



**THE REGIONAL ENVIRONMENTAL CENTER**

*for Central and Eastern Europe*

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**Annex 2**

**COUNTRY REPORT**

**BOSNIA & HERZEGOVINA**

**WITHIN**

**STRATEGIC ENVIRONMENTAL ANALYSIS  
OF  
ALBANIA, BOSNIA & HERZEGOVINA, KOSOVO  
AND MACEDONIA**

produced by  
REC country office in Bosnia & Herzegovina

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## Country report – Bosnia and Herzegovina

### **Methodology**

The REC Country Office in Sarajevo and its Field Office in Banja Luka have prepared the country report for Bosnia and Herzegovina. A number of interviews have been carried out as well as two roundtables organized with the participation of all key BiH experts in the environmental field. The REC expert team for this task was composed of 4 environmental specialists from different backgrounds, as follows:

Dr. Nasad Seremet - REC Country Office Director (Environmental Management)

Mrs. Sanda Midzic, B.Sc. Civil Engineering Faculty (Waste, Policy, Legislation)

Mr. Branko Vucijak, M.Sc. Applied Mathematics – Hydro-engineering Institute (Economic Instruments, GIS, database management, etc.)

Dr. Osman Slipicevic, Public Health Institute of F BiH (Environment & Health)

The team lead by the REC's Country Office Director, Dr. Nasad Seremet, had four discussion meetings, and employed the same methodology of section preparation and conclusions. Dr. Seremet and Mrs. Midzic participated in the startup Workshop in Szentendre, and Mr. Vucijak and Dr. Seremet attended the second one in Stockholm. Each of the experts was responsible for covering certain fields of the Assessment, including library research and personal contacts for data collection on environmental status, indicators and conclusions. Also, valuable input came from the REC Field Office in Republika Srpska, and from the participation of the BiH Environmental Steering Committee. Dr. Seremet performed the overall review of the material.

### **Physical Background**

The last decade in Bosnia and Herzegovina was dominated by political and economic changes. This was brought about by the transition of economic and political systems forced by the dissolution of former Yugoslavia, the international recognition of Bosnia and Herzegovina as an independent and sovereign state, and a four-year war and its consequences (destruction of public, urban and economic systems, destruction of the population, displaced population etc.).

The period between 1989 and 1992 was a period of political and economic change caused by transition of the economic and political system. In that time the process of a market economy was introduced in Bosnia and Herzegovina. The result was price liberalization, surplus manpower and closing of the companies that could not succeed according to this principle. It was the first step of transition from socialism to capitalism in Bosnia and Herzegovina.

Under these circumstances, the war that caused difficult consequences to all fields of life in Bosnia and Herzegovina started. The economy was totally destroyed, residences were mostly damaged or destroyed, and the population displaced. The Dayton Peace Agreement (DPA) ended the violent conflict in Bosnia-Herzegovina (BiH) in December 1995. An international peacekeeping force -- SFOR -- and a civilian body mandated to implement the DPA -- the Office of the High Representative (OHR) -- have since guaranteed a measure of stability and encouraged new economic life to return. The situation in BiH is reassuringly peaceful. SFOR troops will be reduced further from an initial 60,000 to 19,500 by mid-2000.

Today BiH has employment opportunities only in the non-production sector, but it is expected that industry will soon become the basis of economic development. Production of healthy food is also one of the strategic aims of social and economic development in the country.

Great progress has been made in reconstructing infrastructure, restoring basic services, and putting in place measures such as common vehicle registration and a single currency that ensure freedom of movement throughout BiH. The country can now begin to move away from a mainly rehabilitative programme, towards medium-to-long term development and national reconciliation.

The DPA-created internal political structure of BiH is extremely complex, particularly in the Federation of Bosnia-Herzegovina (FBiH) which is subdivided into 10 Cantons. Outmoded models of governance foster corruption and patronage, undermine the collection of public revenues, and limit employment-creating investment. Private and foreign investment is far below what could be expected in a more open and supportive environment. As a result, estimates of unemployment -- official plus "hidden" -- are as high as 49 percent in the Federation of Bosnia and Herzegovina (FBiH), and 60 percent in the Republika Srpska (RS).

The environmental policy within each entity also reflects the distinct ideologies and conservative views of those in power. Taxation, customs controls and sector programmes are governed by the entity rather than the State. Each FBiH canton also has its own government structure and distinct social and economic development policies and strategies. With a unitary government structure, policy questions in the Republika Srpska (RS) are more straightforward than in the FBiH, but policy differences between the two entities are still a major issue.

This complex situation has serious implications for efficient resource use and compatibility between programmes aimed at a population of some 3.5 million people. Separate funding mechanisms in areas such as health and environment threaten to derail attempts to reform services and put them on a sustainable footing.

Political tensions impede the return of refugees and internally displaced people to their prewar homes. Many displaced people may of course never return; fears created by the war run too deep, or they may have simply established new lives elsewhere. But a more constructive and open political environment would allay fears and open the way for reintegration, investment, and a more prosperous future.

## 1. Environmental Status

### 1.1 Land

The main problems jeopardizing not only the land (and which are direct consequences of war) are connected with landmines and other kinds of unexploded shells and bombs. It is estimated that there are between 3 and 6 million pieces of unexploded ordnance and more than 16,000 minefields on the territory of BiH. According to available data, there are 700 tons of explosive materials around the city of Sarajevo alone; and up to now, only 5% of that quantity has been removed.

According to Prof. T. Saric, erosion has endangered 89% of land, and 10% of land is badly damaged by it. In general, one can say that land management practice was always very poor in Bosnia and Herzegovina. Very unfavorable relief and poor agricultural practices and level of farmers' knowledge caused large losses of land every year. Some 20,000 ha of so called "technological deserts" exists with only 1.5% of destroyed land being recultivated. This is the result of mining and some industrial activities.

Since the war, the land situation has worsened. New refugee settlements, SFOR camps and land minefields have endangered agricultural land. It is estimated that 27% of ploughed land is mined as well.

Land quality is also threatened by the large number of improperly managed dump sites, growing spontaneously without any control. The rural areas are flooded by different kinds of waste, mostly household waste. This very poor waste management practice has endangered the land quality and that of underground water as well.

A major problem is abandoned unploughed land. Before the war roughly 27% of ploughed land was out of production. The percentage of uncultivated ploughed land in 1997 was 42.8%.

Before the war pesticides were a great risk, because of uncontrolled usage (even as high as 1 kilogram of pesticide per 1 hectare of cultivable soil). During the war, agricultural production was reduced to a figure of 0.25 ha per person. Soil was thus spared from pesticide contamination, but with reconstruction of industry and agriculture that risk will be renewed. At the same time, possibilities for control are reduced.

The estimations show the distressing facts that about 60% of livestock disappeared during the war, as well as 70% of tractors and other agricultural tools.

## **1.2 Water**

Before the war, most of the rivers were very polluted (47% of monitored parameters exceeded the limits of the lowest Class IV). The Bosna and Vrbas rivers were especially polluted. After war there was some improvement in surface water quality, due to temporary cessation of industrial operations; yet at the same time, the war has caused a considerable local worsening of the situation, particularly with regard to domestic wastes following destruction or disrepair of many municipal water facilities. However, the results of a survey done by the Hydro-Engineering Institute (on 2,200 km of major rivers) show that only some 3% of all rivers are totally free of pollution and almost 30% of rivers fall into the category of eutrophied or severely eutrophied.

One of the most critical environmental issues in BiH is water cycle management. In terms of pollution of surface and subsurface waters, BiH was the most polluted country from those established after the dissolution of former Yugoslavia. Pollution was particularly bad in several areas along the valley of the river Bosna where most industrial production was located, as well as in the Tuzla Canton (where chemical processes discharged waste directly into watercourses).

Continuing and regular laboratory testing of water is ensured for only 55% of the population in BiH. Only 32% of the urban population is supplied with safe, treated drinking water. 42% of laboratory tested water samples are unsafe. Microbiological analyses show that 32.5% of all water samples are unsafe. Estimates are that the percentage of the rural population which is supplied with safe drinking water is significantly less than 32%. The assessment of water quality and safety is made in accordance with the adopted Act on water quality and WHO recommendations.

Specific data on the quantity of lead, pesticides, nitrates and microorganisms in drinking water samples is limited or not available.

The data on acute intestinal infectious disease and morbidity emphasizes the importance of proper water supply and continuing monitoring and control of drinking water.

In 1990, in BiH, 25.4% of water samples were contaminated by microorganisms, while chemical contaminants were found in 33.3% of water samples. This data shows that even before the war, BiH was among countries with a high percentage of waterborne infectious morbidity. From 1986-1990, there were 37 outbreaks of waterborne intestinal infectious diseases with 2,310 sick persons, out of which there were 21 epidemics of hepatitis, 15 of diarrhea, and one of typhus.

The morbidity of infectious intestinal diseases rose during the war. In 1991, there were 1,875 cases of Hepatitis A and 3,411 of diarrhea, while in 1993 the number of cases reached 21 937 of diarrhea and 7,421 of Hepatitis A. Almost the whole territory of BiH was hit by the epidemics. Initially, these outbreaks could be attributed to waterborne infections, and due to water shortages and improper sanitary conditions they were transmitted to the larger population.

In 1998, there were 22 outbreaks of infectious and microbial diseases with 451 affected persons, out of which there were 3 epidemics of diarrhea with 183 cases, one epidemic of hepatitis A with 5

cases, 14 outbreaks of trichonosis with 186 cases, and four of alimentary toxification with 77 cases.

We can see the significance of adequate water quality and permanent hygiene monitoring and control in the numbers of waterborne illnesses, e.g. enterocolitis and Hepatitis A. Enterocolitis was in fourth position among the top ten infectious diseases, with a morbidity rate of 179/100,000.

Hepatitis “A” was eighth, with a morbidity rate of 20/100,000 and total of 625 affected.

### **1.3 Air**

BiH was assessed to have contributed 32% of former Yugoslavia's air pollution (Independent Bureau for Humanitarian Issues 1988). No other air quality data appears to exist. Besides industrial facilities, it can be inferred that exhaust gases from transport vehicles account for a significant proportion of the air pollution.

High concentration of air pollutants has especially affected urban areas and caused increased morbidity and mortality of respiratory diseases, both chronic and acute. Also, the evidence suggests that increased mortality from lung cancer may be related to the aromatic hydrocarbons, benzene, and other potential carcinogens. A major indoor air pollutant in BiH is “environmental tobacco smoke”. The data shows that 75-80% of the population over the age of 18 smokes.

### **1.4 Biodiversity**

As most of the Balkan countries BiH possess rich in natural assets and variety of pristine landscapes. High mountainous barrier situated against Adriatic sea has formed rather specific microclimate characterized by emphasized biodiversity. The central and southern landscape is dominated by the Dinaric Alps, which mark the convergence of three distinct ecological zones: Mediterranean, Balkan and Central European. The nation's highest point is Maglic in Hercegovina, which measures in at 2385 m., the Adriatic Sea shoreline a full 20km is the lowest elevation. Plains and plateaux in the north flank the Sava River. With its 228 km the Neretva river is the longest river in BiH, which is home of the variety of species incl. endemic ones.

