

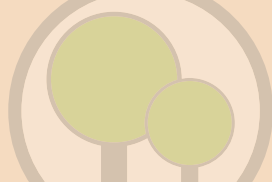
The Environment In Your Pocket I - 2011



CROATIAN
ENVIRONMENT AGENCY



THE ENVIRONMENT IN YOUR POCKET



THE ENVIRONMENT IN YOUR POCKET I – 2011

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THE ENVIRONMENT IN YOUR POCKET

Introduction



Dear readers,

Your interest expressed in monitoring environmental status and trends and our task of reporting on the same have encouraged us to prepare the seventh consecutive issue of the publication *The Environment in Your Pocket I - 2011*. This time again we have chosen to present relevant indicators for air, climate change, inland waters, sea and coastal area, soil and land, biodiversity, forestry, agriculture, waste management, energy, industry, tourism, fisheries and aquaculture, transport, health and safety and public relations. Continuing our practice to improve the method of data collection and processing, this year's publication is expanded with a new thematic area entitled "General Environmental Issues". It incorporates themes necessary for accomplishment of goals and implementation of policies whose monitoring makes it possible to evaluate their fulfilment, effectiveness and justification.

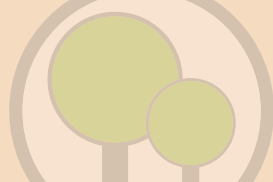
We believe that this booklet will answer some of your questions, encourage you to put some new ones and continue to promote interest in preservation and protection of the environment as a natural asset that present and future generations depend on.

Croatian Environment Agency



THE ENVIRONMENT IN YOUR POCKET

Table of Contents



<i>Croatia – Basic Data</i>	1	<i>Forestry</i>	
<i>Air</i>		Naturalness of Forests and Growing Forms	13
Mean Annual NH ₃ Concentrations in the Air	2	Impact of Forestry on Climate Change	14
Particulate Matter PM _{2.5} Emissions	3	<i>Agriculture</i>	
<i>Climate Change</i>		Number of Farming Units	15
Greenhouse Gas Emissions.....	4	Farming Unit Areas	16
Greenhouse Gas Emissions from the Transport Sub-sector.....	5	<i>Waste Management</i>	
<i>Inland Water</i>		Waste Management Fees.....	17
Urban wastewater treatment	6	Animal By-products	18
Oxygen Consuming Substances in Rivers.....	7	Landfills	19
<i>Sea And Coastal Area</i>		<i>Energy</i>	
Nutrients (N, P) in Transitional, Coastal and Marine Waters.....	8	Electricity Consumption by Sectors	20
Phytoplankton Algae in Transitional and Coastal Waters	9	Total Energy Consumption.....	21
<i>Land And Soil</i>		<i>Industry</i>	
Mine Suspected Areas	10	Extraction of Mineral Raw Materials	22
<i>Biodiversity</i>		<i>Tourism</i>	
Native Breeds	11	Foreign vessels on cruise in the Republic of Croatia	23
Known and Endemic Taxa.....	12	Trends in Registered Tourist Traffic	24



THE ENVIRONMENT IN YOUR POCKET

Table of Contents



Fisheries

Status of Marine Organisms Stocks	25
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Transport

Fuel Consumption and Number of Registered Vehicles	26
Public Passenger Transport	27

Health And Safety

Drinking Water Safety Control	28
Vector-Borne Diseases	29

General Environmental Issues

Environmental Protection Programmes	30
Number and Breakdown of Public Inquiries Addressed to the Croatian Environment Agency, 2006-2010	31

<i>Abbreviations</i>	32
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<i>Glossary</i>	34
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THE ENVIRONMENT IN YOUR POCKET

Croatia - Basic Data



Mainland surface area	56 594 km ²
Territorial sea surface area.....	31 067 km ²
Coastline length	5 835,3 km
Islands, rocks, reefs	1 185
Highest mountain summit.....	Mt. Dinara 1 831 m
Counties	21
Cities and municipalities	550 (124 i 426)
Population	4 437 460
Population density per km ²	78,5
Populated islands	47
Language	Croatian
Alphabet.....	Latin
Political system	Parliamentary democracy
GDP per capita in 2010	10 123 EUR



AIR

Mean Annual NH₃ Concentrations in the Air

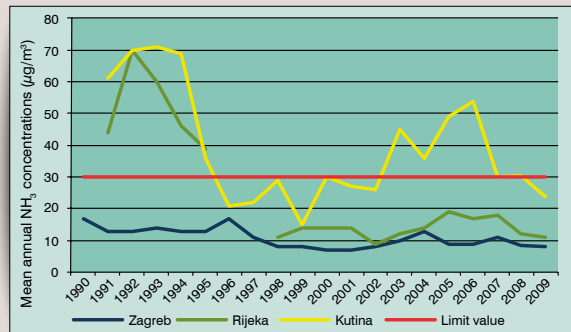
Ammonia (NH₃) is a colourless gas with a characteristic pungent odour that occurs naturally in the environment (a result of organic matter decomposition). Agriculture, industry and road transport are major sources of ammonia emissions in the air. Ammonia also contributes to the production of acid rain and consequently causes the disturbance of the natural balance in the environment (eutrophication and acidification). Elevated ammonia concentrations in the air have adverse effects on human health, particularly on the respiratory system.

