REPUBLIC OF CROATIA

2007 STATE OF THE ENVIRONMENT REPORT HIGHLIGHTS

Republic of Croatia

2007 State of the Environment Report Highlights

CROATIAN ENVIRONMENT AGENCY

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Introduction

The right to a healthy environment is not just a constitutional prerogative of the Republic of Croatia, but also a long-term pledge to our future.

The State of the Environment Report is a strategic document that is presented to the Croatian Parliament for discussion and adoption every four years. The Report provides an assessment of the overall state of the environment at the national level. It also provides an overview and evaluation of environmental trends and loads, thus facilitating the assessment of the effectiveness of environmental policy measures implemented during the reporting period.

The State of the Environment Report of the Republic of Croatia for 2007 was discussed during the 25th session of the Croatian Parliament and adopted on 25 May 2007.

Since the preceding State of the Environment Report discussed by the Croatian Parliament only covered the period until 1996, the present Report is an exception since it deals with the period from 1997 to 2005.

The State of the Environment Report of the Republic of Croatia for 2007 is an extensive document of 308 pages with an in-depth presentation of the state of individual environmental components – air, soil, waters/sea, biological and landscape diversity. It describes environmental pressures on individual sectors in the reporting period, provides an overview of the state and trends in implementing general environmental policies and objectives, and makes recommendations to improve the situation.

Because of the scope and detailed elaboration in individual Sections, the full report is not suitable either for bringing this problem area closer to a wide circle of all stakeholders, or for presenting the basic results outlined in the Report to the general public.

However, the need to make the essential findings of the state of the environment in Croatia and the most important indicators contained in the Report available to all stakeholders resulted in this summary document entitled Highlights of the State of the Environment Report of the Republic of Croatia for 2007.

Apart from basic information on methodology, limitations and preparation of the Report, this document provides an expanded summary of the Report, the highlights of the conclusion of the Report, and recommendations to improve the state of the environment.

This document closely follows the full text of the State of the Environment Report of the Republic of Croatia for 2007. All data contained in the full report are inclusive to the year 2005. Therefore, despite any changes that occurred in specific areas in the meantime, this more recent data has not been presented to maintain the unambiguousness of the approach.

We hope that this summary of the State of the Environment Report of the Republic of Croatia for 2007 will contribute to a better understanding both of the basic achievements and current problems in each individual area, and that it will also provide for simpler and better monitoring of changes until the preparation of the next Report.

1. Basic Data on the State of the Environment Report

• STATUTORY OBLIGATIONS TO PREPARE A REPORT, AUTHORS AND ORDERING PARTIES

The preparation of the State of the Environment Report is legally mandated by the Environmental Protection Act[1]. The Report is submitted by the Government of the Republic of Croatia to the Croatian Parliament every four years and is presented for endorsement by the Ministry of Environmental Protection, Physical Planning and Construction. The Croatian Environmental Agency is responsible for the preparation of the Report. The Report covers the period from 1997 to 2005, with 1997 being a reference year. In cases where relevant data were available, the trends since 1990 have also been presented.

• PURPOSE OF THE REPORT

The State of the Environment Report of the Republic of Croatia for 2007 evaluates the current state of the environment on the basis of available data. The use of indicators to provide an overview and to evaluate the state of the environment ensures a systematic approach. It also makes the monitoring of the state, the loads and improvements made in certain environmental areas during the reporting period and in future periods simpler and easier. At the national level, this ensures monitoring the effectiveness of individual environmental policy measures that have been implemented. At the international level, it ensures the comparability of the environmental data of the Republic of Croatia with data provided by other European countries. In this way the State of the Environment Report becomes both an important tool in planning environmental policies and an indicator of the need to incorporate environmental protection principles into development and strategic documents of other sectors of the economy, such as agriculture, tourism and energy.

The State of the Environment Report of the Republic of Croatia for 2007 is also important in light of Croatia's impending accession to the European Union (EU) and will surely represent an essential basis for the assessment of the state of the environment in future negotiations.

• METHODOLOGY OF THE REPORT

Since an integrated, national level Environmental Information System is still being established, the methodology of preparing the Report was based on the preparation of underlying documents, on the collection of data by institutions in possession of the relevant data, and on the processing, standardization and harmonization of data thus acquired. The preparation involved six ministries: the Ministry of Environmental Protection, Physical Planning and Construction, the Ministry of Agriculture, Forestry and Water Management, the Ministry of Culture, the Ministry of Economy, Labour and Entrepreneurship, the Ministry of Sea, Tourism, Transport and Development and the Ministry of Finance. It also included a number of national institutes, such as the National Meteorological and Hydrological Service, the National Bureau of Statistics, and the State Institute for Nature Protection; and 18 other academic, scientific and professional institutions and companies specializing in specific aspects of the environment.

1 Official Gazette Nos. 82/94, 128/99

• REPORT FORMAT AND CONTENTS

The Report consists of five sections: Section 1 – Sectoral Pressures, Section 2 – Environmental Components, Section 3 – General Environmental Issues, Section 4 – Conclusion and Section 5 – Annexes, comprising a total of 22 chapters.

The first section of the Report deals with environmental loads and trends and an evaluation of the state arising from environmental pressures exerted by individual sectors. Nine sectors have been evaluated: space and population, energy, industry, agriculture, forestry, fisheries and aquaculture, transport, tourism and chemicals. The aim is to assess total environmental pressures exerted by each of the sectors. Evaluations of the state and trends contained in one sector are primarily intended for decision-makers in other sectors, and for scientific, financial and wider stakeholder circles.

The second section of the Report gives an in-depth evaluation of the state and trends of individual environmental components: air, water, sea, soil, biodiversity, waste and environment, and health. This section is very detailed and extensive and is intended primarily for institutions and individuals involved in its specific areas.

The general environmental issues contained in the third section of the Report consist of an overview of the general institutional framework for implementing environmental policies (international commitments, legislative and institutional strengthening, education, public interest), an overview and evaluation of the effectiveness of environmental policy implementation (implementing objectives set by the National Environmental Strategy and the National Environmental Action Plan, implementing policies at the regional and local level, formulating environmental documents at the local and regional level), an overview of environmental policy instruments and measures, environmental developments, economic instruments, environmental inspection, investments, etc.

The fourth and final section of the Report presents the key problems both by individual sectors and by environmental components, thus pointing to areas and problems that call for special attention and activity.

The Report also contains the following Annexes that make it easier to follow the document: 1. A List of Indicators in the Report; 2. A List of International Treaties, and 3. A List of References (bibliography), including an Appendix containing an overview of the priorities, objectives and measures of the National Environmental Strategy and the National Environmental Action Plan.

• INDICATORS – AN EFFICIENT WAY TO MONITOR THE ACHIEVEMENT OF OBJECTIVES

In this Report the monitoring and evaluation of the state are indicator-based. By definition, an indicator is a representative numeric value of periodic measurements of a case observed. Through data processing information is derived that is an efficient way to monitor changes and to evaluate the state of a specific environmental segment.

Since a national list of indicators for individual areas is still being prepared, indicators for the Report were selected on the basis of availability, importance for evaluation of the state of the relevant area and their inclusion in the list of the most important EEA indicators (Core Set of Indicators). A total of 198 diverse indicators were processed and presented.

The state of each individual sector or thematic area was defined by means of indicators and compared with the objectives defined within the framework of the National Environmental Strategy and the National Environmental Action Plan. The evaluation of the current state with regard to objectives set was presented by a simple and easily understandable symbol.

• LIMITATIONS OF THE REPORT

The quality of the Report is directly related to the quality of data and information available. Since an Environmental Information System that will incorporate all available data and facilitate comparisons, evaluations and the control of data collection is still in the process of establishment, the authors have relied on existing sources of data, i.e. data and measurements provided by institutions historically dealing with a specific area when preparing this Report.