Up to 1990, according to the Law on Protection of Nature (1970), and Law on Protection of Cultural, Historical and Natural Heritage, only 0.55% of the territory of Bosnia and Herzegovina was protected (253 areas - 28127 ha), as follows: 5 Strict Reservations, 3 Managing Reservations, 2 National Parks, 29 Special Reservations, 16 Natural sights, 195 various natural monuments, and 7 species of plants and 259 species of animals (257 bird species).

That minimal protected surface include representative samples of the Balkan endemic species Panciceva spruce (*Picea omorica*), the native forest Perucica, the pristine landscapes of the mountain Klekovaca, Treskavica and Vranica (glacier lakes), water-falls on the rivers Una and Trebizat, etc.

The most prominent biodiversity problems in BiH are:

- Loss of habitat and biodiversity owing to overgrazing in fragile ecosystems
- Underdeveloped or nonexistent system of protected areas in country
- Poor land management including illegal settling in protected areas with fragile ecosystems

Bosnia and Herzegovina has a number of documents listing the flora species found on its territory. But, unfortunately, there are no data on the effects of the war on wildlife. Effective monitoring is still not at place. One significant achievement has been the publication of the national botanical Red List, covering the species growing on the entire territory of BiH (both Entities). This was commissioned in 1990 and compiled under siege conditions during the war, using literature and herbarium sources. Red List was finally published in 1997 (Silic). It covers all vascular plant groups and comprises 678 species registered according to the old IUCN threat categories.

Additionally, there are certain individual actions on the protection of the habitats of threatened species, such as the actions on protection of Hutovo Blato wetland (delta of river Neretva), through the implementation of different internationally financed projects.

## 2. Driving Forces

### 2.1. Poverty

It has been estimated (UNDP, 1998) that 60% of the population of BiH is in a state of poverty. There are some 608,617 insurance payers currently employed in BiH, and there are some 414,366 pensioners in both Entities (one employee has to “support” 0.68 pensioners).

According to the Survey on Income and Expenditure, led by the Institute for Hydro-Engineering in March/April 2000 in five BiH cities, the situation is as follows:

Rate of Employment and Reported Wages - The survey indicated that among those over 18 years of age, only 39% were employed and 61% were unemployed. Among those unemployed, 25% were looking for work and the remainder was not. Among those employed, 77% were permanently employed, 14% were temporarily employed, and 7% were operating their own private business. Most of those employed (78%) reported working from 20 to 26 days in the previous month. Reported monthly salary was less than KM 200 for 20% of those employed, KM 200-400 for 45%, KM 400-600 for 19%, and KM 600-800 for 6%. Very few reported wages of more than KM 800 per month.

Estimates of Total Monthly Income - It is important to underline that total income of a household is less than KM 200 for approximately 1/4 of all households, and for next 1/4 it is less than KM 400. Only about 14% had total income in the household of more than KM 1000 the previous month.

Another survey, has been carried out by the US AID in order to find out whether BiH families have financial means to pay for their utilities, e.g. safe water, sanitation, electricity etc. Since the end of the war (1992/95), a large number of households are refusing to pay costs of public utilities, for different reasons. In that situation, Communal Service Enterprises, were on the edge of bankruptcy. US AID has concluded that their investments in water & sanitation field will cease, unless those utilities are not being paid by beneficiaries.

### 2.2. Economy

#### *Background*

There is an urgent need to create new jobs in both Entities. Those in authority too often focus upon restoring the large pre-war state-owned enterprises, supported by many smaller enterprises (farmers in the rural economy, smaller enterprises and services in the urban economy). This strategy is not viable for several reasons:

- most factories are either war-damaged, or in poor condition after many years without maintenance and investment
- large firms were linked to an extensive supplier network across what are now separate countries, and sources of supply are insufficient to run them at economically viable levels (especially food processing factories)
- firms operated in a distorted economic context (inappropriate macro-economic policies and foreign debt) that is no longer available, etc.

Major characteristics related to the environment and the present economic situation in BiH are:

- Very few incentives, e.g. user fees, taxes, polluter pays principle, for pollution control
- Indiscriminate organized logging -- the lure of timber as a cash crop

- Overall, the environmental concern most commonly cited is the potential for a tremendous increase in industrial pollution as the economy grows in the absence of adequate environmental protection.

Many independent surveys have highlighted the culture of lawlessness, the lack of respect for institutional authority, and the prevalence of mafia-style "gangsterism" which pervades BiH society since the slide into war in 1992, as summed up by Transparency International in 1998. The closely related issue of corruption is a cause of serious concern to international actors in BiH, as well as for all individuals and corporations who rely upon the rule of law to protect their rights and professional interests.

### ***2.2.1 Agriculture and livestock***

Agriculture in BiH is characterized by the small size of farms -- on average 3 hectares. Irrigation systems are not widespread, so many projects in this area could be expected in the future, i.e. larger water capture from the Sava river basin.

War had a great impact on agricultural capacity, i.e. the number of cattle has drastically been reduced to around half that of the pre-war state (Sarajevo Canton before the war had 29,000 head of cows, and now there are only 10% left. The number of sheep was 60,000, and now there are only 5,000). The quantity of agricultural machinery is also drastically reduced. Minefields prohibit work on the land in many places, and many villages have been completely deserted by their inhabitants.

Concerning health, BiH has long tradition of production healthy and high quality food. Before the war BiH was great exporter of meat, milk and milk products, fruits and vegetable. Still, production was low according to Western European standards. One of the many reasons for such state was bad irrigation system. Unlike for state companies, private manufacturers did not use high technology in this area (irrigation systems, special hybrid seeds, artificial nutrition, etc.). This is very important, because private persons own 95% of the cultivable land. Environmental and health damage can be seen through the large quantity of imported, low quality food. Using less valuable seeds, BiH farmers are "forced" to enlarge their cultivable land on the "expense" of forests, parks, in order to get the same amount of products. Intensive development of agriculture, which is expected in future period, will cause revival of many former agricultural plants, and opening of new ones.

Concerning the environmental impact, agricultural facilities are big consumers of water, but it is also contaminant of water, especially aquifer. While great care was given to protection from water, nobody took care about protection of water itself. Water damage was especially expressed during uncontrolled and extensive use of different chemicals (fertilizers, plant protection means, and herbicides), which through rainfall drained into rivers and aquifer.

### ***Irrigated land***

The arable land area appropriate for intensive agriculture production in the Federation is relatively small. Rainfall distribution is unfavorable particularly in the region with Mediterranean climate. The precipitation from May to August in many regions is only 25% to 30% of the total annual rainfall. Water shortage during the vegetation period is a key limiting factor for agriculture development, especially in the region of the Adriatic Sea catchment area. In spite of the tradition of about 100 years, the area presently irrigated is only 4,630 hectares. Many irrigation systems have been seriously damaged because of the lack of maintenance and equipment destruction during the war. Irrigation could contribute to substantial increase of agricultural output Bosnia and Herzegovina. It has been estimated, based on humidity deficit, terrain slopes, soil quality, altitude, availability of water etc., that the potential area to be irrigated in the Federation is about 74,000 hectares.

Most of the plains in the Federation are classified as hydrofill soils. Although used as arable land, they are not well suited to modern agricultural production without proper reclamation measures. High moisture is the main limiting factor. Water surplus on the arable land occurs as surface, subsurface and groundwater that fills surface soil layers. For efficient agriculture, it would be necessary to drain surface water and regulate (maintain) tolerable underground water levels.

Water of bad quality (which contains industrial material, acid rains and colored rains) exerts an influence on agriculture, which can be seen in reduced production, poor quality produce and even by destruction of some crops.

Even before the war, pesticide usage was great problem, being uncontrolled and excessive and even reaching levels as high as 1 kg of pesticide per hectare of cultivable area. During the war agricultural activities were drastically reduced to around 0.25 hectare per person. In this way cultivable land recovered from overuse of pesticides, but redevelopment of agriculture will bring this same risk again. Due to war damages such as destroyed equipment and lack of trained professionals, a number of measures for food quality control are not performed (control of pesticides, myco-toxins, and additives).

Even though it is well known that food may present health risks both by microbiological contamination and the presence of toxic substances or radioactive elements, overall food and nutrition control is mainly focused on the risks from microbiological contamination. Risks from chemical pollutants and irradiation are underestimated and neglected.

Regarding the control of chemicals, only monitoring of parameters is currently being performed, which requires simple technology and less qualified personnel. More complex technologies, and new laboratory methods require educated and trained staff for detection and identification of chemical and toxic parameters.

In addition, as the system of food distribution is dispersed due to the effects of the war, the risk of contamination of foodstuffs is very high. Only 37-40% of foodstuffs are made in the country, and only 3% of the food production sector is owned by the state. Only 5% of foodstuffs are covered by safety controls in line with the Law on safety of food and consumer goods.

Currently, none of the laboratories of the public health institutes monitor pesticides, mycotoxins or food additives in foodstuffs, although it is estimated that about 10% of soil is cultivated using pesticides. Identification of food additives (K-sorbate, Na-benzoate, nitrates, nitrites, etc.), as well as control of heavy metals in food and consumer goods is made by the Public Health Institute of FBiH in line with the appropriate Act. In FBiH, there is still no referral laboratory for food control. Only about 5% of imported food and consumer goods are subject to control and monitoring.

### ***2.2.2. Forestry***

#### ***Basic information about Forestry***

Forest covers 55.6% of the territory of BiH. Within the Federation of BiH the share of forestland in 1996 was 48.2%, and in RS it was 51.8%. This means that forestland covers more than half the land surface in BiH. Roughly 20% of forests are privately owned, and 5% more is expected to become privatized.

#### ***Management of forest***

Public enterprises in both entities have the responsibility to manage, produce, and sell timber. All forestland is divided into 88 Forestry Economic areas whose responsibility is to prepare 10-year plans for forestry maintenance. Government and local communities must approve these plans. The government also sets the minimum price for timber.

The present law is old and not suitable. The prewar creators did not predict the existence of Cantons. This is why control of cutting is very poor and the “black cutting” and “black export” of raw wood has become the normal way of doing business in this sector.

In addition, the number of small wood mills and informal cottage operations is blooming without real control and they are a big danger to the sustainable management of the forest. Public enterprises Sipad and Krivaja are two main processors of wood and producers of furniture. Indeed, Sipad accounts for 90% of the total sales of these goods in BiH. Private business is very small, and only the Haznadarevic furniture company is a sizeable private enterprise, which has an export market as well.

Among the key environmental impacts of these activities are:

- Legislation governing forests is absent, which opens space for the uncontrolled and unprofessional cutting of forest timber. This leads to the deforestation of some areas and possible endangerment by erosion. Also, in the last few years unusually heavy flooding in mountainous areas has occurred. A possible cause was the uncontrolled cutting of trees.
- 20% of forested land is mined, and much of it is damaged by shell and bullet fragments which decrease the quality of timber.
- “Black”, informal cutting and “black export” of wood is a serious problem that greatly damages natural resources. The sharp slopes of the mountains are endangered by these operations. A direct result is decreased opportunities for the development of eco-tourism, hunting, etc. The long-term impact is loss of land and loss of biodiversity.
- The road network is very poor and the equipment for cutting and processing of wood is unsuitable and very old. Hence, the entire sector has very low productivity and a high level of waste (40%). Consequently, this industry is not competitive enough on the world market.