Trend and Current State

Agriculture (the use of organic and mineral fertilizers) is the predominant source of NH₃ emissions and accounts for more than 80% of total NH₃ emissions. Other major sources of NH₃ emissions into the air include septic tanks with a share of 8.7%, industrial processes (production of ammonia, nitric acid and fertilizers) with a share of 4.5%, and road transport (1.7%). NH₃ concentrations in the air have been measured in Zagreb, Rijeka and Kutina since 1990. In the first half of the 90s high mean annual NH₃ concentrations were recorded in Rijeka and Kutina. In the following period mean annual NH₃ concentrations in Rijeka lay constantly below the limit value, but

continued to grow in Kutina, reaching 54 µg/m³ in 2006. However, NH₃ concentrations decreased to the level of prescribed limit values¹ in the next year as a result of upgraded industrial production processes (especially fertilizer production). In Zagreb mean annual NH₃ concentrations in the air lie constantly below the limit value.

Mean annual NH₃ concentrations in the air of Zagreb, Rijeka and Kutina



¹ Regulation on Limit Values of Pollutants in Ambient Air (OG 133/05)



AIR

Particulate Matter PM_{2.5} Emissions

Particulate matter less than 2.5 μm in diameter (PM_{2.5}) is a mixture of organic and inorganic substances, heavy metals and tiny dust particles. Due to their size they penetrate and reside in the lower respiratory tract, cause inflammatory processes and reduce human resistance to allergies and infections. Since they have a significant impact on human health, the concentration of PM_{2.5} is one of the most important air pollution indicators. PM_{2.5} emissions result mostly from the combustion of solid and liquid fuels in stationary and mobile sources. The PM_{2.5} emission inventory is obligatory under the LRTAP Convention.

Trend and Current State

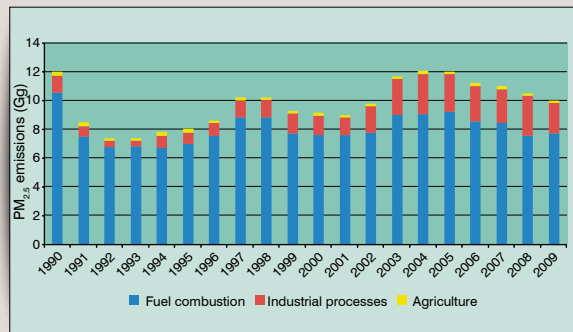
Total PM_{2.5} emissions in 2009 amounted to 9.98 Gg, which is 17% lower compared to the base year 1990. This is due to a decline in emissions from the fuel combustion sector caused by the use of low ash content fossil fuels, increased use of natural gas and reduced quantities of fertilizers in the agriculture sector.

A considerable increase in PM_{2.5} emissions in the industrial processes sector was recorded in the period 2002 - 2008 as a result of increased activities in the road asphalt paving sector and in the sector of building construction and pulling down. However, in 2009 emissions from this sector decreased too.

Since 2005 total PM_{2.5} emissions have been continuously declining. In 2009, a major contribution (77%) to total emissions was made by the fuel combustion sector, followed by the industrial pro-

cesses sector (21%) and the agriculture sector (2%).

Particulate matter PM_{2.5} Emissions



Year	1990	1995	2000	2005	2009
Gg	12,01	8,03	9,13	11,96	9,98



CLIMATE CHANGE

Greenhouse Gas Emissions

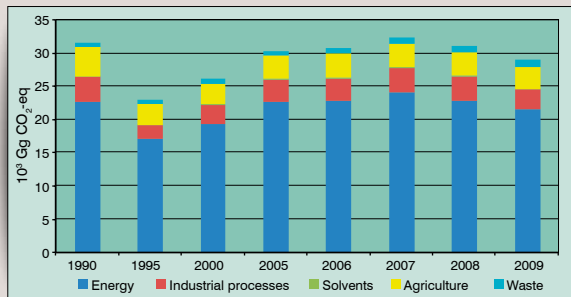
Greenhouse gases CO_2 , CH_4 and N_2O are constituent parts of the atmosphere, whereas HFCs, PFCs and SF_6 are emitted into the atmosphere largely as a result of human activities. Increased intensity of human activities and technological development caused a strong rise in greenhouse gas concentrations and consequently resulted in the climate change. These changes are reflected in the global temperature increase, desertification, the sea level rise, etc.

Trend and Current State

The Kyoto Protocol adopted in 1997 committed the parties to the United Nations Framework Convention on Climate Change (UNFCCC) to reduce their greenhouse gas emissions compared to the base year 1990. By becoming a party to the UNFCCC in 1996, the Republic of Croatia assumed all obligations arising from the Kyoto Protocol. The target for the first commitment period (2008-2012) is a 5% reduction of greenhouse gas emissions compared to the base year.

Total greenhouse gas emissions in 2009 without removal by sink amounted to 28 865 $\text{GgCO}_2\text{-eq}$. Since 2007 total emissions have been showing a downward tendency.