2. Expanded Summary of the State of the Environment Report

The level of social and economic pressures on the environment in Croatia is conditioned by the overall development of the country in this reporting period, i.e. from 1997 to 2005. This development was characterized by consequences of the war, transitional processes in the economy and the gradual introduction of European standards as part of the EU accession process.

During the Homeland War, economic activities declined in all sectors. Gross domestic product (GDP) dropped by some 35 percent and energy consumption by almost 30 per cent. The situation changed in 1997. In subsequent years economic activities increased, reaching the total pre-war level in some sectors of the economy. Consequently, in the early 1990s sectoral pressures on the environment showed a marked minimum, but they are now approaching their pre-war intensity. However, considerable differences are noticeable in relation to the structure of pressures by individual sectors.

Although targeted at the revitalization of economic activity in the post-war period, environmental protection was not considered either a development priority of the Republic of Croatia or a positive political attitude. However, the country's increasingly intensive preparations for a full accession to the EU have for some time contributed considerably to an improvement in environmental policies. This attitude was fuelled by an increasing awareness of the economic value of a well-protected environment, which, in turn, was a consequence of tourism revitalization and the desirability of Croatia as a tourist destination.

Within the framework of the National Environmental Strategy and the National Environmental Action Plan of 2002 the main environmental objectives for individual sectors were defined and a set of measures enacted to accomplish those objectives. The results achieved by individual sectors so far have differed substantially.

2.1. SECTORAL PRESSURES

• A GROWING URBANIZATION AND A DECREASING POPULATION

The area of the Republic of Croatia is an outstanding national asset characterized by a unique landscape and architectural diversity. The diversity of geography and processes taking place here have been influenced by historical circumstances such as population migrations, the proximity of its borders, wars, etc. The consequences of the 1991-1995 war on the environment are still being felt – an area of 1,200 km^2 still contains landmines and wartime destruction has caused a migration of the rural population to urban areas. Urban areas, and the transport corridors that link them, are constantly spreading. Population concentration in the cities is continuing despite a drop in the country's total population. As a result, half of Croatia's population inhabits 26.8 per cent of its mainland. This phenomenon is especially evident in the population growth in the suburban areas of Zagreb and the regional centres of Split, Rijeka, Zadar, Osijek and others. Approximately 25 per cent of the population is concentrated in Zagreb and the County of Zagreb, an area that covers 6.6 per cent of the country's territory. Such a population growth in urban areas results in uncontrolled and often illegal

construction and degradation of the landscape and urban identity. In general, Croatia has a problem with uncoordinated activities between a number of bodies that affect developments in the area and there is a lack of harmonization among regulations. Although many rural areas have experienced depopulation, some areas, such as those affected by the war, show trends of a population return. In contrast to the period 1990 - 1997, progress has been made in the construction of infrastructure, which has contributed to better regional connectivity; and, in recent years, in combating illegal construction. Despite these positive shifts, however, available data indicate that the objectives for uniform spatial development in Croatia are still not being achieved.

• ENERGY AND INDUSTRY - DRIVING FORCES FOR DEVELOPMENT BECOMING MORE AND MORE ENVIRONMENTALLY AWARE

Although the production of primary energy is increasing, it has still not reached the 1990 level. Since 1992, when the total consumption of energy dropped to a minimum, the consumption of energy as one of the basic indicators of growth has maintained an upward trend at an average annual rate of 3.1 per cent, which corresponds to the GDP growth. Thus, it reached 405.6 PJ in 2004. As a result, CO_2 emissions are increasing, too. Since 2000, the average annual rate of increase in emissions has been twice as high as that of energy consumption. More recently, SO_2 emissions have stabilized at approximately 35 per cent of 1990 emissions, which is a result of the implementation of systematic protection measures, such as the introduction of an environmental management system (EMS) in compliance with ISO 14001.

Increased domestic production of natural gas and accelerated development of the gas grid system in the Republic of Croatia will facilitate the wider use of gas in households and, especially, in electricity generation. This can be expected to cause a drop in the rate of increase of CO_2 emissions. Despite the construction of first wind power plants, the possibility of using renewable energy sources is still insufficiently recognized, but a legislative framework aimed at encouraging the use of renewable energy sources is in the process of adoption.

The energy and industrial sectors have a significant impact on the environment. One globally recognized indicator of the adverse effect of those sectors on the environment is the emission of greenhouse gases, especially CO_2. If the current trend of economic growth continues, Croatia will soon reach the emission level allocated to it by the Kyoto Protocol for the period 2008 - 2012.

The transitional process and wartime operations in the early 1990s caused a sharp decrease in industrial production. Since 1997, there has been a constant upward trend. In 2002, the 1991 level of industrial production was reached. The increase in industrial activity was accompanied by an increase in air emissions, especially those of CO_2 and SO_2, but there has been a noticeable improvement in the rational use of electricity and water. However, the decrease in industrial energy consumption was replaced by an increase in household energy consumption and by consumption in the service sector. Since almost 30 per cent of industrial wastewater is discharged directly into a receiver

(a natural receiver and the public sewage system) unpurified water is a cause of major concern. The increased number of businesses certified according to ISO 14001 is encouraging and there have also been noticeable shifts in the application of cleaner production projects, which contributes to industrial efficiency in general.

Visual landscape pollution might potentially be another form of environmental pollution. Industry and mineral excavation such as quarrying, especially in their extreme forms, represent irretrievable landscape degradation due to the absence of revitalization of the exploitation sites. In this segment, considering the current state, implementation of measures laid down by the National Environmental Action Plan must be encouraged because the results achieved so far are not satisfactory.

• AGRICULTURE, FORESTRY, FISHERIES AND AQUACULTURE – ECONOMIC INTERESTS AHEAD OF THE ENVIRONMENT. HOW CAN THEY BE RECONCILED?

The impact of agriculture on the environment is reflected in the pollution of the soil, waters and the sea. It also contributes to global warming through greenhouse gas emissions. Globally speaking, the growing need for food production has caused the expansion of agricultural land, the intensification of production, increased use of plant protection agents and diverse manipulations aimed at higher crop yields and resistance, all of which inevitably result in severe environmental pressures. In contrast to the global trend, the amount of agricultural land in Croatia (3.14 million hectares) and its main planned land use have not substantially changed compared to the pre-war period. Unfavourable economic conditions, the presence of landmines and the depopulation of rural areas are the reasons for the run-down state of a portion of agricultural land. Croatia has initiated activities to promote and develop of ecological production. In 2005, 0.2 percent of agricultural land was used for some kind of ecological production. This is 600 times greater than in the year 2000. The County of Primorje-Gorski kotar (54.6%) and the County of Osijek-Baranja (20.9%) have the greatest share of land in ecological production. Other regions, despite high potentials, are lagging behind. The consumption of mineral fertilizers has dropped considerably, which has a positive environmental effect. However, there are no reliable systematic data on the damage caused to soil by the use of plant protection agents. Fragmentation of farms, inadequate level of farmers' education and a shortage of funds are the basic reasons for the insufficient implementation of plant cultivation activities in a manner that would in the first instance focus on minimizing biological, chemical and physical degradation of the soil.

The important genetic diversity of Croatia's livestock is reflected in a large number of native domestic breeds adapted to local conditions and characterized by their own genetic and phenotypic identifiability. During the Homeland War the number of livestock dropped considerably and still lies below the 1990 level. Only the number of sheep is almost equal to the pre-war number. A noticeable increase in ecological livestock breeding is mostly due to higher financial incentives.