### **2.2.3. Energy**

There are three main energy resources in BiH: coal with 65%, water resources 33.4% (in calculation of water resources we used a period of 100 years’ duration), and wood. In the future, BiH will use mostly water power, rather than ecologically damaging coal.

Before the war, BiH met its needs for electricity, gas, and solid fuel and provided an adequate quantity of energy for the everyday life of its population. During the war, energy supplies were dramatically suspended. For example, gas needs for Sarajevo were 105,000 m<sup>3</sup> ( 6-8 Bar pressure) before the war, but once hostilities broke out Sarajevo got only about 20,000 m<sup>3</sup> of gas (1 Bar pressure). Electricity supply was at minimum, and transportation of wood and coal was hindered by road blockades, lack of fuel, etc. The situation was dramatically aggravated during the winter, which resulted in illegal and unplanned wood cutting and devastation of forests. About 40,000 trees were cut in Sarajevo alone.

The annual production of all hydropower plants in Bosnia and Herzegovina totals about 9,000 GWh with a power capacity of 2,370 MW. About 56% of the total power capacity and 48% out of the total energy production is utilized in the Federation. Energy is one of the few natural resources with a surplus in the Federation, constituting high economic value.

The hydropower potential is 1,530 MW and 5,150 GWh throughout the whole country. However, the development of hydropower has strong impacts on other water uses and on the aquatic environment. Some of the proposed hydropower schemes do not comply with future environmental requirements. Lack of financial resources might postpone schemes, but there are signs that foreign investors are interested in hydropower development in the country that poses overall risks to the environment.

Electric power supply is a main base for industrial development. Hydropower plants, especially when able to provide peak energy production, have an irreplaceable role in the energy power

system. Those particularly with a large volume of water storage, may also have an important role in the water management system, contributing water supply to communities and industries, water for irrigation, regulation of flow peaks, increase of minimal flows in rivers, recreation, etc. However, this too can have a negative impact upon water, flora and fauna.

#### **2.2.4. Transport**

The transport sector exerts a serious influence on all components of the environment and health. Transport is one of the essential circumstances of modern life and it is increasing every day. Road transport safety in BiH is far from acceptable due to the large number of old vehicles whose technical characteristics do not meet required standards, the lack of new communication infrastructure and poor maintenance of the existing one, and the increasing number of drivers whose poor skills endanger the lives of pedestrians and other drivers. Increasing amount of cars is a threat for local air quality as well as to the damage to the remaining green areas (84.837 vehicles are registered in the Canton of Sarajevo, while there are only 1.863 parking places available).

Due to political reasons, railway transport is still not fully functional.

Also, in BiH it is necessary to improve public transportation and reduce overloading and emissions through free public transport in the cities. A good example is Sarajevo, with free public transport for retired persons.

#### **2.2.5 Industry**

Air pollution is not on the agenda in BiH and therefore successful monitoring of air pollution does not exist. There are some measurements that can give total air pollution load. Furthermore, no effective legislation for the regulation of emissions to the atmosphere and air quality, nor any effective framework for environmental licensing exists.

In the city of Zenica, before the war, production of steel amounted to 1,800,000 tons and production of coal amounted to 1 million tons. The steel factory in Zenica also produced 73,000 tons of SO<sub>2</sub>, and 20,000 tons of dust. There were 90 organic substances found in the atmosphere of the city of Zenica. Although cessation of production caused by the war gave positive results related to air quality, in this reconstruction period there are some serious proposals to restart production in the steel factory.

According to air pollution surveys done regularly by the Canton's Public Health Institute, the city of Sarajevo was among the most polluted cities in Europe in the 1980s. Also, the army factory in Konjic, wood factory in Maglaj and Doboj, coal mine, coal power plant and cement factory in Kakanj, factory for production of acetylene, chlorine and chloric acid in Jajce, fertilizer factory, detergent factory and chemical factory in Tuzla, and about ten smaller towns in BiH with chemical factories were also among the biggest polluters.

In the river Bosna catchment area, (with its tributaries) untreated water is used much more for industrial purposes than in other areas. Prewar estimates were between 90 and 95 million m<sup>3</sup> per year. For Tuzla-Podrinje, the most important water resource was lake Modrac, (an artificial lake on Spreca; the tributary of the Bosna river) that provided 72.3 million m<sup>3</sup> of industrial water for the following industries in Tuzla and Lukavac: Tuzla power supply company, Lukavac soda factory, Lukava chemical factory, and the Tuzla salt mine.

Industrial activities are mainly located within larger urban areas. A wide range of processes contribute to different types of pollution. The pollution loads to watercourses have been determined for many years, since 1975. The Table in Annex VI shows pre-war point-source and non-point-source pollution loads. Due to the collapse of mainly government-owned industries with backward technologies, pollution has significantly decreased, to about four million p.e. per annum. There

were 122 industrial wastewater treatment plants (40% operating properly) before the war, but now virtually none of them is operational as a result of collapsed production and lack of enforcement.

There is no inventory of hazardous waste. There are very few cleaner production (CP) initiatives. Generally, BiH industry is very weak and environmental regulation supporting CP does not exist. Some activities on pollution reduction were performed before the war, but were mostly based on end-of-pipe treatments.

## 2.2.6 Consumption

### *Municipal waste*

Solid waste collection coverage was relatively high but disposal proved a continuous problem in most municipalities. Reliability and quality of the services was unsatisfactory. Environmentally dangerous solid waste disposal and illegal disposal are widespread throughout the country.

Also, it is important to underline that:

- Thousands of tons of waste and garbage have not been handled for years even in some urban areas (only recently the has the EC addressed this issue through the PHARE Program).
- BiH has accumulated tons of humanitarian aid in pharmaceuticals past their expiration dates. These are quite simply waste materials, for which there are still no adequate disposal facilities.
- Solid waste disposal (municipal, medical, toxic, and hazardous waste) sites are limited and all wastes are combined.
- Again, except in the Sarajevo Canton, there is no inventory of hazardous waste

*Total municipal waste generation per year*

<b>Number of Population</b>		<b>Waste generation Million kg.</b>
<b>Total</b>	3.798.500	1,5
Urban	3.038.700	1,2
Rural	759.800	0,2

*Source: Public Health Institute of Federation BiH*

From a sanitary and epidemiological point of view, solid wastes can affect human health as a source of a range of different communicable diseases. For instance, contaminated water and food may cause gastrointestinal infectious diseases such as typhus, diarrhea, hepatitis, cholera, and some viral infections. Some chemical agents in the waste may provoke toxification. Household waste may contain the microbes of tuberculosis, diphtheria, staphylococcus, streptococcus, etc. Animals may also be infected by some pathogens which could be dangerous for humans. In Bosnia and Herzegovina the practices of recycling and reuse of waste are very poor. Only paper and metal are recycled, and this only rarely.

In 1995, we were faced with outbreaks of hemorrhagic fever with 422 sick persons and 7 dead persons in several sites. This was the result of war actions in which people were forced to stay for days at frontlines in areas in which hemorrhagic fever was present. This outbreak probably would not have occurred if land sanitation and proper waste disposal were better carried out.

The same problem persists even now, although to a smaller extent, with 14 reported cases in 1996, and a morbidity rate of 0.69/100,000. In 1997, in Mostar, two cases of Kala Azar were reported and they also may be related to inadequate waste management.

Uncontrolled waste dumps and non-sanitary landfills very often catch fire, releasing heavily polluted smoke and a foul smell. These dumps are generally not fenced in, so animals (like dogs, cats, cows and sheep) can easily go through the garbage and pick up diseases. The sludge from

waste is leaking into nearby water sources, causing further contamination of water and related damage.

### *Municipal water consumption*

Water production in 1998 was estimated to be on average 420 l/day per capita, i.e. 134 l/day (32%) for households, 147 l/day (35%) for industry. Water losses were estimated to be 139 l/day per capita (33%). In most of the regions of BiH billing for water services was again established 1-2 years after the war, but very often, because of broken water meters, water charges are on a lump-sum basis.

The main reasons for this situation are usually explained as:

- low standard and lack of ability of citizens to pay
- water meters were destroyed or not calibrated and maintained during the war

Furthermore, urban services were characterized by significant operational inefficiencies, such as excessive energy consumption and water wastage. Poor commercial practices, inadequate maintenance and low tariffs resulted in both high and unaccounted for levels of consumption. Water services were also characterized by low staff productivity.

Today, the following facilities provide water supply to the population: water supply systems (around 55% of population) and alternative sources (public taps, water springs, dug wells, pipe wells and rainwater tanks). In recent years, the percentage of population supplied by water systems rapidly increased, especially in the cities. On the basis of this and other data it was planned to supply all of the urban population (100%) and 60% of the rural population in BiH with water from water supply systems. But the war put the country into the following situation:

- 45% of the water supply network is destroyed
- 20% of the water supply network is partially damaged
- 5% of the water supply network is worn out
- 20% of the water supply network is not damaged
- 30% of rural population is supplied with water from water supply systems
- 10% of the total water supply system is under reconstruction or already reconstructed
- There are 30%-70% of water losses in the system

According to abovementioned data we can estimate that population is being supplied with only 35% of their water needs. 55% percent of supplied water is continuously chemically and biologically controlled. This is directly related to the increase in number of patients suffering from water-born diseases caused by the poor hygienic conditions.

### **2.2.7 Natural resources**

BiH has many raw natural resources, including coal, iron, and bauxite. Exploitation of so many raw materials will cause multiplication of negative effects on soil quality. The exploitation process consists of removing of large soil layers in order to access raw materials. Removed layers are being displaced to another land surface, which destroys vegetation on those parts. Afterwards, extracted raw materials are being used in different technology processes, and in this way create many kinds of industrial and mine wastes.

The depth of excavated soil can be up to 300 m. the biggest excavations of that type are in region of Banovici and Zenica. Some data are given in the Table (Annex VII).

Excavated soil is being displaced, which causes additional damage to the land. Land damaged in this way is half of the surface directly damaged by excavations, i.e. 6,420 hectares.

## ***Fisheries***

The river Sava with its tributaries Una, Vrbas, Ukrina, Bosna, Tinja and Drina are significant sources of fish, as well as the river Neretva that empties into Adriatic Sea. These represent all necessary natural and technical conditions for large development of the fishing industry in BiH. Construction of hydropower plants on the rivers Neretva, Drina, Vrbas, Rama and Sana created many artificial lakes where fishery can be developed. Besides this there are favorable conditions for fishery development in the rivers as well as in the natural lakes by creating fish farms.

### ***2.2.8 Structural adjustment, privatization***

The privatization process in BiH started in 1999, first with the privatization of small and medium businesses. OHR has formed an international expert team, the Commission for Privatization, but “the model they have chosen is unique in the world”, and according to the Co-Chairmen of BiH Council of Ministers (“Oslobodjenje”, May 23<sup>rd</sup>), Mr. H. Siljadzic, “is completely wrong”. The main problems are lack of transparency, and absence of privatization on the state level -- one can therefore see that BiH has “an ethnic model of privatization” ongoing. Still, there is much to be done in organizing privatization process in a more satisfactory way, and it is expected that state and entities’ Parliaments will discuss this issue very soon. On the other hand, economic reforms and complete privatization is a prerequisite of the international community for any further investments in BiH. While it is difficult to identify any positive impacts of privatization on the implementation of cleaner production technologies or end of pipe solutions, the more immediate problem is who will pay for the past polluters’ environmental damage.