Greenhouse gas emissions by sectors ($\text{Gg CO}_2\text{-eq}$)



Year	1990	1995	2000	2005	2006	2007	2008	2009
Energy	22 534	17 056	19 281	22 599	22 675	24 044	22 813	21 462
Industrial processes	3 809	2 012	2 854	3 271	3 421	3 604	3 570	2 962
Solvents	107	98	90	177	205	228	219	131
Agriculture	4 378	3 067	3 135	3 478	3 498	3 439	3 427	3 314
Waste	612	744	656	748	863	892	932	996
Total	31 440	22 976	26 016	30 273	30 662	32 208	30 961	28 865

Source of data: CEA



CLIMATE CHANGE

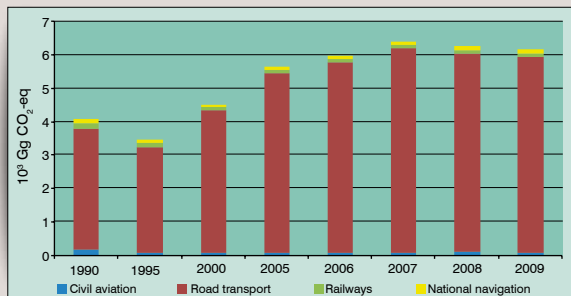
Greenhouse Gas Emissions from the Transport Sub-sector

Emission sources and greenhouse gas sinks have been monitored in six main sectors: energy, industrial processes, use of solvents and other products, agriculture, land use, land use change, forestry and waste management. The energy sector that covers all activities relating to fuel combustion in stationary and mobile sources and fugitive emissions from fuel includes five sub-sectors. One of them is transport that is associated with fuel combustion and evaporation in the road, air, rail and water transport.

Trend and Current State

The share of energy sector in total national greenhouse gas emissions in 2009 amounted to 74% CO₂-eq. The transport sub-sector accounted for 28.7% of total CO₂ emissions from the energy sector. The largest contributors to emissions are the road transport (95%), the national navigation - marine and inland waterways (2.3%) and the rail transport (1.5%), with the smallest contribution arising from civil aviation (1.3%). An upward trend of emissions coming from this sub-sector since 1990 is a consequence of increased mobility, i.e. daily migrations from the place of residence to the place of work and the number of road vehicles. Compared to the base year 1990 the total number of vehicles in 2009 increased twofold. Nevertheless, since 2007 total emissions coming from the transport sub - sector have been slightly declining.

Greenhouse gas emissions from the transport sub-sector



Year	1990	1995	2000	2005	2006	2007	2008	2009
Civil aviation	156	79	55	67	74	77	89	78
Road transport	3 631	3 148	4 276	5 373	5 670	6 094	5 920	5 843
Railways	139	107	86	96	102	103	102	90
National navigation	134	99	86	100	104	108	131	146
Total	4 059	3 432	4 503	5 636	5 950	6 382	6 242	6 156



INLAND WATER

Urban wastewater treatment

Wastewater is collected by the sewage system and conveyed to wastewater treatment plants to be treated by different types of treatment before discharge into natural recipients. Discharge of untreated or inadequately treated wastewater into watercourses and marine waters may have considerable negative effects on the water quality. Collection and treatment of wastewater and its treatment prior to discharge into natural recipients is one of the measures that, if successfully implemented, indicates the level of water protection against pollution.

Trend and Current State

In 2009 in operation were 108 urban wastewater treatment plants (33 pre-treatment, 20 primary, 49 secondary and 6 tertiary treatment level). At the urban wastewater treatment plants 62% of wastewater collected by the sewage system was treated. About 44% of the population are connected to sewage systems. The number of households plugged to sewage systems that are connected to municipal wastewater treatment plants did not increase at a rate planned because of unfavourable economic conditions, high costs of constructing a secondary network and the amount of connection charges. Apart from a systematic growth in utilization of existing capacities and plant efficiency enhancement, it is important to adopt and implement prevention measures with the aim to reduce

wastewater amounts and phosphate inputs to water and to improve competence of experts maintaining the operation of the plants.

Spatial distribution of urban wastewater treatment plants, 2009



Source of data: Croatian Waters



INLAND WATER

Oxygen Consuming Substances in Rivers

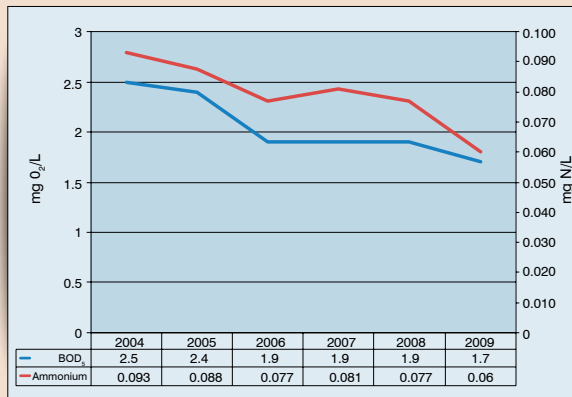
Biological oxygen demand (BOD₅) and ammonium are indicators of the presence of organic pollution in inland surface water coming from the municipal and industrial sector. High values of these indicators are a sign of reduced oxygen concentrations in water and, consequently, of water quality degradation which may have an impact on biodiversity of aquatic ecosystems

Trend and Current State

According to measured BOD₅ and ammonium values and the relevant regulations² rivers are categorized in water class I and II, which means categories of a very good and good state. In the period 2004 - 2009 a slight downward tendency of biological oxygen demand and ammonium concentrations in inland water was recorded, indicating a slight reduction in organic pollution of surface water. This tendency is largely a result of the construction of sewage systems and putting newly constructed urban wastewater treatment plants into operation.