Forests are a natural asset of special importance with both an economic and irreplaceable ecological

value in regulating climate, in mitigating the effects of greenhouse gases, in protecting water and soil quality, and against erosion, and in preserving biodiversity. In the Republic of Croatia forests cover 2.1 million hectares, or 37 percent of the total mainland area. This is an invaluable natural wealth. In our forests some 260 native woody plants may be found. Plant diseases, fires, air pollution (mostly transboundary), and the construction of large highways or other developments pose a threat to these forests. The pest management programme is well controlled and carried out by standard biological and biotechnological measures. Over the last ten years forest fires have proved to be a major threat to forests, destroying about 196,000 hectares of woodland, particularly in the coastal region. The project "Restoration and Protection of Coastal Forests" includes activities of biological reproduction, afforestation, construction of fire prevention corridors, and the purchase of firefighting equipment – special-purpose aircraft, fire engines and other equipment. The construction of highways and other roads and of sports and recreational zones, which require additional cutting, causes the degradation of a highly vulnerable ecosystem and unquestionably inflicts damage on forests. The consequences of this activity will be felt in only a few years. The Forests Act and other regulations encourage the conservation of biodiversity and assign priority to the ecological function of forests over the revenue generated by cutting.

The share of commercial fishing in Croatia's GDP is less than one percent, which is by no means satisfactory given the country's Adriatic orientation and the fact that fishing is a traditional branch of the economy. Nevertheless, the sea fish catch continues to rise, primarily due to more advanced fishing techniques and better recordkeeping. In 2004, the total catch amounted to 31,900 tonnes, with the highest share of small oily fish whose catch is six times that of the white fish. The size of the fishing fleet is also increasing, but still consists mostly of small vessels. The pressure of sea fishing is greatest in channel areas, and has resulted in a 40 percent drop of the biomass index of the major groups of bottom-dwelling fish species in Croatia's territorial waters. Targeted scientific research points to the declining biostocks of the Adriatic Sea and to the overfishing of certain species. At present, sea fishing takes place in internal and external sea fishing grounds of the Republic of Croatia that include the territorial waters of the Republic of Croatia and the protected ecological and fishing belt (ZERP). Although this belt has been declared, it has still not been applied to EU member countries and therefore has shown no results so far.

The mariculture primarily includes the farming of Atlantic tuna, sea bass and the gilthead. Since this is a relatively new business activity in the country, the volumes continue to rise. The production of tuna harvested in the period 1999 - 2004 increased by more than fivefold, totalling 3,777 tonnes in 2004. Freshwater fishing is confined to sport fishing, with only a small number of traditional fishermen fishing along areas of the rivers Sava and Danube. The production of freshwater aquaculture is constantly falling. In 2003, the area of fish farms was only the half of that in 1995. The fish most often bred are carp (so-called warm water fish-farming) and the California trout (so-called coldwater fish-farming) with a total production of 5,600 tonnes in 2004. The implementation of measures laid down by the National Environmental Action Plan may be considered only partly successful.

• TRANSPORT – A CHALLENGE FOR PLANNED OBJECTIVES

Transport is a source of considerable environmental pressures due to air emissions of harmful substances, increased noise, negative impact on natural habitats and possible accidents during transportation. There has been a strong growth in the number of vehicles, road transport has increased and the use of public transport has decreased. Unfortunately, rail and maritime transport as cleaner, safer methods of conveying passengers and goods are only seasonally important and, generally speaking, are stagnating or show a downward trend. Although air emissions of lead have substantially decreased primarily due to the ever-increasing use of lead-free petrol, the consumption of diesel fuels has increased, consequently increasing the emission of particulate matter and sulphur dioxide. Intensive construction of large highways provided a better regional and intercounty connectedness, but those developments tended to reduce, intersect and sometimes completely destroy natural habitats. A large portion of hazardous substances, primarily oil, oil derivatives and gas, is transported by sea (40%) and by mainland pipelines (38%). No accidents or damages to tankers used for the transport of hazardous substances have been reported, but the consequences of such events would undoubtedly be catastrophic. There were minor oil pipeline leaks, whose consequences were successfully remedied, but these accidents point to the need for a more efficient pipeline control system. An increasing volume (14%) of hazardous substances is transported by road, which led to an increase in the number of accidents – traffic accidents that resulted in hazardous substance spills in the environment. The consequences of those accidents were remedied without inflicting major damage to the environment.

As a sector that exerts considerable environmental pressure, transport is insufficiently addressed in environmental programmes at the county level. The same applies to towns, whose transport studies predominantly deal with the organizational aspects of transport, fully neglecting the issue of environmental pressures.

In view of the above, the measures recommended by the National Environmental Action Plan (transport development based on a combined transport system and encouraging a higher share for public transport) may be said to have failed in achieving the results desired.

• TOURISM – INCREASING ENVIRONMENTAL PRESSURES. CAN CROATIA REMAIN "THE MEDITERRANEAN AS IT ONCE WAS"?

Tourism is becoming the fastest growing industry in the world. In the Republic of Croatia it represents the main strategic determinant of development. Despite that, the planned systematic evaluation and protection of all tourist potentials and resources has not taken place. The disorganized growth of the tourist industry, the construction of new accommodation facilities without corresponding infrastructure and the construction of new marinas and roads are the underlying causes of increasingly strong pressures on the environment. This uncontrolled process has recently been described by a new term – "coastal concreting". It has been only partly restrained by the adoption of the Regulation on Area Development and Protection of the Protected Coastal Zone of the

Sea in 2004. By 1960, about 120-150 km of the coast were urbanized, built up or developed. Since then, there has been continuous construction of all types of buildings. By 2000, the result was an increase in towns, settlements and other urbanized areas to 837 km of the coast, almost 15 percent of its total length. In forty-year land-grab to construct tourist facilities five times as much coast has been occupied as by all former generations altogether. Another serious challenge for environmental protection in tourism is the current level of public utility services, especially the water discharge system. However, several projects are underway with the aim to improve the current state. Despite its unquestionably positive economic effects, yachting has substantially burdened the marine environment. This relates mainly to the unresolved issue of the disposal of waste from vessels, which directly depends on the ecological awareness of boaters, and the effects of the use of various chemicals and harmful marine coatings that are flushed and discharged into the sea. The number of vessels itself, and the increased consumption of petrol or diesel fuel, burdens the marine environment, too. In 2005, the number of berths in marinas and ports was almost by 50 percent higher than in 1997, but no data on the effects of the coatings mentioned and other marine pollution have been systematically collected.

The majority of tourism-related pressures is concentrated in the coastal and littoral area over a very short span of time, the summer season, which puts great stress on all environmental components. Recently, a marked growth in continental tourism has been recorded. Almost all counties of the country's interior are planning some form of tourism, regardless of the preconditions required. The areas of karst, rivers, lakes and protected nature are becoming especially vulnerable.

Despite everything, the marine environment load does not exceed that of the pre-war period, which has allowed the Croatian coast to maintain its status as one of the best preserved parts of the Mediterranean. Now we are faced with the responsibility of keeping that way.

• CHEMICALS – AN OVERALL SPREAD

In the Republic of Croatia there are no data on systematic monitoring of the volume and types of chemicals and chemical products available on the Croatian market, while data on the production and consumption of chemicals vary widely depending on the source of data. Diverse chemicals may be found in all daily-use products: food, furniture, cosmetic and sanitary products, detergents, medicines, paints, plant protection agents, etc. Their number is constantly increasing, clearly evident in the increase in the number of corresponding permits. An inevitable problem is the presence of the so-called persistent organic pollutants (POPs), a common name for compounds that are resistant to environmental degradation through photolytic, biological and chemical processes. Another problem is that they accumulate in living organisms and are capable of long-range transport. The issue of POPs is covered by the Stockholm Convention (2001) signed by the Republic of Croatia, but still not ratified. The measures under the National Environmental Action Plan with respect to the legislation on chemicals have been partly implemented. The Chemicals Act adopted late in 2005 has been brought into line with relevant EU regulations and the National Implementation Plan for the Stockholm Convention has been adopted, too. However, for major positive

shifts it is necessary to await the results of the implementation of the Chemicals Act.

• WASTE – RESOLUTION OF PROBLEM ISSUES HAS STARTED

In the period 1997 - 2004 minor shifts were made in the development of the waste management system, followed by the start of intensive activities focused on the resolution of accumulated problems. One serious problem encountered in that period was the lack of key strategic documents required for planning and implementation of systematic activities at all levels. Due to a constantly low level of regulation implementation, landfill adaptation deadlines kept being extended, but even then the landfills were not remedied. At the same time, not enough has been done to prepare the technical regulations that would facilitate, improve and standardize activities relating to projects underway, especially in regard to remediation projects of existing landfills.