## ***2.3. Population***

According to the estimates of State Institute for Statistic and Health Protection of BiH, on the BiH territory there are at present 3,798,399 inhabitants. Compared to 1991 it is a 9.8% reduction. Percentage of the age group between 0-14 years is reduced as consequence of birth rate reduction, and forced migration of women of fertile age and preschool-aged children.

The percentage of the age group of 15-64 years is also reduced because of increased numbers of violent deaths within this group. At the same time we have almost doubled the percentage of the age group of 65 and over. This is not the result of increased longevity, but the reduction among the percentage of younger age groups. For all these reasons, the trend of population growth at the end of 1999 was regressive, with a narrower base of the demographic pyramid.

After signing of the Dayton Peace Accord, repatriation processes started, so that now we can expect more favorable movements of demographic characteristics of populations within BiH territory.

The ratio of city to rural population has also changed as result of the war activities. That ratio is, according to estimate of Institute for Statistic and Institute for Health Protection of BiH, 80:20 in favor of city population. This ratio is multicausal and forced war migrations have a determining role. Also, consequences are numerous and full of psychosocial, cultural, health and other phenomena, and have influence on the subject of this report, i.e. water in the widest sense of this word.

### ***Water Discharge - Municipal Waste Water***

Estimates show that 57% of the city population is connected to sewerage systems, while the rural population uses permeable septic tanks. Where a city sewerage network already exists, it is mostly worn out. Consequences are the breaking and cracking of sewerage pipes, followed by leakage of wastewaters and potential danger of infectious disease.

Because of bad life conditions parasitological diseases, especially scabies, have increased. In 1998 the morbidity rate for scabies was 299/100,000. Just before the war in BiH, the infant mortality rate was 14.5 per 1,000 newborns. There are no data according to different socioeconomic groups. The infant mortality rate for BiH in 1999 was 12.9 per 1,000 newborns.

In all bigger settlements and cities there are sewerage networks through which household wastewaters are being discharged directly into the rivers, in 90% of cases without prior collection for purification. Even the small number of existing collectors with purification systems was destroyed because of the war activities (e.g. the collector for the city of Sarajevo in Butila). Most municipalities in the FBiH have sewer systems but they only discharge the collected sewage directly into a surface water channel or a river. Almost all municipal sewer systems are gravity systems with no pumping stations. This greatly facilitates maintenance but many of the municipalities lack the necessary sewer cleaning equipment and vacuum trucks for emptying of septic tanks. Most sewer systems are combined systems (conveying both wastewater and storm water drainage), and the most common pipe materials used are asbestos cement and concrete. In 1996, ten municipalities were identified as having no sewer system.

Overflow of sewage during flooding is a problem in about 65% of municipalities. About 80 km of sewers are badly damaged and need replacement, and about 850 km of sewers require desalting and cleaning. The service level in wastewater services in the Federation is also far from the European level: connection rates are 35% ,against the European average of 75%. The most dramatic difference is in wastewater treatment: only six municipalities in the FBiH have a treatment plant (none operational at the moment). Pollution from municipal wastewater is significant.

The problems in wastewater services are similar to those in water supply and, consequently, also basically due to improper management and institutional arrangements.

Sewage discharges have been reported to have effects on human health and on the river ecology. For example, in Konjic regular epidemics of hepatitis during summer months, and in Bugojno on the average five incidences per year of fish kills in the river downstream from the town, have been reported. The latter pollution originates most probably from industrial waste discharge. Obviously there is a potential public health risk in many municipalities due to poor conditions of water supply and sewer systems.

Pollution of groundwater takes place through two routes: polluted surface water filters into the ground especially in karst areas; and uncontrolled dumping of solid waste, which mixes with rainwater. This causes problems to the water supply in karst areas, especially in Herzegovina.

## **2.4. Institutions, enforcement**

Cooperation between two entities, Federation BiH (FBiH) and Republic of Srpska (RS), on common environmental protection has improved relative to the situation existing two years ago. But still the main legal problems are in formulating a satisfactory integrated environmental legislation:

- inadequate cooperation on the national level (between entities),
- inadequate legislation at the national, canton and local level,
- inadequate institutional framework and capacity necessary for the implementation of legislation,
- inadequate pollution compliance and monitoring,
- ineffective coordination between various sectors and local and national levels,
- poor social and economic conditions for adequate development of environmental policy, as well as the poorly developed economic instruments are still characteristic for BiH.

Pollution has been exacerbated by the close relationship between polluter and regulator, as laws have been poorly enforced against government-owned enterprises, the major sources of pollution.

Because of the direct relationship between government and companies, it has been difficult for authorities to publicly admit to environmental problems, let alone correct them.

A general problem concerning the institutions in BiH is “disrespect for institutional authority”. The fact is that many independent surveys have highlighted the culture of lawlessness, the lack of respect for institutional authority, and the prevalence of mafia-style "gangsterism" which pervades BiH society since the slide into war in 1992, summed up by Transparency International in 1998. The closely related issue of corruption is a cause of serious concern to international actors in BiH, as well as for all individuals and corporations who rely upon rule of law in their protecting their rights and professional interests.

Economic instruments have no significant role in the demand and supply of environmental finance in our country except for a special water fee, because use of economic instruments puts most of the emphasis on the revenue raising potential of the central budget for other purposes rather than environmental ones.

There are no specific indicators for collection efficiency, monitoring and transparency of applying of existing economic instruments. Environmental reporting on protection expenditures is insufficiently reliable. These problems are associated with the modernization of economic data. Better co-ordination in the estimation of expenditure data seems feasible and would increase reliability.

Regarding different actors involved in development processes in BiH, driving not only the environment but also other sectors the following are active:

- NGOs: 61% national, 29% international, 3% UN, 3% government, and 1% other which are registered. Majorities of these organisations are in the Federation (54%) and in Republika Srpska (46%). Most of these organisations have activities in education/training (242), children/youth (205), human rights (194), returnees (180), civic society (178), humanitarian (169), women (156), psycho/social (154), information and media (133), health (129), micro-credit/income generation (122), shelter/reconstruction (122), agriculture (89), elderly (89), other (63) and demining/mine awareness (31).
- Social development teaching departments in universities, social departments in government and government agencies (in the Federation on the Federal level and canton level; in RS on a ministerial level, centres for social care on a municipal level, etc.)
- Statistical agency of BiH and the other entities; department for employment on a regional level.

A limited number of these can be considered driving forces for environmental improvement, for instance within the civil society sector, before the war, environmental NGOs worked in all the large urban centres and were organized on several different levels, from local and municipal groups to regional and national associations. From the number of several hundreds on environmental NGOs in early 1990s, in 1996 there were only 17 registered, with no possibility to be active on the whole territory of BiH. Before the war, NGOs were regularly supported by the Government and their actions and programs were also funded by local governments, municipalities, businesses and social organizations. However, during the period of 1992 until 1995, the majority of NGOs stopped operating, although some have survived or were even formed during these times. Unfortunately, organizational and financial struggles have allowed these NGOs to realize only a few of the goals listed in their programs.

REC surveys in 1996 and 1999 revealed that more than half of BiH's environmental NGOs were located in Sarajevo and Banja Luka. Most NGOs define themselves as grassroots organizations or as association of environmental professionals. They operate on local and regional levels. Protest actions, education and training are the most common activities. Most of them have no paid staff or adequate offices and equipment.

The REC Country Office BiH has been providing institutional and financial support to environmental NGOs for the past three years. Recently, some other international donors joined the support for the the third sector in BiH. A joint effort of international donor community in supporting environmental NGO activities in BiH would be of an enormous credit to building a civil society, and securing environmentally sustainable and transparent development of BiH society.

## **2.5. Gender**

The question of links between gender and the environment in Bosnia and Herzegovina, in the context of inequality has yet to be addressed. At the moment, there is no data confirming these links.

Obstacles that are present and which should be taken into account are several: sex stereotypes, conflict situation, political and social instability, traditional gender roles, lack of resources, insufficiency of sex desegregated data, reproductive and productive roles.

The female population constitutes the majority in BiH (approx. 52%) and women head 16-20% of all households in the country. The sources for household income still derive mainly from salaries, pensions, humanitarian aid, temporary jobs and agriculture.

The opposition against the advancement of women in power and decision making processes is based mainly on the conception that women should not be involved in politics, proclaiming that: women are too emotional and therefore not capable of evaluating political matters; women are already represented through their husbands, friends, and other male leaders and interfering in such a “dirty” matter as politics leads to a loss of femininity, or that women taking responsibilities or being involved in political issues abandon their families.

Low female participation in decision-making bodies is also related to lack of will and interest in having women present in the organizational structure of most political parties. The media itself has to change its attitudes and start to present the role of women differently in BiH, as the way they currently do this is quite stereotypical, and does not emphasize the role of women in decision-making bodies in a satisfactory manner.

## **2.6 Risks**

The war in BiH brought many social, economic and health changes, as well as environmental ones. War activities, but also humanitarian actions, caused countless new risks, which directly or indirectly jeopardized the environment. The presence of minefields, inadequate waste material disposal from foreign military units, 500 hundred tons of obsolete medical drugs, destruction of forests and vegetation are only some of the problems caused by the war. These are mostly described in the risks section. Some reference is made to human intervention.

As a result of the recently ended war, besides other problems, BiH also has experienced a deliberate ecological apocalypse, e.g. the presence of the abovementioned 16,000 minefields that cover 18% of the entire BiH territory. Also, poisonous gases and unidentified ecological toxins that were discharged about 2,500 times at 200 different locations throughout the country during the war, deserve mention.

There are more than 36,000 SFOR soldiers that discharge different kinds of waste materials without any control from BiH or entities' authorities.

As mentioned above, there is also problem of adequate storage or destruction of 500 tons of medical drugs, whose date of usage is expired. Every canton/region in BiH has already faced this problem. It is estimated that there are more than 740 tons of this waste on BiH territory. Medicaments were imported without any kind of control, and it was left to local authorities to

decide on further treatment. There are no facilities in BiH where these drugs could be safely incinerated, so another solution is found. Medicaments are placed in barrels, sealed with concrete and buried deep into the ground. This procedure has certain omissions. Metal barrels are being used instead of plastic barrels, mortar is being used (which can be easily washed out) instead of real concrete, and placing in ground is actually very shallow and anybody can reach the barrels easily.

Closure of industrial facilities caused by the war improved some elements of the environment in urban areas, like the quality of water, soil, air, etc. On the other hand, hewing down of about 40,000 grown trees in Sarajevo alone out of pure survival, and numerous poison gases thrown on the citizens of BiH present new and extremely dangerous hazards for the environment. Changes have had an impact on all factors of environment and have enormous influence on health of population.

Migrations of population caused by the war have increased the problem of municipality waste materials disposal. Improvised landfills became an integral part of the urban ambience. The ratio of rural to urban population was also significantly changed due to war activities. The Statistic Institute and Health Institute estimate that ratio as 80:20 in favor of urban population. This ratio is multi-causal and forced war migrations have a determining part. Also, consequences are numerous and full of psychosocial, cultural, health and other phenomena, and have influence on subject of this report.