² Regulation on Water Classification (OG 77/98, 138/08)

Median of annual mean values of BOD₅ and ammonium in rivers



Source of data: Croatian Waters



SEA AND COASTAL AREA

Nutrients (N, P) in Transitional, Coastal and Marine Waters



An increased input of nutrients (N and P) into transitional and coastal waters may result in a number of undesired and interconnected phenomena such as intensive growth and multiplication of phytoplankton algae that cause an increase in chlorophyll a concentrations and reduce the transparency of the sea. At the same time, phytoplankton algae excessively multiplied by consuming nutrients die and fall to the bottom. Their decomposition requires a great amount of oxygen which has an adverse effect on the marine organisms.

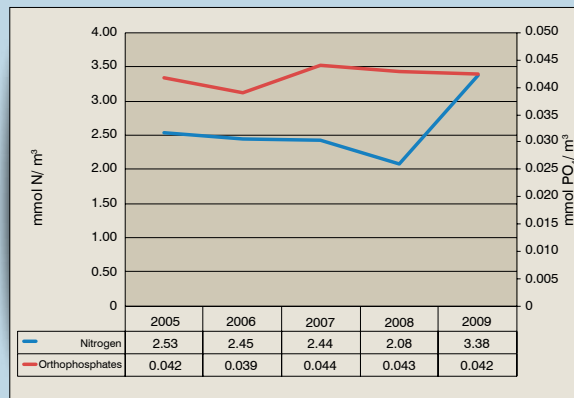
Trend and Current State

In the period 2005 – 2009 increased concentrations of total inorganic nitrogen were recorded at monitoring stations located in the area of the Krka estuary, the Neretva canal and the bays of Mali Ston, Kaštela and Bakar. Apart from anthropogenic impacts, in the Northern and Central Adriatic this is largely due to hydrological conditions, or rather, to the different inflow of surface freshwater and groundwater. For that reason, increased concentrations of inorganic nitrogen were recorded at most of monitoring stations in 2009. The highest value was recorded at the monitoring station in the port of Šibenik and amounted to 14 mmol N/m³.

According to average values, orthophosphate concentrations may be categorized as very low (Northern Adriatic) and low (Southern and Central Adriatic), with the highest concentration in 2009 measured in the port of Šibenik.

* (dissolved inorganic nitrogen = nitrates + nitrite + ammonium salts)

Mean annual concentrations of nitrogen* (mmol N/m³) and orthophosphates (mmol PO₄/m³) in a 0-10 m layer of transitional, coastal and marine waters



Source of data: IOF, Split



SEA AND COASTAL AREA

Phytoplankton Algae in Transitional and Coastal Waters



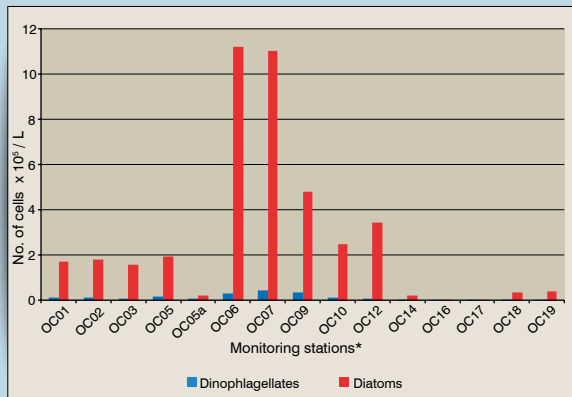
An occasional rapid increase in the population of phytoplankton in the sea (algal bloom) is a natural phenomenon, but may also be a consequence of anthropogenic pollution caused by excessive nutrient input to the sea, either directly or by watercourses. The bloom of certain phytoplankton species is characterized by production of large amounts of slime that render the seawater unfit for bathing, but are not harmful to human health. However, certain phytoplankton groups release toxins that accumulate in marine organisms and, if they enter the food chain (shellfish), may pose threat to human health.

Trend and Current State

In 2009 phytoplankton bloom was recorded in the areas of Istria, the Novigrad sea, Šibenik and the bays of Rogoznica and Mali Ston. This harmful and toxic bloom was largely caused by phytoplankton organisms of the dinophlagellate group. The blooms of the diatom *Pseudo-nitzschia* spp. were predominantly recorded in the cold season and those of the dinophlagellate species (genus *Dinophysis*) in the warmer part of the year. Late in August 2009 the bloom of the species *Prorocentrum triestinum* (dinophlagellate) was recorded in the Dubrovnik area, but had no harmful effects on the marine ecosystem.

* Locations of monitoring stations are indicated in the publication glossary.