Since 2005, changes have been made in the preparation of strategic documents, such as the Waste Management Strategy of the Republic of Croatia adopted in 2005. It was followed by the formulation of the Waste Management Plan of the Republic of Croatia, by harmonization with EU legislation and, in particular, by the adoption of the new Wastes Act and subordinate legislation governing in detail certain issues, and by the introduction of the concept of manufacturer's liability.

The collection of newly-introduced charges for environmental load due to waste started in 2004. In December 2005, charges for the disposal of packaging waste, or rather charges for the use of disposables, were introduced to encourage the use of reusables.

Waste prevention and minimization have been recognized as priority objectives, but their implementation lacks a systematic approach and systematic education. Mention should be made of the activities carried out by the Croatian Cleaner Production Centre that initiated and implemented cleaner production projects in the industrial sector. Although potentially an excellent instrument of prevention, the Waste Stock Exchange is underused. The evaluation of the state is further aggravated by a lack of realistic data on waste types and volumes.

Municipal waste volumes are constantly increasing. In 2004, the amount of municipal waste generated was estimated at 1.31 million tonnes, or about 295 kg per inhabitant annually, or 0.81 kg daily. The percentage of population covered by organized collection of municipal waste is rising. The amount of separately collected waste from municipal waste in the reporting period was decreasing, after which measures were introduced to encourage separate collection of individual types of waste with good results. The fees for waste transport services are mostly calculated according to the floor space (in over 90 percent of cases) rather than the volume of waste generated. Almost the entire amount of municipal waste collected is deposited in landfills. The percentage of municipal waste covered by organized collection and disposal is 79 percent (1,037,500 tonnes), by unorganized collection 18 per cent, by separate collection 2 per cent and by composting 1%.

The volume of packaging waste is also increasing, amounting to 250,000 tonnes in 2004. The share of

plastic packaging waste rose with particular speed. The adoption of the Ordinance on Packaging and Packaging Waste in 2005 was aimed at encouraging the nationwide use and development of waste recovery facilities. A certain amount of packaging waste is being treated, although this amount might be much higher considering the installed capacities of waste treatment facilities. The number of end-of-life vehicles rose enormously, totalling 65,650 in 2003 and leading to an increased number of waste tires.

In the field of industrial, and particularly hazardous, waste the state worsened in 2002 due to the shutdown of the Croatia's only hazardous waste incinerator – the PUTO mobile installation. With the exception of co-incineration of some oil in certain facilities, there is at present no adequate hazardous waste management facility in the Republic of Croatia. A major portion of hazardous waste is therefore exported. In 2004, 12,805 tonnes of hazardous waste were exported; the remaining amounts were temporarily stored at the point of generation.

In the period 1997 - 2004 no serious waste management facility was put into operation. Waste disposal procedures chiefly take the form of deposits in landfills, of which only a few meet the standards laid down and have the required permits. The Landfill Cadastre lists 283 registered landfills, of which 187 active landfills with the required permits operate on the basis of some other document, or with a licence issued by a municipality. The level of equipment and protection measures applied in the landfills is generally poor, and the environmental impact of waste disposal is monitored only on a small number of landfills, about 41 of them in total. Remediation has been carried out on a small number of landfills. Site qualification procedures for several county (regional) waste management centres, including certain initiatives mostly of local importance, are underway.

The Environmental Protection and Energy Efficiency Fund, which in the period 2004 - 2005 entered into contracts to co-finance the remediation of 165 landfills at a value of 162.7 million kunas, raised great expectations. The results of this action should become evident in the next reporting period.

• DO ANTHROPOGENIC ENVIRONMENTAL PRESSURES IN THE REPUBLIC OF CROATIA EXCEED THE CRITICAL LIMIT?

Taken as a whole, human-induced pressures on the environment in Croatia do not exceed critical limits. The post-war period of reduced economic activity, although negative from the aspect of the economic development of the country, favoured the environment and reduced environmental pressures in the country that were not high compared to European averages anyway. Although environmental pressures recently have followed the upward trend of economic growth, from the aspect of environmental impacts the state is still not alarming, as long as future growth is brought into line with environmental protection needs, and is planned and implemented in accordance with the concept of sustainable development.

2.2. ENVIRONMENTAL COMPONENTS

• CLEANER AIR

The state of air quality in the Republic of Croatia is much more favourable than in 1999. Generally speaking, the emissions of pollutants have decreased, partly due to the shutdown of major emission sources that existed in the 1990s, and partly as a result of measures taken to comply with international air quality conventions and protocols. The recent Air Protection Act sets conditions for further approximation and application of EU provisions, and other sectoral regulations and programmes are expected to have a positive effect on air quality if their implementation is ensured.

In 2000, the use of low-sulphur fuels in thermal plants resulted in the largest improvement of air quality. In 2004, human-induced SO_2 emissions dropped by more than 25 percent compared to 1997. This emission level is 48 percent below the emission allowance (117 Kt) allocated by the Protocol on the Further Reduction of SO_2 Emissions and 14 percent below the emission allowance (70 Kt) under the Protocol to Abate Acidification, Eutrophication and Ground-level Ozone. Although technologically more advanced vehicles using high quality fuels caused a part of the reduction in emissions, the rise in passenger transport did not make it possible to reduce total transport-related emissions. The use of lead-free petrol helped reduce air emissions of lead by 91.5 percent compared to 1997, but at the same time the constant rise in the number of vehicles caused a slight increase in NOx emissions.

Air quality measurements and modelling showed the air in rural parts of Croatia to be clean and the air in inhabited areas mostly to comply with current regulations. The permanent control of pollutant emissions from industry, the control of fuel quality, connection of settlements and towns to the gas grid and the extended coverage of citizens with district heating increased the percentage of towns and settlements in which the air is clean or only slightly polluted.

A local network for air quality measurements has been introduced in ten counties containing almost 68 percent of Croatia's population. In the period 1997 - 2004 excessively polluted air (category III) was recorded in 15 percent of towns and settlements, of parts thereof; moderately polluted (category II) in 22 per cent of towns and settlements; and clean or slightly polluted (category I) in 63 per cent of towns and settlements. In most cases the air was found to be excessively or moderately polluted by total deposited matter, sulphur dioxide, smoke and nitrogen dioxide. In Rijeka, Sisak and Kutina the air is excessively polluted by specific pollutants, such as hydrogen sulfide and/or ammonia. Due to remediation programmes in the last few years and other measures, improvements were registered in Rijeka and Kutina. The newly-established National Network for Permanent Air Quality Monitoring will in time substantially improve air quality monitoring and make it possible to measure and control air quality protection and improvement at the national level.

The load of hazardous substances from precipitation has also decreased. The highest deposits of sulphur and nitrogen oxides that may be attributed to anthropogenic sources have been recorded in the areas of Rijeka, Gorski kotar and Lika. The balance of transboundary transmission

of air pollutants shows the import to Croatia from neighbouring countries (Italy, Slovenia, Hungary, Serbia and Montenegro and B&H) to exceed the export. The transmission of pollution by sulphur compounds is following a downward, while that of nitrogen compounds a slow upward trend.

Marked progress was made in the reduction and phasing-out of the consumption of ozone depleting substances (ODS). Measures for a gradual reduction and phasing-out of ODS consumption are being successfully implemented and have resulted in a 52.6 per cent reduction in the total ODS consumption compared to 1997. Numerous projects were aimed at the introduction of the control of import, transit and consumption of ozone-depleting substances, and especially of the application and use of substitute substances that do not deplete the ozone layer.