During the war and after the Dayton agreement some water utilities were split up, or combined by the redrawing of the boundaries. Facilities and equipment in many areas have been damaged or totally destroyed. Huge deterioration caused by the four-year war period led to a dramatically lowered service level and lack of investments. Reconstruction with substantial institutional assistance began 3-4 years ago and has made considerable progress in restoring services in many areas. Even though the reconstruction of systems has been undertaken, there remains significant work to be done on restoration of the utilities to their pre-war status and to bring the level of technology to current international standards. Until this happens, the environment continues to suffer from leakages from sewage pipes, and poor wastewater treatment.

Municipal water supply, sanitation and solid waste disposal services in Bosnia -Herzegovina were traditionally highly centralized and subsidized. Services were financed and managed for the most part at the national governmental level with local governments playing a role of executing agencies. Tremendous deterioration caused by 4 years of war led to a drastically differed maintenance and lack of investments. Even before the war there existed a serious disrepair of municipal service systems by strictly controlled and non-cost-covering pricing policies that did not allow for proper investment and maintenance. The situation was compounded by serious operational deficiencies and particularly outdated managerial practices contributing as shown to wastewater discharge directly into rivers.

There are numerous and imminent dangers, which are mostly the result of human activities, and these are: loss of cultivable areas, toxic agricultural technologies, unrecoverable loss of rare plant and animal species and ecological phenomena, limited water quantities, wide spectrum of air, water and food contaminants, dependence on damaging and unrecoverable energy resources, forest destruction, etc.

Although well-meaning, the international community has inadvertently contributed significantly to the environmental dilemma. The thousands of foreign SFOR troops and countless international civilians pose a continuing additional load on an already fragile infrastructure. An unintended byproduct of the humanitarian aid campaign, tons of expired pharmaceuticals reportedly remain in storage, while BiH possesses no adequate disposal facilities. There remain local suspicions that the international community has taken advantage of BiH's weak environmental posture to turn the country into a dumping ground.

BiH is at present a country with a complex political structure, and for that reason there are no effective state agencies and institutions governing ecology. This factor is accompanied by low awareness of the majority of the population of ecological issues. The disarranged order of priorities caused by the war make it necessary (through strong, respectable and independent environmental institutions and organizations, the media and educational system) to publicly stimulate successful environmental protection measures and promote a new philosophy of sustainable development and a better quality of life.

### 3. Responses

#### 3.1 Countries' environmental work

##### 3.1.1. *Institutions*

With the signing of the Dayton – Paris Peace Agreement the new state of BiH was formed into two entities, the Federation of BiH and Republic of Srpska. According to the Dayton Peace Agreement, the protection, preservation and promotion of the environment is under the authority of the entities.

Today, the Federation and RS have a different system of organization of ministries of the environment. In the Federation the relevant ministry is the Ministry of Physical Planning and Environment; in RS it is the Ministry of Urbanism, Physical Planning, Construction and Environment.

Two steering committees, the Water Steering Committee (WSC) and Environmental Steering Committee (ESC) were established in 1998 with responsibility for co-ordination and co-operation between competent Ministries of the two entities.

The Federal Constitution determines the organizational structure of the Federation. Ten regional cantons are established. Chapter III of the Constitution deals with the distribution of competencies of the federal and canton authorities. Article 2 (c) of this Chapter prescribes that federal and canton authorities are jointly responsible for the “policy of environment protection” and in Article 2(i) for the “use of natural resources”. However, Article 3 states, “as appropriate, the responsibilities in Article 2 may be exercised jointly or separately, or by the Canton as coordinated by the Federal Government”.

Each of the cantons has their own Constitution and government. Regarding environment, all of the cantonal Constitutions also state that both the Federation and the cantons are responsible for environmental policy, in accordance with the Federal Constitution. The canton's Constitutions provide for the possibility to establish a Council of cantons in order to co-ordinate and harmonize policies and activities of common interest. The Cantons have the option to transfer their responsibility on environment to the municipalities and/or the Federation.

The Constitution of the Federation of Bosnia and Herzegovina [Section IV, C, 3, Article 10(1)(b)] states that the Constitutional Court shall resolve disputes between any Canton and the Federation Government.

Cantons in FBiH also have certain competencies for licensing and allocation of water resources divided between relevant canton ministries.

In both Federation of Bosnia and Herzegovina and Republic of Srpska the principal role for the water sector is within the Ministry of Agriculture, Water Management and Forestry (MoAWF of FBiH and MoAWF of RS) which is responsible for Federal water strategy and policy, the issue of agreements and permits, setting of standards and regulations; and the maintaining of compliance with laws and regulations through licensing and inspections. The Ministry for Physical Planning and Environment (MoPPE of FBiH and MoPPE of RS) has responsibilities in the water and environment sector for activities and measures for water and environmental protection. The

Ministry of Health (in FBiH and in RS) is responsible for safeguarding of the quality of potable water with fewer than five staff allocated to this function.

Under the Law on Water of 1998 in FBiH MoAWF delegates the main competence for preparation of strategic decisions and planning (long-term plans, all regulations, decrees and bylaws necessary for the application of the Water Law) to two Public Companies of Watershed Areas (PCWAs) which are responsible for their administrative zones (River Sava and Adriatic Sea). In RS the same role for the whole RS is allocated to the Public Water Management Enterprise of RS.

### **3.1.2. Policies**

The policy environment within each entity also reflects the distinct ideologies and conservative views of those in power. Taxation, customs controls and sector programmes are governed on an entity rather than state level. Each of ten FBiH cantons also has its own government structure and distinct environmental, social and economic development policies and strategies. With a unitary government structure, policy questions in the Republika Srpska (RS) are more straightforward than in the FBiH, but policy differences between the two entities are still a major issue.

The fact is that there is no any environmental policy on the state level, and only next year, through WB financial support, will the first National Environmental Action Plan be drawn.

The NEAP should be prepared in both BiH entities simultaneously, to assist Bosnia and Herzegovina in the development of a sound environmental legal and policy framework, and strong environmental institutions.

The specific project objective is to develop the environmental action program for the whole of BiH (RS and Federation BiH) which would outline the long-term priorities for development in the country; to provide assistance to the environmental officials to participate in ongoing international processes; to provide assistance in law drafting, policy development and institutional building, etc.

### **3.1.3 Legal framework**

In BiH slow legislative processes have delayed the development of a regulatory framework. This was due to significant burden on Parliament to enact a large volume of new legislation in the current period of economic and political reform and due to the fact the environmental legislation was not a priority issue. In some cases problems arose because lack of capacity to draft high quality environmental laws, as well as the fact that frequently, consultations with relevant stakeholders were carried out at a late stage.

The General Framework Agreement for Peace in Bosnia and Herzegovina put one of the main prerogatives of any state -- administration of justice -- into the hands of the two entities, leaving BiH without any responsibilities in establishing the judicial system (and therefore law enforcement) at the state level. Consequently, BiH is a state with two quite separate legal systems and two judiciaries that rarely meet at the central level. Access to justice for citizens of BiH therefore still stops at entity borders. This is true for doing business as well as for environmental concerns.

On top of the other major issues of individual cantons' approaches to appointing and funding the judiciary, there is a serious problem in both entities of the level of influence local power structures can have on a judiciary that is answerable to a bureaucracy with far higher levels of devolved power than in western democracies. To put it into perspective, the entities in BiH enjoy a far greater level of autonomy than was envisaged for Kosovo at Rambouillet, as they retain total control over all aspects of their destiny, with the exception of foreign policy, customs policy, the Central Bank, and a small number of specified other matters.

## **General legislation**

*The Federation of Bosnia and Herzegovina*

The Constitution of the Federation of Bosnia and Herzegovina was enacted on 30 March 1994, two years before the Dayton Peace Accords. It was brought into alignment with 24 Amendments that were enacted on 5 June 1996. Article 2 of the Constitution, listing all the rights of the individual, does not explicitly mention the right to a healthy environment, as was the case in the Constitution of the former Socialist Federal Republic of Yugoslavia. The list of individual rights also does not include either the right to free access to information or the right to petition. The only reference in regard to these rights is made in Point 2(b) of this Article where it says that the citizens enjoy “equal access to the public services”, assuming that one of those services is protection of the environment.

Chapter IIb of the Constitution, dealing with human rights and elementary freedoms, establishes the institution of Ombudsmen of the Federation. However, it does not give any clear duties to the ombudsmen as to the environmental rights of the individuals.

Article 4 (f) of Section III gives the cantons the exclusive responsibility for “regulating local land use, including by zoning”.

Annex 2 of the Dayton Accords, which addresses transitional arrangements, has a provision that all the laws from the former Socialist Republic of Bosnia and Herzegovina that are not inconsistent with the Dayton Constitution may remain in force. This is significant in terms of the environment because the Law on Urban Planning enforced in September 1987 by this provision has remained in force on the territory of the Federation of Bosnia and Herzegovina.

#### *Republic of Srpska*

The Constitution of the Republic of Srpska was adopted in November 1994. It has since undergone a series of amendments. The Republic of Srpska is a centralised unitary State. Local administration exists only at the municipal level. The Republic is responsible for ensuring environmental protection and the municipalities, in accordance with the law, take care of meeting specific needs of citizens in environmental protection (Article 102.5). A citizen’s right to a healthy environment is incorporated in Article 35: “a person has the right to a healthy environment. Every person shall be bound, in accordance with the law and his/her own capabilities, to protect and improve the environment”. According to Article 59, “the use and exploitation of property of special cultural, scientific, artistic or historical significance, or significant for the protection of nature or the environment, may be restricted against a full compensation to the owner.” Article 64 states that the “Republic shall protect and encourage the following: rational use of natural resources, with the view of protecting and improving the quality of life and protecting and reviving the environment to the general benefit” as well as “conservation and enrichment of historical, cultural and artistic wealth.”

Among the responsibilities of the Republic, Article 68.13 and 68.14 (as amended), require the Republic to regulate and ensure “environment protection” and “public information system”. The right to hold referenda is given indirectly through the National Assembly (Article 70.5 of the Constitution). Article 76 then further elaborates the decision-making process by prescribing that “The President of the Republic, the Government, every Assembly deputy or a minimum of 3,000 voters [...] have the right to propose laws, other regulations and general enactments”. According to Article 77, “the National Assembly may decide to make a decision on some issues falling within its competence after a referendum of citizens has been held”.

The Republika Srpska is completing the drafting of a new environmental protection law. The OHR is preparing a detailed assessment of the draft law on environmental protection for the Federation of Bosnia and Herzegovina. Both Entities have indicated their willingness not to press for the adoption of these drafts, and to await the legislation to be prepared under the new EC Project “Preparation of Environmental Law and Policy in BiH”.

Addition to this, in the Federation of BiH, the Canton of Tuzla has already adopted its own environmental protection law in force only in that canton.

#### *Land Protection and Legislation*

The issue of land protection and controlled usage is generally treated under the Law on Physical Planning. Special emphasis is given to the following areas:

- forests and other vegetation,
- agricultural land of high value or of specific usage,
- areas endangered by erosion or floods,
- karst, flatlands, degraded forests, soils, etc., and
- endangered areas that require special protection.