Phytoplankton in the eastern Adriatic, 2009





LAND AND SOIL

Mine Suspected Areas

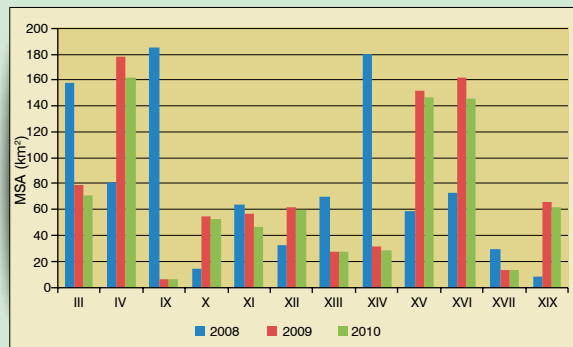
Mine suspected areas are areas contaminated by mines and unexploded ordnance as a consequence of war operations during the Homeland War. Through continuous institutional and humanitarian activities and application of up-to-date techniques and technologies, the Republic of Croatia is successfully carrying out a highly complex process of mine clearance of areas and buildings.

Trend and Current State

Year by year mine suspected areas get increasingly smaller. On 31 December 2010 about 820 km² of Croatia's territory within 100 municipalities and towns in 12 counties were still mine suspected. In 2010 mine suspected areas decreased by 14% compared to 2008. In this period considerable areas in the Osječko-Baranjska, Ličko-Senjska, Sisačko-Moslavačka i Zadarska County were cleared of land mines and returned to use. Apart from mine suspected areas registered till then, in 2009 the CMAC identified areas contaminated by solely unexploded ordnance in 6 counties and 19 towns and municipalities. The majority of newly marked areas are located in the Karlovačka, Vukovarsko-Srijemska, Šibensko-Kninska and Du-

brovačko-Neretvanska County.

Size of mine suspected areas by counties*



Source of data: CMAC

* The list of counties and the City of Zagreb with corresponding marks (I-XXI) may be found in the publication glossary.



BIODIVERSITY

Native Breeds

Native breeds have evolved as a result of traditional breeding and represent a part of the national genetic and cultural heritage. Genetic resources are one of the most valuable and most important preconditions for preservation of biodiversity. Disappearance of any part of autochthonous and protected breeds leads therefore to its degradation.

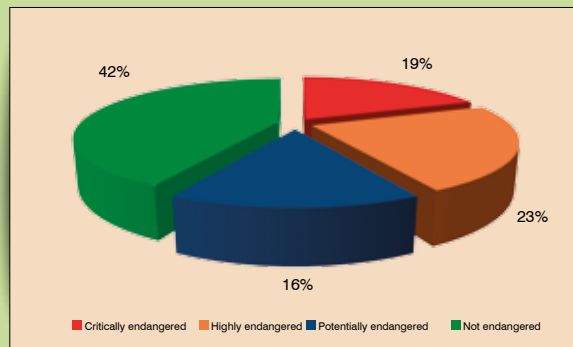
Trend and Current State

According to criteria³ and regulations⁴, 26 native breeds of domestic animals have been recorded in the Republic of Croatia. Native breeds reared in the country are registered with the CAA that estimates their level of threat on a national scale and according to the FAO classification. Categorization of the breed status distinguishes four levels of threat according to which native breeds are critically endangered, highly endangered, potentially endangered and not endangered. According to the 2010 data, there are 19% of critically endangered breeds, including the Međimurje horse, the Istrian ass, the Buša cattle, the Ruda sheep, the Zagorje turkey and the Hrvatica hen. Potentially endangered breeds in Croatia are the Croatian posavac horse, the Croatian coldblood, the Croatian white goat and the Slavonian black pig.

³ Ordinance on the Procedure for Recognition of New Breeds, Strains and Hybrids (OG 164/04)

⁴ Lists of Native and Protected Breeds and Strains of Domestic Animals Evolved in the Territory of Croatia (OG 127/98, OG 73/03, OG 39/06, OG 126/07)

State of threat to native breeds, 2010





BIODIVERSITY

Known and Endemic Taxa

Endemics are taxa native to a particular place. If such a taxon is restricted to a very small area, exclusively within the national boundaries, it represents a stenoendemic taxon. A high number of endemics in relation to the total number of known taxa points to valuable biodiversity.

Trend and Current State

Due to special ecological, climatic and geomorphological conditions and a great number of diverse habitat types, the Republic of Croatia is abundant in endemic flora and fauna. One of the reasons for such a great number of endemics, especially tertiary relicts, is the fact that areas of the country have not experienced any major effects of glaciation. Of the total number of all known taxa (about 38 268), as many as 2.8% are considered endemic. The main centres of endemic flora are the Biokovo and Velebit mountains, while endemic fauna is largely distributed in underground habitats, karst rivers, the Adriatic water basin and on islands.

Of the total number of known plant taxa, 5.9% are endemics, with the majority of them belonging to the group of vascular flora (as many as 365 taxa) and the group of algae (152 taxa). Some of the most famous plant endemics that are stenoendemics at the same time are the silvery dwarf harebell (*Edraianthus pumilio*), the *Degenia velebitica* and the Dubrovnik cornflower (*Centaurea ragusina*). Of all animal taxa the majority of endemic taxa belong to amphibians (35%).