• CLIMATE CHANGES BECOMING NOTICEABLE

Global climate changes are reflected in the mean annual temperature increase on one hand and, at the same time, in decreasing precipitation on the other hand. In the Republic of Croatia the years at the turn of the century were the warmest on record while in the same period the annual amount of precipitation dropped. Long periods of drought also favour forest fires. Consequently, the largest number of forest fires – a total of 590 – was recorded in the Summer of 2000. The incidence of extraordinary weather conditions is rising.

The change in greenhouse gas emissions is congruent with the changes in the rate of GDP growth. The most polluting sectors are energy and industry. In 2004, the energy sector contributed to 74.9 percent of greenhouse gas emissions. Agriculture contributed 12.1 percent and industrial processes contributed 10.8 percent. Despite the project of providing a supply of gas to new consumers throughout the country, the numerous cost-effective measures to upgrade energy efficiency remain inadequately applied both in the generation and consumption of energy. Considering the current level of emissions, the Croatia is facing a threat of non-compliance with its commitments under the Kyoto Protocol.

• INCREASING IMPORTANCE OF THE PROTECTION OF WATER RESOURCES AND THE SEA

The Republic of Croatia is naturally endowed with reserves of water sufficient for its development. But, there is a problem in the geographic and time-related unevenness in accessibility. There is a marked shortage of water on the islands and in the coastal area during the Summer, when water demand becomes several times higher due to the arrival of a large number of tourists. Groundwater is especially important because it is the main source of the potable water supply – some 90 per cent of potable water originates from groundwater. Therefore, efforts have been made to ensure more consistent implementation of water protection measures in the inflow area of water pumping stations. In the same period surface water quality has not changed substantially, although there are certain deviations from the water category required. These deviations are most often due to the discharge of unpurified waste waters.

Seventy-six percent of the population has a public water supply. The rest of the population uses

uncontrolled drinking water (individual wells etc.). Forty-three percent of the population is connected to sewage networks, mostly in larger towns. Despite considerable investment in water protection and the doubled volume of wastewater that has been purified, the efficiency of pollutant elimination is not satisfactory. About 25 percent of municipal wastewater undergoes purification, but only 14 percent of the pollution is eliminated from them. In the Republic of Croatia 83 municipal wastewater treatment plants have been constructed, of which only 34 have a second stage of wastewater treatment, while not a single plant has a third stage. The use of alternative plants for municipal wastewater treatment has only just begun. The major problem of water protection lies in the discrepancy between the water supply level (76 percent), the degree of connectivity to sewage networks (43 percent) and wastewater purification (25 per cent).

In comparison to the pre-war period the industrial wastewater load has decreased, which is primarily due to the decline in industrial production. Of industrial wastewaters only 20 percent is purified and discharged directly into the natural receiver.

By designating a Protected Ecological and Fishing Belt (ZERP), the maritime area within the jurisdiction of the Republic of Croatia has been increased by 25,207 km2. Thus, the surface of the marine and the mainland areas over which the Republic of Croatia has sovereign power have been almost equalized. The large, craggy coastal and maritime areas are extremely important to Croatia. Therefore, it has exerted continuous efforts to ensure their sustainable use and control. The results of monitoring the state in the reporting period indicate that the quality of the Croatian part of the Adriatic Sea ranges from high (Class 1) to satisfactory. An elevated degree of eutrophication caused by an excess of nutrients has been recorded in the bays of Šibenik, Kaštela and Bakar only, where seawater quality in Category 2 and sometimes in Category 3 has been recorded. The lowest quality Category 4 was not found at all. The sanitary fitness of seawater on beaches and sea water quality in fish-farms is satisfactory. The load of hazardous and harmful substances in the sea ranges from values characteristic of low to those characteristic of moderately polluted areas. Harmful and hazardous algal blooms periodically occur in certain areas, but to a much lesser extent than in the past twenty years. The distribution of invasive foreign species such as Caulerpa algae is growing. Other pressures on seawater quality such as the discharge of unpurified or insufficiently purified municipal and industrial wastewaters are on the increase. The load of nitrogen compounds is slightly increasing, but that of phosphates is decreasing. The intensity of marine transport and transshipment of hazardous and harmful substances through Croatian ports is maintaining an upward trend (25 percent). Despite the increased volume of transport, the incidence of accidental marine pollution is not particularly high. However, the usurpation of the marine resources that poses a threat to coastal marine communities of organisms is growing.

• SOIL – A NEGLECTED RESOURCE

Soil is the most neglected resource, which is partly a consequence of the non-existence of an integral soil protection policy in the Republic of Croatia. The use and quality of soil underwent changes due to intensive industrial and agricultural activity, inadequate methods of waste disposal, mining and mineral quarrying, military activity

or various accidents. According to the available data, 1,056 potentially polluted sites were recorded, of which pollution was confirmed for 69 sites. The number of potentially polluted sites is very likely higher. Therefore, it is important for the Republic of Croatia to collect accurate data. There is no systematic monitoring of soil and water pollution resulting from agricultural production.

Acidification by acid rains and the intensive use of mineral and organic fertilizers, including those of geogenic origin, may be found in about 29 percent of all soils in the country. The trend of soil acidification by acid rains is slowing down, primarily due to the decrease in air emissions throughout Europe. Salinization of soils in the Neretva Valley is growing sharply as a result of extensive land improvement and the construction of hydropower plants that have caused the changes in the hydrological regime of rivers. Large amounts of salt from deeper alluvial strata have penetrated into the surface layers of arable land. Increased salinization was also recorded in the area of the Vransko Lake and in the lower Mirna and Raša Rivers in Istria. The problem of soil alkalification is present in a limited area of 410 hectares of eastern Slavonia and Baranja. Although salinization and alkalification of soils represent the most critical forms of soil degradation, and demand systematic monitoring and combating by adequate measures, it should be noted that this refers to sharply two per cent of the land area of the Republic of Croatia. In addition, 48 percent of Croatia's agricultural land is exposed to erosion, which is a consequence of natural factors (type of soil, climate, relief, vegetation) and inappropriate agrotechnical practices. An important cause of soil erosion in coastal catchment areas is forest fires. In the area of continental Croatia, especially around Osijek, frequent shortages of useful water in the soil were recorded, indicating a pedological drought.

The adoption of adequate legislation has been defined as one of basic preconditions for the achievement of objectives to mitigate the above-mentioned negative trends, but the progress has been slow. For the time being, only individual and uncoordinated monitoring of the state of soil is being conducted. This cannot meet the needs of a systematic monitoring of the state and changes in soil. Only the determination of a systematic monitoring and control will facilitate the establishment of a soil information system and provide all of the data necessary for an efficient and long-term protection of this resource.

• BIODIVERSITY – WEALTH INSUFFICIENTLY EXPLORED

The diversity and wealth of ecosystems and habitats in Croatia are among the largest in Europe. Since 2000, data have been intensively collected and processed in order to compile a list of the components of biological types and systems, determine their distribution and threats, and implement adequate protection measures.

On the other hand, maintaining biodiversity is threatened by anthropogenic pressures, primarily from infrastructure construction and the expansion of built-up areas. The disappearance of habitats is one of the major threats to species. Since no monitoring of the status of habitats is in place, it can only be mentioned that there is general degradation and a disappearance of small habitats, such as moors, sands, fens, etc., caused by overgrowth.

A knowledge of the present status is necessary in order to monitor the changes and as a pre-condition for the adoption of adequate and timely protection measures. The inventorying of flora, fauna and important landscapes is underway, but this is a long-term task requiring the involvement of a number of institutions and considerable financial resources.

A positive shift has been affected in the number and size of protected nature areas – the land area currently under protection covers 9.06 per cent of Croatia's mainland. However, the protection provided to marine areas does not follow this trend, which results in a disproportion between specially protected mainland and marine areas. Since no new nature area has been protected since 2003, the question arises whether the nature protection trend is stagnating, or if it this is just a stage in the preparation of documentation for additional areas.

In the reporting period no plan for the management of individual protected areas was adopted. Although the preparation of some of plans did begin, it was solely as part of internationally-funded projects. Physical plans for five national parks have been adopted and plans for other national parks, including nature parks, are in preparation.