The detailed instructions on protection and usage of forests and agricultural land are given under the Forest Law and Law on Agricultural Land. There are no special environmental charges/taxes on fertilizers, pesticides or other chemical agents used in agriculture nor there are charges/taxes on land use with clear environmental relevance in our country. The erosion problem is not directly addressed within the above Law. However, certain Articles define the actions that should be undertaken in order to protect the land from eventual harmful results. These include a construction ban in the protection zones, obligatory deposition of humus land, forestation, ground leveling and grass plantation after the certain land works (civil constructions, mining, tree cutting, etc.), ban on discharge of harmful materials (pesticides, oil derivatives, radioactive materials, etc.), etc. The program of conservation work for water and soil, and measures to combat soil contamination do not exist under the present Law. An action plan to combat desertification and measures to combat soil salination are not applicable for Bosnia and Herzegovina.

#### *Water protection legislation*

The water sector is not expressly mentioned in either the Constitution of Bosnia and Herzegovina or the Constitutions of the two Entities.

A new “Water law” was approved in both FBiH and RS after the war. In the new structure the elements of state authority organization (Parliament, Governments of FBiH and RS, Ministries (FBiH and RS) of Agriculture, Forestry and Water) are in accordance with the constitution and are analogous to those existing in the pre-war structure. The difference is essentially the decentralization of competencies defined by the establishment of 10 Cantons in FBiH, and hence the establishment of three different Water Management Enterprises – two for FBiH (Water Management Enterprise of the River Sava Catchment Area, and Water Management Enterprise of the Adriatic Sea Catchment Area), and one for RS.

The Federation Water Law is mainly focused on the establishment and financing of the Public Companies for Watershed Areas (PWCAs) for the Sava River and the Adriatic Sea catchment areas. The Water Law does not contain sufficient provisions on permits, legal procedures, international standards and conditions for water use. In consequence, it fails to provide an effective basis for water regulation. Its main defects are the strong concentration of responsibilities of conflicting interest within the PWCAs and non-alignment with European Union principles, particularly those relating to an integrated environmental approach and river basin management.

#### *Waste legislation*

There is no effective primary or secondary legislation in the Federation of Bosnia and Herzegovina relating to the regulation of waste management activities.

### *Nature protection legislation*

The Federation of Bosnia and Herzegovina has prepared a draft law on nature protection.

### *Air protection legislation*

No effective legislation appears to exist in either entity, for the regulation of emissions to the atmosphere and air quality.

Emission standards were set up before the war through bylaws in 1976. They are rather old and 10-15 times higher than actual standards in Europe. New standards on air emission were set up by Canton Sarajevo (bylaw, May 1999). The limitation values are harmonized with those in EU countries. The following types of emission standards are set up: Emission standards in the air, Emission standards for stationary sources of pollution, Emission standards for heating places, No plan for reducing polluting industrial emissions exists, nor that for the control of pollution from exhaust fumes. There are no air emissions taxes.

### *Environmental licensing*

No effective framework exists for environmental licensing, in either entity.

### *International Conventions*

BiH has not signed any International Convention which deals with the environment since 1992. Only recently (April 2000), BiH's Parliament ratified the Basel and Kyoto Conventions. In order to allow BiH to integrate in international processes/activities there is an urgent need for assistance in systematic preparation to accede to:

- UN Convention on Bio-diversity,
- UN Convention on the Conservation of Migratory Species of Wild Animals
- Convention on Environmental Impact Assessment in a Transboundary Context,
- Convention on the Transboundary Effects of Industrial Accidents,
- Convention on the Protection and Use of Transboundary Water-courses and International Lakes
- The Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters, and others.

### **3.1.4 Financing**

The Law on Physical Planning regulates that polluters pay pollution protection costs in proportion to the rate of pollution they cause. Almost all economic instruments function in cooperation with direct regulations. In that context, the Law on Physical Planning proscribes the taxes in cases when:

- the control and emission of harmful substances in air is not provided,
- wastes are not processed, destroyed or removed,
- agricultural or other land, forests and vegetation cover, coastal areas, lakes and rivers are endangered with harmful substances,
- as a part of regular activities, one does not apply a technology of production or method of exploitation which prevents air pollution above certain levels, or when one does not prevent or remove the harmful consequences of the pollution caused.

Institutions involved in establishment of economic instruments in BiH are the Parliament, Government and relevant Ministries at certain levels (state, entity, canton and municipality). Economic instruments related to the environment (taxes and charges) are not fully implemented in BiH. Charges existing in BiH in last two years are the following:

- vehicle related taxes;
- sewage charges;
- municipal solid waste user charges;
- deposit refund for beverage containers;
- tax differentiation for leaded/unleaded gasoline;
- import duty for used cars or car without catalyst.

VAT is still not fully introduced in BiH. Differentiated taxes lead to more acceptable prices of goods that are ecologically less harmful and vice versa. For example wrapping material made of recycled material, refundable packaging of glass and metal, packaging of wood, of pressurized gas freon, and packaging made of plant material wastes is considered ecologically acceptable wrapping material, and is not taxed according to the Article 12, item 1, point 5 of the Law on Turnover Taxes on Goods and Services. The tax on turnover is paid for other groups of wrapping material.

### **3.2. International financing**

#### **3.2.1 Sida**

The following common goals are characteristic for Swedish aid in Bosnia and Herzegovina (“Landstrategi for arbetet med Bosnien-Hercegovina”, available from Sida):

- To support stability and peace in the region,
- To support the safe return of refugees,
- To support democratic development of the societies through building of democratic institutions and development of the civil society,
- To support socially sustainable market economy, which can help generate sustainable growth and alleviate poverty.

Bosnia and Herzegovina has in a very short period of time become Sweden’s third largest recipient of assistance. The amount committed for assistance for the period 1996-1999 was USD \$125 million. Sida’s support in Bosnia-Herzegovina has mainly been manifested through 250-300 projects on reconstruction, psychosocial support, human rights and democracy, institution building, business and infrastructure and culture. The main goal has been to create peace and support the return of refugees, and in that way support the development of the country. To date, environmental projects have not been a priority activity for Sida support.

Specifically, the Sida support has included the following projects:

#### *Reconstruction:*

- Help to homeowners to repair their houses,
- Re-establishment of local services (such as schools, health centres, water supplies, electricity and telecommunication),
- Mine clearance,
- Help to returnees to start farming (such as seeds, fertilizers, tools and animals),
- Microcredits, and
- Repair of roads and ditches.

#### *Business and infrastructure*

- Assistance for privatisation of banks in Republika Srpska,
- Assistance with a World Bank credit programme for small and medium-size companies,
- Support for building up telecommunications systems and railway traffic, and allocation of means to a risk guarantee fund established by the World Bank.

### *Psychosocial support*

- Development of psychiatric services for children and young people (through training of doctors, psychologists, social workers and nurses),
- Training of children's ombudsmen to work at local level,
- Exchange programme for students between the Schools of Social Studies of the Universities of Stockholm and Sarajevo, and
- "Kvinna till Kvinna" (Woman to Woman) organization gives support to the women's centres run in the Mostar area supported by the Bosnian organization "Stope nade" (Steps of hope).

### *Human Rights and Democracy*

- Support of independent media (such as "Nezavisne Novine" and "Reporter" in Banja Luka),
- Support to organizations working with further education, research and the supervision of the media situation in the country, and
- Support to local democratic initiatives (such as Democratic Initiative of Sarajevo Serbs and the Committee for Human Rights in Livno).

### *Institution building*

- Support to capacity and institution building in the private and government sectors,
- Support to modernization of land surveying techniques and databases,
- Support to establishment of a Bosnian civil aviation authority,
- Improving the capacity of the police and the production of statistics, and
- Support to development of twinning co-operation between municipalities in Bosnia and Sweden.

### *Culture*

- New methods have been developed in Bosnia-Herzegovina for the restoration of objects of cultural and historical value,
- Support to the National Museum in Sarajevo,
- Co-operation between the colleges of music in Sarajevo and Stockholm, and
- Co-operation between the film festivals of Gothenburg and Sarajevo has been established.

So far, there have been no particular environmental programmes in Bosnia financed by Sida, and thus there are no particular routines for follow-up of the effects on environment. Considering Swedish reconstruction efforts, Sida claims that only environmentally friendly and locally produced materials have been used.

Looking at Sida's contribution to sustainable development of Bosnia and Herzegovina, it can be said that past efforts have admirably covered different sectors, like poverty alleviation, health, institutional strengthening, economy, gender and national equality.

When it comes to the national environmental strategies, environmental plans etc., Sida should always consider these when planning development support. Since the situation in Bosnia and Herzegovina is rather complicated there is no clear environmental policy on the state level, with the result that Sida support could not be effectively based on any real environmental action plan. During the course of next year (2001), a national environmental action plan (NEAP) will be developed, and outline the long-term priorities for the environment in the country.

Sida is very keen on co-ordinating its activities with other donors. In Bosnia and Herzegovina, the main co-ordinating body is the Office of the High Representative (OHR). All international donors must report their activities in the country to the OHR. However, according to Sida, the co-ordination of donor activities has not been sufficient.

According to Sida's own evaluation within its report "Sweden's Assistance to Bosnia and Herzegovina – A study of aid management and related policy issues", (Claes Sandgren, 1999), the general prospects for effective assistance to Bosnia and Herzegovina are poor since the country's authorities and politicians are not committed to reform. Moreover, the evaluation points out that the Bosnian ownership of many projects has been weak and diffuse.

For future development co-operation, Sida is presently in the process of elaborating a new development strategy for Bosnia and Herzegovina (available from Sida's publication centre). The emphasis for the development co-operation in the next ten years will be policy and institutional reform, particularly on the canton and municipality level. Moreover, Sida intends to continue to support democracy, human rights, equality, culture and the health sector. Strengthening of the environmental profile within existing and future projects is also planned. The suggested development strategy will require strong Bosnian ownership of all projects.

### **3.2.2 Others**

A wide range and number of governmental and non-governmental organizations, UN, WB, international associations, and other types of donors or commercial organizations are working in BiH. Only in Sarajevo, there are over 100 different registered foreign organizations.

There were very few "direct environmental activities" (financially) supported by international donors in BiH during the last decade.

The EC has at present the following priorities in BiH;

Integrated refugee assistance in its 1999 return program to which EUR 69 million has been allocated includes the following components: rehabilitation of housing and associated infrastructures (EUR 44 million), stimulation of economic regeneration and job creation (15 mil. EUR), mine clearance (EUR 4 million), business advisory /quick impact employment creation fund (EUR 4 million), and micro projects (EUR 2 million).

Economic regeneration projects contribute to improving the business climate, and provide direct support for the development of the private sector.

The transport program represents a major investment on the part of the EC in the reconstruction effort in BiH. It includes support in the field of civil aviation (Sarajevo, Banja Luka and Mostar airports), and repairs to road and rail links. By the end of 1999 projects in the transport sector with a value of EUR 33.37 million had been contracted and were advanced.

Energy sector related projects include: Doboj District Heating system, Sarajevo District Heating and Sarajevo Gas projects.

Substantial funding has also been earmarked for reconstruction purposes in Sarajevo.

Some funding (EUR 4 million) has been provided for funding the agriculture sector, especially for assisting returning refugees and displaced persons with a farming background.

Institutional related activities have been supported by several EU programs in the past.

## **4. Conclusions and Recommendations**

International organizations involving domestic experts and discussing projects with the local community in the early stage of project creation proved to be more successful, and these projects are reaching a higher level of sustainability. This kind of project avoids a technocratic top-down approach, which is the most inefficient for the development of BiH.