Known and endemic taxa by groups in Croatia, 2010

Group	Total number of known taxa	Number of endemic taxa	Share of endemic taxa by groups (%)
<i>Fungi</i>	4 500	0	0
<i>Lichen</i>	1 019	0	0
<i>Plants</i>	8 871	523	5.9
<i>Land invertebrates</i>	15 230	352	2.3
<i>Freshwater invertebrates</i>	1 850	171	9.2
<i>Marine invertebrates</i>	5 655	0	0
<i>Freshwater fish</i>	152	17	12.0
<i>Sea fish</i>	442	6	1.4
<i>Amphibians</i>	20	7	35.0
<i>Reptiles</i>	41	9	21.9
<i>Birds (total)</i>	387	0	0
<i>Mammals</i>	101	5	4.9
TOTAL	38 268	1 090	2.8

Source of data: SINP



FORESTRY

Naturalness of Forests and Growing Forms

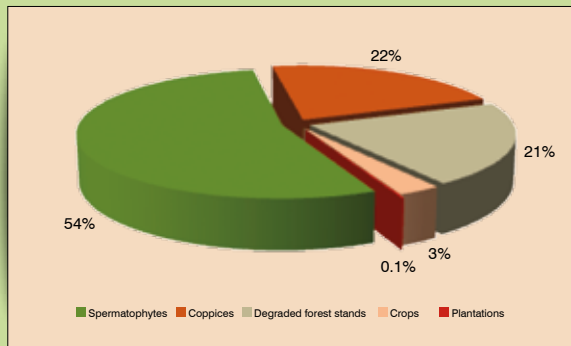


Given 95% of natural composition of the forest stand, Croatia's forests show a very high level of preservation of natural structure, which is especially valuable and rare compared to forests of other European states. Natural rejuvenation of forests is therefore one of the most important indicators of their naturalness.

Trend and Current State

In the Republic of Croatia forests and forest land cover a total of 2 688 687 hectares, or 47.5% of the country's land area. Forests have for the most part a natural structure and are of a natural origin, so that spermatophytes, as forest stands of a high growing form, cover the greatest part of the area (1 283 629 ha). Coppices as components of a low growing form participate in the total forest area with 533 828 hectares and degraded forests with 513 144 hectares. Artificial forest tree plantations under crops cover an area of 69 953 hectares and plantations 2 227 hectares. Clear cutting is restricted by statutory regulations, which contributes to preservation of forest naturalness.

Share of different growing forms in the total forest area





FORESTRY

Impact of Forestry on Climate Change

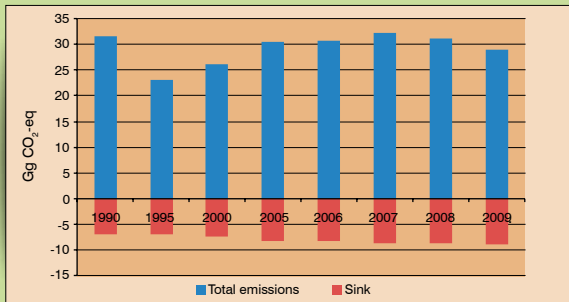
Forests and forest land play an important role in regulating the level of total greenhouse gas emissions because they remove a part of carbon (C) from the atmosphere by assimilation (in form of CO₂) and binding into organic compounds. Sustainable forest management is therefore of utmost importance to climate change mitigation.

Trend i trenutno stanje

Forests and forest vegetation assimilate about 20% of all greenhouse gas emissions in the Republic of Croatia. The reduction of areas covered by forest vegetation (e.g. as a result of a small increase in forest mass or increased fire-affected areas) leads consequently to a rise in the greenhouse gas emission level. An adequate management that implies that e.g. the cutting lies below the annual increase in forest stock, and that state-owned forests are naturally rejuvenated will ensure an increase in forest mass. In this manner carbon from the atmosphere is “integrated” into the biosphere, thus affecting directly the downward tendency of greenhouse gas emissions and, consequently, the mitigation of climate change effects too



Total greenhouse gas emissions and sinks (Gg CO₂-eq)



A greenhouse gas sink in total emissions is indicated with a negative sign.

Year	1990	1995	2000	2005	2006	2007	2008	2009
Total emission GgCO ₂ -eq	31.440	22.976	26.016	30.273	30.662	32.208	30.961	28.865
Sink GgCO ₂ -eq	-6.934	-6.863	-7.218	-8.100	8.215	-8.506	-8.643	-8.712

Source of data: CEA



AGRICULTURE

Number of Farming Units

Farming units as agents of agricultural activities play an important role in sustainable development of rural areas. They are key factors in conservation of cultural, biological and landscape diversity.