The incorporation of biodiversity conservation in the documents of certain sectors, such as forestry, agriculture, and water management, has only just started. Therefore, systematic intersectoral dialogue and cooperation still have not been established in full. With the launch of the ecological network concept in 2005 that involves all users of areas in ecologically important zones, the improvement of such cooperation has become an environmental priority.

• A NEED FOR A COMPREHENSIVE ASSESSMENT OF ENVIRONMENTAL IMPACTS ON HUMAN HEALTH

As stipulated by the Constitution of the Republic of Croatia, a healthy environment is understood and treated as a fundamental pre-condition for the quality of life and the protection of human health. Available data do not suggest that any particular factor has had significant negative impact on health, except for specific cases in the working environment. The average life expectancy in the Republic of Croatia is 74.4 years. The percentage of the population that is connected to the public water supply system is high and the percentage of sub-standard drinking water samples is decreasing – constantly below 10 percent since 1997. Epidemics caused by drinking water-borne agents are rare, occurring primarily in smaller water supply systems. Recreational water of the highest quality is found on beaches (about two percent of samples do not meet the standards) and of the lowest quality water in swimming pools (21 percent of samples do not meet the standards). Air quality in urban areas has generally improved compared to 1990. Noise is more often present in the working than in the living environment. Ultraviolet radiation is constantly increasing at a rate of eight percent annually, which may correlate with the increased incidence of malignant skin cancer of some 8.7 per cent yearly. Food safety in production and in transportation in Croatia is continuously monitored. Bacterial infections caused by Salmonella, E-coli or Trichinella occur only occasionally.

Occupational diseases are monitored, but the impact of the working environment on human health

may only be monitored when the hazardousness of a workplace is the basic cause of a disability. The majority of the diseases registered may be attributed to the harmful effects of vibration and noise. Many others are caused by mineral dust, e.g. asbestosis and skin diseases. However, no systematic research into the reach and impact of such pollution on human health has been carried out. Allergies, mostly the so-called pollen allergies, represent a large segment of the impact of nature on human health. It should be noted that concentrations of pollen in the air have been measured and results made public in Zagreb since 2002. This provides information to and assists in self-prevention for people sensitive to certain pollen types.

2.3. GENERAL ENVIRONMENTAL ISSUES

Today, any further development of society is possible in the long run only if it is based on sustainability. Generally accepted sustainable development principles include a coordinated, permanent concern for the environment. Individual environmental components cannot be considered merely problems of individual countries or regions because, just like the air, rivers and the sea, they are permanently in motion, and are not limited by national boundaries. Nevertheless, the concern for the environment and implementation of sustainable development principles call for active involvement of each individual country to enhance long-term global environmental performance.

• HOW IS ENVIRONMENTAL PROTECTION ORGANIZED?

The Croatian Parliament, the Government of the Republic of Croatia, and the representative and executive bodies of local and district governments are responsible for the efficient environmental protection of the country. The Ministry of Environmental Protection, Physical Planning and Construction is the central government body in charge of environmental policies based on the sustainable development principles. In addition to this Ministry, other central government bodies also carry out administrative and other activities related to the protection of individual environmental components. These bodies include newly established, specialized institutions, such as the Croatian Environmental Agency and the Environmental Protection and Energy Efficiency Fund.

State administrative offices have been established with the aim to conduct governmental affairs in the districts and regional governmental units. At the local level the municipality, the town and the county define, organize, finance and improve environmental activities of regional or local importance. Environmental protection in a municipal, district or regional government unit includes providing conditions for implementing environmental programmes, for preparing and carrying out remediation when made obligatory to the relevant unit, for ensuring state of the environment monitoring and for providing conditions for maintaining the Environmental Pollution Cadastre and records of the state of the environment, environmental protection measures and public information methods.

An important role is also played by professional and business associations, scientific and research institutions, citizens' associations and non-governmental organizations. In recent years there has been a marked upward trend in the number of institutions and organizations, both governmental and non-governmental, because of growing public awareness of the need to preserve the environment.

• IMPLEMENTATION OF ENVIRONMENTAL POLICY – HOW CONSISTENT ARE WE?

The preparation and adoption of the National Environmental Strategy and the National Environmental Action Plan marked a major qualitative shift in the environmental policy of the Republic of Croatia. The analysis of the achievement of objectives and the implementation of measures mandated by the National Plan has shown different results by individual sectors and environmental components. The underlying causes for this are the relatively short period of time since their adoption, a large number of fragmented measures foreseen by the National Environmental Action Plan for each individual sector, and a partial lack of coordination between the National Environmental Strategy and the National Environmental Action Plan.

The analysis indicated that current sectoral policies, when acting separately, are not capable of ensuring the desired level of environmental protection. The accomplishment of this objective requires a better integration of environment into other policy segments. For many problems there is a corresponding legislative and institutional framework in place, but both a consistent application of measures and adequate control are missing. The number of environmental inspectors is insufficient for effective control. Moreover, the level of cooperation and coordination between various inspection bodies cannot ensure the required efficiency of control. Another obstacle to efficient inspection operations is legislative deficiencies in defining their obligations, authorities and powers.

The non-existence of a harmonized methodology for data collection and processing, the absence of national standards in compliance with those of the EU, the lack of coordination among individual subordinate legislative acts, financial constraints and missing funding mechanisms for some important measures for implementing environmental policies may also be considered as major obstacles capable of slowing down or preventing the achievement of this general objective.

• IMPLEMENTATION OF ENVIRONMENTAL MEASURES AND OBLIGATIONS AT THE LOCAL AND REGIONAL LEVEL

The analysis of implementation of environmental measures at the local and regional level in the reporting period has not produced satisfactory results. There are many arguments for such a statement: from the simplest, - that the obligation to prepare an environmental protection programme for only 12 counties, but whose conformity with the National Environmental Strategy remains questionable - to the more complex and financially more demanding, such as waste disposal. In many parts of the country nothing has been done

for many years to solve the major environmental problem, i.e. municipal waste disposal. This is an obligation of local and regional government. Since local and regional governments have continually failed to meet the legally prescribed deadlines for the fulfilment of individual obligations, those deadlines were consequently changed and extended at the government level. This resulted in a comparatively low level of implementation for many regulations. This status is a consequence of a number of factors: on one hand, a shortage of adequate financial resources required for environmental protection and a shortage of skilled staff at all government levels; and, on the other hand, an inadequately regulated relationship between government agencies and the regional and local governments to ensure the meeting of legal commitments. In 2005, some positive shifts were made in preparing and implementing the required environmental documents and in the operational resolution of problems of waste -- primarily through the cooperation of the national government, local and regional authorities and the Environmental Protection and Energy Efficiency Fund.

• IS ENOUGH MONEY INVESTED IN ENVIRONMENTAL PROTECTION?

Capital investment in environmental protection continues to rise. This increase began in 1999 and reached 0.64 per cent of the GDP, i.e. 1.46 million kunas in 2005, with indications of a further rise. In 2004, only 0.46 per cent of budgetary resources were allocated for environmental protection, excluding monies earmarked for wages and system administration. However, this level of investment, even if we assume that not all environmental investments were statistically recorded and processed, cannot suffice for the achievement of environmental objectives. To meet EU standards, those amounts will have to be increased several fold. Measures to encourage investment were either missing or insufficiently applied, e.g. the absence of tax incentives for those investing in environmental protection.

Pricing policy in the public utility services is gradually turning into a system completely reliant on the polluter pays and the user pays principle, which is expected to result in a wider construction and use of public utility infrastructure. Experience shows that the price of the service, in combination with other factors, may cause unnecessary adverse effects on the environment, such as a low percentage of the population connected to the public sewage system.