It is safe to say that Bosnia and Herzegovina finds it difficult to agree on any common national interest that would serve as a blueprint for development. The failure to define a vision and

transform it into a common policy paper on at least crucial areas for the future of the country is often concealed behind prolific rhetoric about “joining European integration and accepting European standards”, often heard by all political leaders.

The strategic framework:

- in the short-to-medium term, donor support must continue to technically and materially support areas which need public rather than private investment;
- donors should meanwhile advocate for policy change;
- donors should also advocate for support the empowerment of local communities to define their own needs and insist that leaders and administrators are more responsive to real needs and democratic controls;
- the donor community should support economic, legal and institutional reform;

This Strategic Environmental Assessment should assist Sida in coordinating its (environmental) reconstruction efforts in the region, and prevent duplication of activities. It is essential that the future programs make the best use of the structures and resources already existing in BiH and the region, backed up by international specialist and technical assistance resources.

The only way out for this country is through interaction between existing obstacles and future sustainable development. One cannot wait for the other to disappear or emerge. Bosnia needs to develop in spite of all inconsistencies of its political structures and its legal system.

BiH has a plenty of priorities to be addressed concerning its present state of environment, and one of the most difficult ones is landmine clearance (“demining”). This activity is of the utmost importance in post-war Bosnia and Herzegovina, and a precondition for sustainable (rural) development, agriculture, tourism etc.

### ***Final remarks***

As a European country, Bosnia has to find its place within the regional policies of the EU and will have to have a share in the Stability Pact perspectives. In that context, the country will find itself potentially in an ideal situation: drawing on good values from its past together with other countries that have emerged from the former Yugoslavia, and looking to the future association with European integration via the Stability Pact for South-Eastern Europe.

Development programs have to be carefully chosen in order to strike reconciliation between the European legacy of Bosnia and the humiliation of its people during the war. BiH has a wealth of talent, experienced professionals and a strong desire to develop sustainable institutions and a prosperous society. Many of these people know each other from the past, grew up together, studied together and worked together. Networking between these professionals can create a “pre-policy” framework of technical consensus that might later induce or stimulate changes in the more political arena.

BiH is also blessed with a strong natural resource base in relation to the size of its population. There is ample scope for diversification, creating new sources of income (alpine sports, eco-tourism, organic farming, light industry based on food processing etc etc) to provide a good standard of living for all the population. In so doing, BiH can at least benefit from one major consequence of the war, the demolition of the large, inefficient factories that once polluted its beautiful landscape. It should continue to enjoy the clean air and other advantages that war sometimes brings at such great cost.

The continuing political and ethnic conflicts and divisions in Bosnia make it difficult to avoid partisan analyses of even environmental issues. But, two things are clear; first, that the war itself was a tragedy not only for the country’s people but also -- directly and indirectly -- for its environment, natural and cultural; second, that its consequences will dominate the future for many years to come.

Nationalism, and lack of a developed society and effective oppositional politics in BiH comprise the flip side to poverty, dependency and isolation. Both are obstacles to environmental progress; the environment can provide a focus for tackling both.

Some environmental projects should be identified based on reports. Regarding institutional strengthening and policy development, the following activities should be considered:

- Cooperative development of National Environmental Action Plan (for both entities), which should outline medium- and long-term priorities for environmental development in BiH
- Cooperation with entities' governments to develop a priority environmental investment program for BiH;
- Cooperation with entities' governments in drafting environmental legislation, developing Environmental Impact Assessment and Strategic Environmental Assessment legislation and policy;
- Assistance to BiH government(s) on different levels (entity, canton, municipality) to develop project preparation capacity for environmental investments, EMS etc.
- Assistance to BiH entities' governments to develop viable environmental funds and enact "green budget reforms";

Furthermore regarding institutions the following national and local environmental programs could be considered:

- Development of Local Environmental Action Plans;
- Local Agenda 21
- Environmental Management System – ISO 14 000
- Cleaner Production Centers
- Development of eco-tourism, healthy food production, etc.
- Support for the implementation of priority projects identified by the BiH authorities

Many of BiH's governmental institutions with environmental responsibilities have yet to establish continual and regular monitoring of water and air pollution, so it would be necessary to introduce the continual monitoring of air quality & water, at least in urban areas as a valuable tool to support informed decision-making.

Also, it is obvious that BiH's (entity) government officials are aware of the urgent need for promoting transparency and openness of its governance. Future projects emphasizing this issue will help screen practices of different selected ministries having an impact on the environment concerning transparency in decision-making, access to information and public participation. Recommendations would be developed together with government officials, NGOs and experts to establish mechanisms (such as NGO-government dialogue, electronic networks and Internet access points, public consultations, etc.) for better access to information and public participation. In case there is real commitment from the authorities, the recommendations could be implemented in practice. The project results can facilitate the achievement of greater transparency and openness of selected government institutions.

Another suggestion would be a "BiH Environmental Law Counseling Center" for lawyers or organizations of lawyers to set up and operate environmental legal advisory service centers, with the aim that such centers will become self-sustaining in the future. Such a project should strengthen the capacity of environmental civil society in the use of legal tools for environmental protection and public participation in environmental decision-making. The center can also provide assistance in legal matters relevant for the operation of NGOs such as registration, organization, taxation, etc. A part of the activity of the centers could be to test the application of the Aarhus Convention, which recognizes that the rights and opportunities provided in connection with access to information and public participation must be backed up by legal and institutional guarantees. The evolution of such

guarantees will take time, but the process can be speeded up by the support of persons whose rights have been denied them in seeking access to justice through administrative or legal process.

Aside from the abovementioned activities a few more programmes deserve priority for implementation (if there is funding available) such as:

- Formation of National Parks
- Establishment of environmental inspection throughout the whole country
- Sustainable recycling program

All of these need training of competent staff in order to be implemented.

Regarding civil society building in BiH the following activities should be considered:

#### *NGO Capacity Building and Training*

*Integrated training publications, curricula and courses (building training capacity)* - New materials (or already existing ones) need to be packaged in such a way as to reach NGO constituents. Often materials are in English; these need translation and distribution. Also curricula for training must be adapted to the conditions and cultural situation in the Bosnia and Herzegovina. It is crucial that existing materials are utilized and existing training programs support other NGO programmes on initiative. Development of local training capacity is a major focus. This would be through *Training of Trainers* courses.

#### *Support to NGO Service Centers*

*Service center conference/workshop* - There needs to be a process of bringing all forms of NGO service centers together. There are many common issues and also a duplication of efforts that has to be addressed. Additionally there are some NGO groups which tend to fall out of the support from centers due to a lack of awareness, or the specific tailoring of programs. Skill sharing could be a positive element, with the support of exchanges and training. Such measures would identify the current projects and programs of NGO service centers and devise needs for their further development.

#### *Conferences/Workshops for Journalists*

Conferences and workshops could assist journalists, environmental and other, in identifying the key issues to be reported on relating to the environmental rehabilitation of the BiH. The aim of this initiative is to help journalists answer questions such as: What should they really be tracking and looking out for? What is “environmental progress” after the conflict? What are the main issues related to environmental security and stability in the region? What are lessons learned from Bosnia? Where can they turn to for information? What are international organizations doing, and are they being successful or useful? etc.

#### *BiH's Sustainable Development Information Centre*

A central Information Centre is required to collect, index and disseminate to the public all relevant new information related to the effects of the war on the environment and rehabilitation efforts, including new laws and international initiatives. This report could also be summarized in an easy-to-read public brochure in the Bosnian language and distributed. This will help foster greater general public awareness of the environmental issues in the BiH, and will help journalists in their search for timely and useful information. Key components will include a free information request service, an email list to which new information will be sent at regular intervals, and a searchable website. The work of the Centre will also help to minimise duplication of donor efforts.

### *Communications and Information Dissemination Training Program*

This program could train NGOs and local governments in the need for, and methods of, communicating their environmental activities to the public and to journalists, in order to raise environmental awareness. Part of this will include methods for environmental information dissemination, including press releases, press conferences, newsletters, publications and websites. Best practices will be presented as models. Workshops will be directed both at individual organizations and authorities, as well as larger workshops involving representatives from different organizations/authorities to network and exchange experiences.

### *Directories of Environmental Stakeholders in BiH*

Directories of environmental stakeholders are very useful in providing contact information to other stakeholders, and fostering co-operation, and networking, between the general public and journalists about key players involved with the environmental rehabilitation of the country. Stakeholders include NGOs, government (entity and local), business, academic and international organizations. Separate directories can be made for separate stakeholders or one directory can include all stakeholders organized under environmental themes.

In more detail, a possible pilot project for Sida's future involvement:

The EU project, Institutional Strengthening of the Water Sector in BiH - Human Resources Development Aspect, assessed the problem of staff shortages as well as lack of skilled staff as the weakest point of the environmental sector in BiH. This is especially a problem for development of an environmental monitoring network. In the existing educational system in BiH there is no high school, faculty or department in the university that would treat specific subjects related to hydro-meteorological and geophysical monitoring, improvement and protection of the environment, or sustainable development as a widely accepted concept of economics.

The European Union has long since recognized the importance of education in the promotion of sustainable development within a country. So as to integrate environmental issues into its own education and training programs, the same should now be applied in BiH. Toward this aim is a plan to establish the BiH Education Center in the city of Neum. This idea was conceived by the Federal Meteorological Institute, MAP Office for BiH and the Municipality of Neum. Some support has already been given by the Public Water Management Enterprise of FBiH, the Hydro-meteorological Institute of Republic of Srpska, the Public Water Management Enterprise of the Republic of Srpska, and the Canton to which Neum belongs, as well as from international organizations (including REC, USAID and OHR).

Main program objectives of this Education Center might include:

- 1. Environmental science**, introducing environment issues in BiH and trying to integrate different relevant disciplines and social interests.
- 2. Environment policy and management**, offering an introductory approach to strategies and instruments that could be applied toward prevention or solving of environmental problems and improvement of sustainable development in BiH.

This could include two different levels:

- ? *government environment policy* on different levels in BiH, planning methods and policy evaluation, political and economic instruments for implementation and enforcement;
  - ? *industrial environment management in BiH*, possibilities and constraints of technological and organizational solutions for environment problems.
- 3. Environmental engineering**, with programs on basic aspects of air, water (surface and underground water, sea water) and land, monitoring procedures, and urgent interventions on incident pollution, so as to manage natural and technological risks in relevant river basins.

A global objective of the establishment of the Education Center is human resources development in the environment and water sectors in BiH, and wider in the SEE or CEE region. The Education Center would offer:

- Short training courses for technical staff to operate modern equipment for environment monitoring, apply standards, and establish and regularly update databases etc.
- Short training courses for staff from public communal enterprises (water supply, waste water disposal and treatment, solid waste collection and disposal, produce markets, cemeteries and parks management etc.);
- Short training courses related to environmental issues in different industrial sectors, including introduction of clean technologies, recycling, waste water treatment and similar;
- Advising canton or municipal authorities dealing with environment;
- Joint inter-entity projects and programs between BiH and other countries belonging to Danube river basin or Mediterranean area.