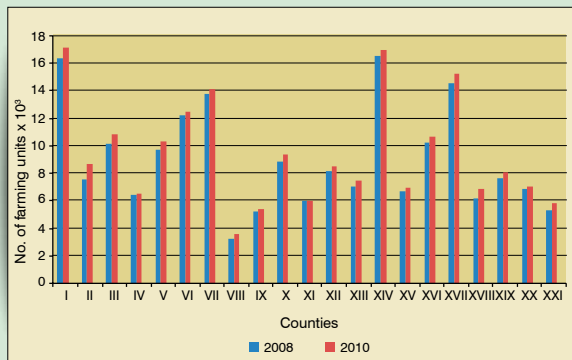
Trend and Current State

According to data from the Registry of Farms kept by the Paying Agency for Agriculture, Fisheries and Rural Development (PAAFRD), the number of farming units in the period 2008-2010 increased from 189 036 to 197 104 (by 4%). The highest number of newly appearing farming units was recorded in the Krapinsko-Zagorska (1 101), Zagrebačka (738) and Sisačko-Moslavačka (691) County. The lowest increase was recorded in the Ličko-Senjska (115), Karlovačka (113) and Požeško-Slavonska (only 12 farms) County. Compared to the total number of farming units in 2008, the highest increase in newly appearing farming units was recorded in the Krapinsko-Zagorska (by almost 15%) and the Istarska County and in the City of Zagreb (each by 10%). The increase was the lowest in the Koprivničko-Križevačka (1.8%), Karlovačka (1.8%) and Požeško-Slavonska County (only 0.2%).

* List of counties and the City of Zagreb with corresponding marks (I-XXI) may be found in the publication glossary.



Number of farming units by counties*





AGRICULTURE

Farming Unit Areas

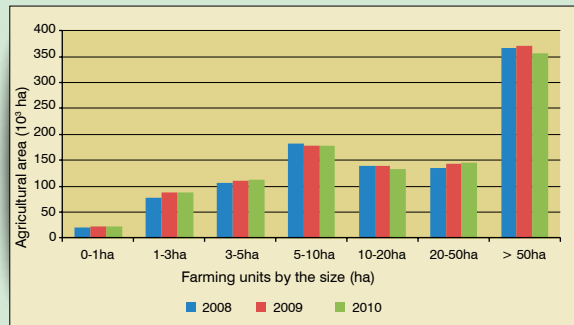


From the economic point of view, the aggregation of farming unit areas aims at strengthening rural areas. However, orientation towards intensive agriculture must be accompanied by good agricultural and environmental programmes so as to reach a compromise between cost-effective and sustainable management.

Trend and Current State

According to data provided by PAAFRD, farming units in 2010 owned 1 035 957.6 hectares of agricultural land, which is a 1% increase compared to 2008. In this period, considering the farming unit categories, a downward tendency was recorded of areas owned by farms covering 5-10 hectares (2%), 10-20 hectares (3.4%) and exceeding 50 hectares (2.5%). On the other hand, an upward tendency of total agricultural areas owned by farming units was evident in categories of farming units whose agricultural areas covered 0-1 hectare (7%), 1-3 hectares (12.1%), 3-5 hectares (5%) and 20-50 hectares (6%). The data indicated point to the trend of aggregating small, predominantly family farming units covering up to 5 hectares, as well as those covering 20-50 hectares that, together with the category of farming units exceeding 50 hectares, form a basis for the bulk of intensive agricultural production.

Farming unit areas



Source of data: PAAFRD



WASTE MANAGEMENT

Waste Management Fees

Waste management fees are introduced with the aim to encourage the reduction of waste amounts, or rather the reduction of environmental impacts, according to the “producer responsibility” and the “polluter pay” principles.

Trend and Current State

Fees for environmental burden caused by hazardous and non-hazardous production waste and fees for placing on the market products that upon expiry of their lifetime become one of the six special waste categories have been legally imposed since 2004. The funds raised by such fees are used to finance the disposal of waste categories mentioned. The fee for environmental burden caused by municipal waste is not collected yet, although enacted. Until 2008 the amount of fees collected kept increasing (948 million kuna), but in 2009 a 15.4% decrease was recorded. This was due to uncollected debts and reduced unit fees payable by manufacturers/importers (as a result of economic crisis). The amounts paid for financing the recycling/disposal of special waste categories were increasing until 2008 (833.9 million kuna), but in 2009 they decreased by 6.1% (782.8 million kuna). Until 2010 only five local self-government units introduced the obligation of paying a fee to owners for the reduced market value of their real properties in the impact zone of the building used for waste disposal.

Amounts of waste management fees paid

Type of fee	Amounts of fees paid (expressed in million kuna)				
	2005	2006	2007	2008	2009
Environmental burden fees – total	3.55	8.28	9.78	8.3	1.5
Non-hazardous production waste	3.46	6.03	8.86	8.28	1.49
Hazardous waste	0.09	2.25	0.92	0.02	0.01
Fees on special categories - total	27.4	419	832	939	800
Packaging waste	27.4	398	628	562	537
Waste tyres	0	21	45	42	32
End-of-life vehicles	0	0	88	104	57
Waste oils	0	0	30	49	42
Batteries and accumulators	0	0	8	13	10
EE waste	0	0	33	169	122



WASTE MANAGEMENT

Animal By-products

Animal by-products (ABP) may be afterwards processed or used for other purposes, such as feed for other animals, in diagnostics (blood) or in bio-gas production (fats). Materials of this kind that are harmful to the environment and health and life of humans and animals must be destroyed, mostly by incineration.