A major breakthrough in securing the financing necessary for environmental protection was achieved by establishing the Environmental Protection and Energy Efficiency Fund in 2003. Money for the Fund is collected from new environmental charges and secured by the adoption of legislative provisions mandating a series of new environmental charges, including charges for the use of motor vehicles, for environmental load by waste (particularly relating to hazardous waste generation), for the disposal of industrial and municipal waste, for packaging waste and charges relating to SO_2 and NO_2 emissions.

3. Conclusions from the State of the Environment Report

3.1. EVALUATION OF THE STATE

• LEGISLATIVE AND INSTITUTIONAL STRENGTHENING FOR ENVIRONMENTAL PROTECTION

After the adoption of first regulations in the first half of the 1990s, a major shift was made in an institutional and legislative sense. Since 1997, a number of new laws, regulations and ordinances have been passed on the protection of individual environmental areas or sectors whose activities have an impact on the quality of environmental components. Many of them have now been modified, revised or reformulated to bring them into line with corresponding EU legislation.

In 2002, the Republic of Croatia adopted its main strategic document on environmental protection - the National Environmental Strategy - and the implementation document, the National Environmental Action Plan. Despite the results achieved, certain important areas are still not governed by regulations. At present, the preparation of a new Environmental Protection Act represents a particular challenge.

This reporting period was accompanied by a strengthening of institutional capacities in environmental protection. The process began in 2000 by establishing the Ministry of Environmental Protection and Physical Planning from the State Directorate for Environmental Protection as a reflection of the improvement in both the public and political attitudes toward environmental protection. With the restructuring of government in late 2003 nature protection became the responsibility of the Ministry of Culture and a strong Ministry of Environmental Protection, Physical Planning and Construction was established. The Croatian Environmental Agency was founded in late 2002 as a central body for the collection and processing of environmental information and cooperation with relevant EU institutions. The Environmental Protection and Energy Efficiency Fund was established in 2003 to provide funding for environmental protection and for internalization of a portion of environmental pollution costs.

In the reporting period there has been an increase in funds provided from the budget of the Republic of Croatia for environmental protection and for investments in environmental protection in general. The EU accession process has served a catalyst, giving the environment the importance that it deserves and accelerating numerous activities, especially those relating to approximation of the national legislation with the EU acquis communitaire and the harmonization of Croatian and European sectoral policies.

- CHANGE IN THE OVERALL SOCIAL AND BUSINESS CLIMATE TOWARDS ENVIRONMENTAL PROTECTION AND CONSERVATION ISSUES – PUBLIC, NON-GOVERNMENTAL ORGANIZATIONS, EDUCATION, SCIENCE, ECONOMY

Public sensitivity and concern about environmental issues are reflected in the rise in the number of non-governmental organizations dealing with environmental issues, the increased number of environmental projects and programmes launched by various associations and organizations, the increasingly frequent presence of environmental topics in the daily press or other mass media, and in the increased number of questions addressed to responsible bodies. The EU accession process has put additional pressure on all parties involved in environmental issues, especially on responsible institutions in terms of obtaining the necessary public support to their activities.

Scientific and educational institutions have also recognized this concern. Despite an increasing number of so-called eco-schools in Croatia and the introduction of certain environmental topics into instruction in the primary and secondary schools, environmental protection remains inadequately represented in the educational system. The situation is better among scientific educational institutions, as shown by the increasing number of graduate and postgraduate environmental programmes and courses at several universities.

On the other hand, environmental protection has recently come to be recognized as a profitable business opportunity. This has resulted in an increased number of institutions, organizations and companies dealing with one of the environmental segments: education, analysis, monitoring of the state, consulting and operational implementation.

- SYSTEM OPERATION EFFICIENCY (GOAL ACCOMPLISHMENT LEVEL, CLARITY OF RESPONSIBILITIES, CONTROL AND SANCTIONS)

Taken as a whole, despite the success achieved in specific areas, Croatia is facing serious challenges in accomplishing its defined environmental objectives. The lack of transparency in obligations and responsibilities at the institutional and administrative level, the lack of legislative coordination and the shortage of funds continue to be basic obstacles to a more efficient implementation of the National Environmental Strategy and the National Environmental Action Plan. Fragmentation of responsibilities for individual environmental components among various government bodies does not contribute to efficient monitoring of the state of the environment and to the planning and implementation of environmental protection as a whole. Other obstacles to a more consistent implementation of goals are the missing or uncoordinated subordinate legislation, inefficient control of the implementation of regulations and inadequate sanctions. In spite of the fact that in a number of cases a corresponding legislative and institutional framework is in place, the guidelines have not been consistently followed.

The shortage of inspectors, the inadequate level of cooperation and coordination among various inspection bodies, and legislative deficiencies in defining the obligations and responsibilities of inspectors make control difficult. No qualitative shift has yet been made at the local and regional level in providing the human and financial resources that the increasing scope of environmental protection tasks demand.

• STATE OF INDIVIDUAL SECTORS AND ENVIRONMENTAL COMPONENTS

Given the specific quality of individual environmental components and unequal level of data quality, it is difficult to make a final overall evaluation of the state. Compared to the state described in the previous report, good progress has been made in certain segments, for example, in air protection, as reflected in the considerable reduction of SO_2 emissions; and in the establishment of a monitoring, control and information system. Other areas such as waste management are characterized by the number of activities designed to improve the state that started during 2004 and 2005, but whose actual positive achievements can only be evaluated in the next Report. On the other hand, systematic activities for the protection and improvement of the state of specific environmental components, such as soil, are either only at the beginning, or the aggravation of the state as a whole cannot be reliably evaluated.

On the basis of the data collected the state of the environment may be said to be not less than that in the previous reporting period, regardless of intensified pressures of all sectors in that period and the non-achievement of some objectives defined by the National Environmental Strategy and the National Environmental Action Plan.

The following are the key findings by each sector and environmental component covered by the present Report:

Space and Population

- The population continues to concentrate around urban centres; 25 percent of the population lives in the City of Zagreb and the County of Zagreb on 6.6 percent of the national territory.
- In the period 1990 - 2000 about 4,700 hectares of land underwent a change in use; changes in the area are less than those changes undertaken in other European countries.
- Negative population growth has not stopped; in the middle of 2003 it amounted to -2.9 per 1,000 inhabitants.
- Progress was made in the construction of transport infrastructure and in the improvement of regional connectivity compared to the period 1990 -1997; there are 6.37 km of roads per 1,000 inhabitants.
- In the reporting period intensive construction along the coast has not abated.

Energy

- In the period 2000 - 2004 total energy consumption increased at a rate of 3.1 percent annually.
- In the same period total energy consumption per capita in Croatia was 53.3 percent compared to the EU 15.
- Air emissions from stationary sources have decreased; compared to 1990 SO_2 emissions dropped by 35 percent.
- The use of gas in the generation of primary energy is rising; the construction of a further 386 km of transport gas pipelines is in progress.
- The use of energy from renewable sources (wind and biomass energy) is only beginning.

Industry

- The volume of industrial production is increasing; in the period 2000 - 2004 the average annual growth of industrial production was 4.7 percent.
- The highest growth was recorded in the exploitation of mineral resources – from 6 percent in rock sand to 12 percent in marl.
- No remediation of quarries is carried out.
- Interest in environmental protection is growing; 121 companies with a certificate according to HRN EN ISO 140001 were registered in the period 1997 - 2004.
- Implementation of new commitments relating to the reduction and control of air emissions.
- In 2003, the Act on Environmental Protection and the Energy Efficiency Fund was passed and the basis was created for the industrial sector to introduce economic instruments (charges) that internationalize environmental pollution costs.

Agriculture

- There has been o substantial change in the size and use of agricultural land.
- In the period 2000 - 2005 the amount of land used for eco-agriculture increased 600 times, but is still negligibly small (about 0.2 percent of total agricultural land).
- The number of livestock is growing, but has still not reached pre-war levels.
- About 450,000 agricultural holdings have a size of 8-17 hectares.
- Chemical and physical degradation of agricultural land has not abated.