Reasons for the establishment of the BiH Education Center in Neum, considering the lack of properly developed environmental praxis in BiH in recent years, are:

- the trend toward environmental degradation and irrational resource usage in the former socialist period;
- need for initiatives on adoption of environmental criteria supporting the sustainable development of BiH;
- promotion of integrated environmental management in BiH, respecting the protection of environmentally important areas and rational natural resources usage;
- external influences -- need to achieve and follow Central-European and Mediterranean or European trends in environment policy, providing preconditions for ratification and full implementation of Danube and Barcelona Conventions and its protocols;
- societal demands, growth of public awareness, transparency and availability of information.

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Annex I Structure of total land area in BH according to the basic land categories in 1990

<i>Land category</i>	<i>Area in hectares</i>	<i>Total in %</i>
Agricultural	2,525	49.4
Forest	2,331	55.6
Infertile	257	5.0
Total	5,113	

Source: Statistic Annual BH, 1991 and Statistic Annual of Yugoslavia, 1991

Annex II Land Areas per Basic Categories in Two Entities in Bosnia and Herzegovina in 1996

<i>A) Area in 000 hectares</i>	<i>FBH</i>	<i>RS</i>	<i>BH</i>
Agricultural area	1,168	1,299	2,467
Forestry area	984	1,055	2,039
Unproductive area	106	128	234
Total area	2,258	2,482	4,740
<b>B) Structure in % (for each entity and for BH total area =100)</b>			
Agricultural area	51.7	52.3	52.0
Forestry area	43.6	42.5	43.0
Unproductive area	4.7	5.2	5.0
Total area	100.0	100.0	100.0
<b>C) Structure in % (for each category of area BH = 100)</b>			
Agricultural area	47.3	52.7	100.0
Forestry area	48.2	51.8	100.0
Unproductive area	45.5	54.5	100.0
Total area	47.6	52.4	100.0

## Annex III Agricultural Land

	<b>FBH</b>	<b>RS</b>	<b>BH</b>
<b><u>A) Area in 000 hectares</u></b>			
1. Ploughed fields and gardens	460	595	1,055
2. Orchards	46	54	100
3. Vineyards	3	1	4
4. Meadows	257	126	383
5. Total arable land	766	766	1,542
6. Pastures	401	465	866
7. Fish ponds, pools and reeds	3	4	7
8. Total uncultivable land	404	469	873
9. Total agricultural area	1,170	1,246	2,415
<b><u>B) Structure in % (each area = 100)</u></b>			
1. Ploughed fields and gardens	39.3	47.8	43.7
2. Orchards	3.9	4.3	4.1
3. Vineyards	0.2	0.1	0.2
4. Meadows	22.0	10.1	15.8
5. Total cultivable land	65.4	62.3	63.8
6. Pastures	34.3	37.3	35.9
7. Fish ponds, pools and reeds	0.3	0.33	0.2
8. Total noncultivable land	34.6	37.6	36.1
9. Total agricultural area	100.0	100.0	100.0
<b><u>C) Structure in % (BH = 100)</u></b>			
1. Arable land and gardens	43.5	56.5	100.0
2. Orchards	46.0	54.0	100.0
3. Vineyards	75.0	25.0	100.0
4. Meadows	67.1	32.9	100.0
5. Total cultivable land	49.6	50.4	100.0
6. Pastures	46.3	53.7	100.0
7. Fish ponds, pools and reeds	42.6	57.4	100.0
8. Total noncultivable land	46.3	53.7	100.0
9. Total agricultural area	48.4	51.6	100.0

Source: Unpublished data of the two entities' statistic institutes

## Annex IV Number of livestock in two entities and in Bosnia and Herzegovina on 31.12.1997

	Number of livestock			Structure in % (BH=100)	
	FBH	RS	BH	FBH	RS
Cattle	216,731	200,973	417,704	51.9	48.1
Milk stable cows	158,801	150,730	309,531	51.3	48.7
Milk cows	129,919	134,652	264,571	49.1	50.5
Sheep	263,781	316,712	580,493	45.4	54.6
Ewes for breeding	189,246	237,534	426,780	44.3	55.7
Milk stable ewes	150,333	65,215	215,548	69.7	30.3
Pigs	80,865	291,789	372,654	21.7	78.3
Sows and sows of the first farrow	12,928	49,604	62,532	20.7	79.3
Horses	30,313	26,494	56,807	53.4	46.6
Mares and fillies and foals	7,101	11,127	18,228	39.0	61.0
Poultry	1,877,488	2,087,183	3,362,488	55.8	44.2
Hens	1,177,907	1,485,000	2,662,907	44.2	55.8

Source: Statistic Annual FBH 1993-1997, page 147-148 (for BH) and unpublished data (for RS).

## Annex V Comparative review of animal production in BH in 1990 and 1997

	Year 1990	1997	Difference	Index 1997 = 100
<b>A) Meat production</b>				
<b>A) 1. Gross weight</b>				
Cattle	71,920	30,880	- 42,040	53.3
Sheep	25,323	6,410	- 18,913	25.3
Pigs	68,496	25,170	- 42,326	36.7
Poultry	16,504	8,440	- 8,064	51.1
<b>A) 2. Net weight</b>				
Cattle	37,918	16,060	- 21,858	42.3
Sheep	12,914	3,240	- 9,674	25.1
Pigs	53,426	19,030	- 34,396	35.6
Poultry	11,552	5,880	- 5,672	50.9
Other	7,700	3,500	- 4,200	45.4
<b>Total</b>	<b>123,510</b>	<b>47,710</b>	<b>- 75,800</b>	<b>38.6</b>
<b>B) Milk in 000 liters</b>				
Cows	854,906	355,706	- 499,200	41.6
Sheep	13,460	6,597	- 6,863	49.0
<b>Total</b>	<b>868,366</b>	<b>362,303</b>	<b>- 502,063</b>	<b>41.7</b>
<b>C) Eggs in 000 pieces</b>	<b>406,747</b>	<b>250,500</b>	<b>- 156,247</b>	<b>61.6</b>
<b>D) Wool in tons</b>	<b>1,628</b>	<b>735</b>	<b>- 893</b>	<b>45.1</b>

Annex VI Table 1. POLLUTION LOADING PER WATERCOURSES

River basin	Total Number of Inhabitants per River Basin	Pointed Sources (PE)		Non-Pointed Sources – Input per Medium Precipitate Year (kg/day)			
		3	4	6	7	8	9
		Municipal Sewage over 2000 inh (PE)	Industrial Wastewater (PE)	COD	BOD5	N	P
Neretva	436271	222633	147725	27974	5358	13789	1124
Trebisnjica		44833	12950	1621	322	1572	94
Cetina	79088	30917	20350	3498	799	3476	222
Glina i Kupa	129348	17917	13400	9377	864	1423	120
Una	491025	247183	1409425	39926	4661	12417	1089
Vrbas	514038	358650	2246075	15265	3066	9039	725
Ukrina	117623	54967	16300	14592	1925	3502	433
Bosna	1818941	1330583	2024850	40363	7489	15293	1399
Drina	422422	144467	264475	4207	4207	9976	852
Sava	517730	255483	717550	38300	4775	9907	1285
<b>Total</b>	<b>4526487</b>	<b>2707633</b>	<b>6873100</b>	<b>195120</b>	<b>6479</b>	<b>18837</b>	<b>1440</b>

## Annex VII

### Regions damaged by surface excavations

Area	Surface in hectares
Kreka	3 600
Ugljevik	1 879
Banovići	1 879
Ljubija	1 609
Đurđevik	1 050
Kakanj	806
Zenica	850

Total damaged surface by exploitation of raw-goods is 12 839

## Annex VIII Administrative Bodies Responsible for Environmental Protection

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### **Ministries**

#### *STATE LEVEL*

#### MINISTRY OF FOREIGN AFFAIRS

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#### ENVIRONMENTAL STEERING COMMITTEE FOR BOSNIA AND HERZEGOVINA

On July 11<sup>th</sup> 1998 in Szentendre, Hungary, the Entity governments signed a "Memorandum of Understanding between Federation of Bosnia and Herzegovina and Republika Srpska concerning the establishment of an Environmental Steering Committee". The Memorandum of Understanding acknowledges that:

- Environmental issues do not recognize the boundary between the Entities, and environmental problems are not constrained by man-made boundaries;
- There is an urgent and important need to find solutions to environmental problems; and
- The Entity governments recognize the need for a mechanism for inter-Entity cooperation.

Four representatives from each Entity take part as voting members of the ESC. "The task of the Committee is to coordinate the parallel work on the level of the entities in the area of international environmental agreements according to their procedures and to present the results for the further procedure to the common (state) authorities."

#### **Members**

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71 000 Sarajevo

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Mr. Mladen Rudez, ESC Member

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Mr. Vladimir Beus, ESC Member

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**Minister**

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## Environmental Monitoring

---

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---

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### **Administrative Bodies Responsible for Enforcement and Control of Environmental Regulations**

---

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### **Cantons within the Federation of Bosnia and Herzegovina**

---

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HERCEGOVACKO - NERETVANSKI CANTON / ZUPANIJA

## **List of interviewed persons**

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- Federal Ministry for Physical Planning and Environment - Sarajevo (Mr. Mehmed Cero, Secretary General, Mr. Mladen Rudez, Assistant Minister for Environment);
- Ministry of Urbanism, Physical Planning and Environment in Middle Bosnian Canton – Travnik , (Ms. Lejla Salkic, Assistant Minister, Mr. Hazim Zuka, Cantonal Environmental Inspector and Mr. Vladislav Vavra, Assistant Minister);
- Ministry for Urbanism, Housing, Communal Work, Civil Engineering and Ecology of Republika Srpska – Banja Luka (Mr. Milenko Stankovic, Assistant Minister; Ms. Radmila Kostic, Head of Environmental Department, Mr. Jovo Radic, Environmental Lawyer);
- Co-chairmans and members of BiH’s Environmental Steering Committee (Prof. Dr. Borislav Jaksic, Prof. Dr. Tarik Kupusovic, Prof.dr. Vladimir Beus, Mr. Boro Mandic);
- Ministry of Reconstruction, Development and Environmental Protection of Sarajevo Canton (Ms. Suada Krvavac, Head of Env. Dpt.); etc.

### ***International Organisations :***

- UNDP (Ms. Irene Bernal), UNICEF (Dr. Selena Bajraktarevic), UNOPS (Mr.Mitchell Carlson), UNECE (Mr. Branko Bosnjakovic), ...
- WB (Ms. Rita Klees, Mr. Goran Tinjic), EC (Mr. Eric Baume, Mr. David Hardman, Mr. Stuart Brown), EBRD (Ms. Zsuzsana Hargitay), OHR (Mr. Claudio Enggist, Mr. Stuart Thompson, Ms. Dijana Spasojevic,...); USAID-BF (Mr. Ron Sisseem); AEA, IMG...etc.

### **NGO sector:**

- EKOBIAH (Prof. Sulejman Redzic, Mr. Samir Dug); FONDEKO (Prof. Dubravka Soljan), BETA (Mr. Branko Vucijak), all from Sarajevo; OAZA-Doboj (Mr. Zoran Pavlovic) ; EKOS-Banja Luka (Prof. Nedovic), OAZA – Mostar, “Greens” of Travnik, Zenica, Tuzla, etc., and
- a number of Scientists & Environmental Expertss, presented on the “Environment Steering Committee No15”, held in Banja Luka, in May 2000.