 10/02)*
16. *Law on Construction (Official Gazette, No. 10/02)*

4. Canton Zenica – Doboj

1. Constitution of Canton (Official Gazette, No. 7/96, 1/96, 13/99, 10/00)
2. Law on Administration (Official Gazette, No. 9/00)
3. Law on cantonal ministries and other cantonal administrative bodies (Official Gazette, No. 16/00, 7/01, 8/01, 13/02, 14/02)
4. Law on local self-governance (Official Gazette, No. 13/98, 8/00)
5. Law on Environmental Protection (Official Gazette, No. 1/00)
6. Water law (Official Gazette, No. 8/00)
7. Law on exploration and use of mineral raw materials (Official Gazette, No. 13/00)
8. Law on Spatial planning
9. Law on Concession (Official Gazette, No. 5/03)

5. Canton Bosansko – Podrinjski

1. Constitution of Canton (Official Gazette, No. 3/97, 8/98, 10/99, 10/00, 5/03)
2. Law on Government (Official Gazette, No. 5/03)
3. Law on Administration (Official Gazette, No. 5/03)
4. Law on cantonal ministries and other cantonal administrative bodies (Official Gazette, No. 5/03, 8/04)
5. Law on local self-governance (Official Gazette, No. 7/97)
6. Law on Physical Planning (Official Gazette, No. 8/04)
7. Law on Construction (Official Gazette, No. 8/04)
8. Law on Concession (Official Gazette, No. 5/03)

6. Canton Central Bosnia

1. Constitution of Canton (Official Gazette, No. 1/97, 5/97, 6/97, 2/98, 8/98, 10/00, 8/03, 2/04)
2. Law on Government (Official Gazette, No. 5/03, 14/03)
3. Law on Administration (Official Gazette, No. 5/98, 10/01, 15/01)
4. Law on cantonal ministries and other cantonal administrative bodies (Official Gazette, No. 8/03)
5. Law on local self-governance (Official Gazette, No. 1/98)
6. Water law (Official Gazette, No. 14/02)
7. Law on Air Quality (Official Gazette, No. 11/00)
8. Law on Noise Protection (Official Gazette, No. 11/00)
9. Law on Concession (Official Gazette, No. 12/00, 13/03)
10. Law on Forests (Official Gazette, No. 14/02)

7. Canton Herzegovina – Neretva

1. Constitution of Canton (Official Gazette, No. 2/98, 3/98, 4/00)
2. Law on Administration (Official Gazette, No. 11/99)
3. Law on cantonal ministries and other cantonal administrative bodies (Official Gazette, No. 1/98, 1/02)
4. Law on local self-governance (Official Gazette, No. 4/00)
5. Law on Environmental Protection (Official Gazette, No. 7/04)
6. Law on Construction (Official Gazette, No. 5/04)
7. Law on Concession (Official Gazette, No. 2/03)
8. Law on Communal Activities (Official Gazette, No. 4/04)

8. Canton West Herzegovina

1. Constitution of Canton (Official Gazette, No. 1/96, 14/00, 17/00, 1/03)
2. Law on Administration (Official Gazette, No. 10/99)
3. Law on cantonal ministries and other cantonal administrative bodies (Official Gazette, No. 9/04)
4. Law on local self-governance (Official Gazette, No. 9/00, 5/03)
5. Law on Environmental Protection (Official Gazette, No. 5/00)
6. Law on Physical Planning (Official Gazette, No. 4/99; 10/03)
7. Law on Mining (Official Gazette, No. 2/99)
8. Law on Construction (Official Gazette, No. 4/99; 15/01, 10/03)
9. Law on Concession (Official Gazette, No. 12/00, 13/03)
10. Law on Communal Activities (Official Gazette, No. 14/00)

9. Canton Sarajevo

1. Constitution of Canton (Official Gazette, No. 1/96, 16/97, 14/00, 4/00)
2. Law on Administration (Official Gazette, No. 20/01)
3. Law on cantonal ministries and other cantonal administrative bodies (Official Gazette, No. 4/00, 13/02, 16/03, 26/04)
4. Law on local self-governance (Official Gazette, No. 22/00)
5. Water law (Official Gazette, No. 16/00)
6. Law on Forests (Official Gazette, No. 4/99)
7. Law on Noise Protection (Official Gazette, No. 10/99)
8. Law on Air Quality (Official Gazette, No. 10/99)
9. Law on Physical Planning (Official Gazette, No. 10/04)
10. Law on Communal Cleaning (Official Gazette, No. 11/97)
11. Law on Concession (Official Gazette, No. 21/03)

10. Canton Herzegovina – Bosnia

1. Constitution of Canton (Official Gazette, No. 3/96, 9/00)
2. Law on Administration (Official Gazette, No. 4/98)
3. Law on Organization and Activities of the Cantonal Administrations (Official Gazette, No. 15/99, 8/03)
4. Law on local self-governance (Official Gazette, No. 4/98, 13/00)
5. Law on Agriculture Land (Official Gazette, No. 10/98)
6. Law on Physical Planning (Official Gazette, No. 14/98)
7. Law on Forests (Official Gazette, No. 4/98; 13/98; 15/99)
8. Law on Construction (Official Gazette, No. 14/98)
9. Law on Mining (Official Gazette, No. 12/01)
10. Law on Concession (Official Gazette, No. 14/03)
11. Law on Administrative Procedure (Official Gazette, No. 13/98).