Forestry

- Forest management is based on sustainable development principles.
- Forest degradation is growing because of transboundary air pollution.
- Forest certification has begun.

Fisheries and Aquaculture

- In 2003, the Protected Ecological and Fishing Zone was designated - with no effect.
- Sustainable management in the open part of

the Adriatic can hardly be implemented due to differences in the size of fleet.
- The portion of the fishing fleet consisting of low-tonnage vessels has increased; in the period 1999 - 2004 the number of fishing vessels increased by about 30 percent, but only 13 percent had a gross volume exceeding 15 GT.
- The catch of sea organisms has increased; in 2004, it amounted to approximately 32,000 tonnes.
- The catch of small oily fish increased considerably and accounts for 85 percent of the total catch of sea organisms.
- Since 2000, the catch of white fish has been slowly increasing; in 2004, it amounted to over 4,300 tonnes.
- Production from mariculture is rising: in the period 1999 - 2003 fish-farming of Atlantic tuna increased nine fold.
- The environmental impact on adjacent habitats is not systematically monitored.
- Production in freshwater fish-farming is stagnating or declining; the species most bred are carp and trout; production reached 5,600 tonnes in 2004.

Transport

- The unfavourable structure of transport is growing; public passenger transport decreased and road transport of goods increased considerably (11 times in the period 1997 - 2004).
- In the period 1997-2003 the number of passenger cars increased by 39 percent.
- The share of leaded petrol is negligible.
- In the period 1998 - 2005 the number of accidents effecting the environment increased almost threefold.
- Combustion control – mandatory eco-testing was introduced in 2004; in the first quarter of 2005 vehicle safety increased by over 30 per cent.

Tourism

- High pressure is concentrated in a short period of time (season) in coastal areas and on the islands; about 95 percent of all overnight stays are registered in the Adriatic region.
- The infrastructure required to support increased accommodation capacities and ports/ marinas is underdeveloped.
- No systematic evaluation of tourist resources is in place.

Chemicals

- The organization of responsibilities has not ensured an integral approach to chemical management.
- There is no integrated system for the monitoring of transport of chemical substances, but specific groups of chemicals such as hazardous chemicals are covered by monitoring.
- The import of chemicals is growing; in 2003, 833 different chemicals in the form of finished chemical products and 256 chemicals as pure substances were imported.
- From 1997 to 2004 the number of water management licenses for chemicals and their preparation increased threefold.

Waste

- The average amount of municipal waste generated in 2004 was 295 kg per capita, which is a 20 percent rise compared to the period 1997 - 2004.
- There are 283 landfills, of which 23 per cent are legal or in the process of legalization.
- Non-compliance with obligations by individual participants in the waste management process.
- No systematic solution for the disposal of hazardous waste.
- Marked progress in landfill remediation and application of the polluter pays principle (packaging waste).

Air

- Compared to 1997 the emission of SO_2 decreased by 25 percent, of lead by 91.5 percent, and of persistent organic pollutants (POPs).
- Since 1999, NOx emissions have slightly decreased; in 2004, it reached the 1995 level, amounting to 68.9 thousand tonnes.
- From 1990 to 2005 the consumption of ozone depleting substances (ODSs) dropped by 80 per cent.
- Ambient air quality in settlements in the period 1997 - 2004: 63 percent of settlements had air quality in Category I, 22 percent were in Category II and 15 percent were in the lowest air quality Category III; in certain industrial centers (Sisak, Rijeka, Kutina) the air is excessively polluted with specific pollutants.
- No air quality monitoring in 10 counties.
- The establishment of a national network for permanent air quality monitoring has begun.
- Transboundary import of air pollution ranges between 50 and 80 per cent of total air pollution.

Climate Change

- The mean annual temperatures show an upward trend and the amounts of precipitation a downward trend.
- In 2004, greenhouse gas emissions amounted to 29.4 million tonnes CO_2-eq.
- Efforts are being made to comply with commitments under the Kyoto Protocol.

Water

- The Republic of Croatia is endowed with abundant water resources, but is faced with relatively unfavourable geographic and calendar-related distribution of waters (e.g. during summer months and especially on the islands).
- About 90 percent of water for public supply is drawn from groundwater.
- The quality of surface and groundwater has not changed compared to the previous period (the late 1990s); in the period 2000 - 2003 surface water was mostly Categories II and III quality; springs had qualities in Categories I and II.
- Pollution pressures are more noticeable in the Black Sea than the Adriatic Sea catchment area because of a higher population density and a higher level of industrial development.

- The share of the population covered by the public water supply system has increased (76 percent of the population in 2002).
- The share of the population connected to the public sewage system has increased (43 percent of the population in 2003); the percentages of the population covered by the public water supply system and the public sewage system still differ considerably.
- Waste water treatment has increased from 12 percent in the previous period to 25 percent in this reporting period, although only 4.4 percent undergo secondary treatment; the number of waste water treatment plants and treatment levels and efficiency are still inadequate.
- 30 percent of total industrial waste water is discharged into the sewage system or receiver completely unpurified.

Sea

- The Croatian part of the Adriatic has a very high quality; only specific semi-closed coastal areas are moderately polluted.
- Sanitary fitness of the sea water on beaches is high; in 2005 98.5 percent of samples were found to be of high quality.
- Considering the eutrophication level, the sea shows a good quality and on average no major changes; the largest portion of Croatia's Adriatic coast is an oligotrophic area, whereas some narrow regions such as the Vranjica Basin and the bays of Šibenik and Bakar are mesotrophic areas.
- The load of hazardous substances on marine eco-systems in the Adriatic is below limit values.
- The distribution of invasive foreign species, especially of *Caulerpa* algae, is growing.
- The volume of marine transport and transhipment of hazardous substances in ports has increased considerably (25 percent).
- Entries from foreign ports have increased fourfold; there is an increasing problem with ballast waters.
- In the period 1998 - 2004, 516 cases of polluting the sea and marine property were recorded, of which 24 percent may be attributed to vessels.
- In the period 1997 - 2004 the number of marinas doubled.
- Absence of an integrated coastal area management.

Soil

- Absence of the required soil protection legislation.
- No systematic soil quality monitoring.
- Non-recognition of the importance and equality of soil as an environmental component.

Biodiversity

- Croatia's biodiversity far exceeds that of Europe.
- Systematization, inventorying and monitoring of changes have only just begun.
- Since 2000, considerable progress has been made in preparation of red books.
- Threatened species have become protected.
- The spread of invasive taxa has been recorded,

referring mostly to *Caulerpa taxifolia* and *Caulerpa racemosa*.

- The use of GMOs in closed systems, their introduction into the environment, and placement on the market are being legally regulated.
- Measures have been taken to protect karst areas.
- The number and size of protected nature areas are increasing (9.06 percent of the mainland); the protection of marine areas does not follow this trend.
- The preparation of plans for the management of protected areas has begun.

Environment and health

- Lack of targeted research in cases of polluted working and living environments and effects on human health.
- The percentage of sanitary non-complying drinking water samples is falling; it is constantly below 10 per cent.
- Ambient air quality in settlements has generally improved compared to 1990.

3.2. PRECONDITIONS AND KEY MEASURES TO IMPROVE THE STATE

• SYSTEMATIC DATA COLLECTION

Harmonization of data collection and processing methodologies and introduction of national standards complying with those of the EU is one of the key activities expected to facilitate monitoring of the state of the environment and implementation of environmental policies in the Republic of Croatia.

• BETTER ORGANIZATION OF THE STATE

The establishment of good quality, functional horizontal and vertical connections at all levels of the state administration will contribute to its efficiency and to timely and coordinated environmental actions.

• INCLUSION OF ENVIRONMENTAL OBJECTIVES AT THE NATIONAL LEVEL IN STRATEGIC PLANS AND DOCUMENTS OF MAJOR SECTORS

The understanding and inclusion of environmental requirements, needs and objectives in planning and development documents of all sectors that are sources of environmental pressures will provide the conditions for a long-lasting environmental protection at the national level.

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