Trend and Current State

The method of handling, processing, using and disposing of this type of waste is determined by statutory provisions^{5,6}. Consistent with the EU requirements, the handling of animal by-products is determined according to the risk level (category I representing the highest and category III the lowest risk).

In 2010, 43 establishments (ABP collection and processing facilities) intended for animal by-product management were approved and 32 waste carriers registered for this type of waste.

The amount of animal by-products disposed of by concessionaires totalled 86 197 tonnes in 2007, 88 163 tonnes in 2008 and 85 605 tonnes in 2009. Considering the risk level, the amount of animal by-products of category I and II collected in 2009 was 22 799 tonnes, which is a 17.4% rise compared to 2007, when 19 413 tonnes were collected. In these categories carcasses accounted for about 37%.

⁵ *Veterinary Act (OG 41/07)*

⁶ *Ordinance on Animal by-products not intended for Human Consumption (OG 87/09)*

* *List of counties and the City of Zagreb with corresponding marks (I-XXI) may be found in the publication glossary.*

In 2009, 54 344 tonnes of animal by-products of category III were collected, which is a decrease of 12% compared to 2007, when 60 848 tonnes were collected.

Total amounts of ABPs collected by counties* (10³ t)

Year	COUNTY						
	I and XXI	II	III	IV	V	VI	VII
2007	24.6	1.2	1.4	1.9	15.2	2.6	1.6
2008	24.1	1.5	1.5	1.7	14.9	2.9	1.6
2009	23.1	2.5	2.1	1.4	13.6	3.4	1.6
Year	VIII	IX	X	XI	XII	XIII	XIV
2007	1.8	0.04	1.5	0.9	5.3	2.6	4.5
2008	1.6	0.2	1.7	1.1	5.6	3.4	4.7
2009	1.6	0.1	1.8	0.9	5.7	3.5	4.6
Year	XV	XVI	XVII	XVIII	XIX	XX	TOTAL
2007	0.2	1.3	4.8	5.1	0.5	9.2	86.2
2008	0.2	1.2	4.9	5.3	0.5	9.3	88.2
2009	0.3	0.9	4.7	5.3	0.3	8.0	85.6

Source of data: MAFRD

Data relating to the Zagrebačka County and the City of Zagreb are integrated.



WASTE MANAGEMENT

Landfills

Efforts are being made to reduce possible adverse effects that landfills can have on environment by laying down stringent technical requirements through regulations in line with the European Directive on the landfill of waste⁷. Apart from polluting waters and the air and producing gas emissions, landfills degrade the landscape, occupy the land and are frequently a source of unpleasant odours.

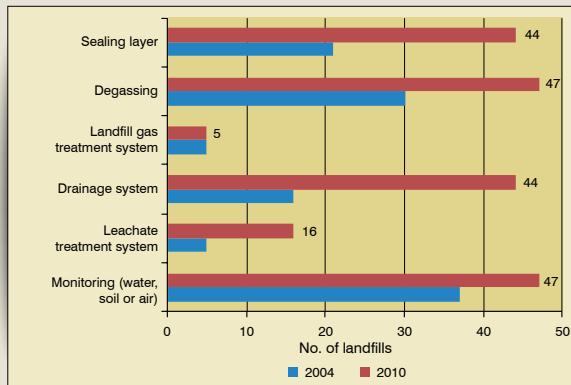
Trend and Current State

For a total of 300 official landfills established in the Republic of Croatia by the end of 2010 remediation processes are underway or completed. Remediation of 93 landfills is completed and the waste removed completely from 62 of them. Waste is actively landfilled at 148 official sites.

In 2010, 112 landfills possessed a valid location permit, 77 a building permit and 20 an operating permit, which is a progress compared to 2004 when 50 landfills were reported to have possessed a building permit, 27 a location permit and only 8 an operating permit. The number of operators possessing a waste disposal permit in compliance with the Act⁸ increased from 65 in 2005 to 106 in 2010. The estimated total amount of waste landfilled at all official landfills increased from about 35.5 million m³ in 2004 to 41 million m³ in 2010. Remediation activities contracted for 996 of estimated

3 000 illegal landfills will be financed partly by EPEEF. Until 2010 a total of 649 landfill sites were remedied.

Environmental protection measures at landfills



⁷ Council Directive 99/31/EC on the landfill of waste

⁸ Waste Act (OG 178/04, 111/06, 60/08, 87/09)



ENERGY

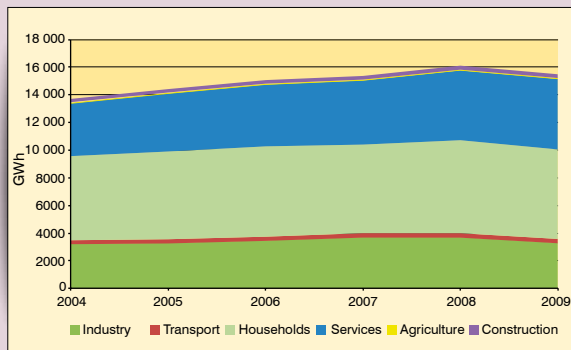
Electricity Consumption by Sectors

Electricity generation and its use in households, services, transport and industrial production ensure adequate social development and standard of life, but cause directly and indirectly environmental loads (emissions from energy sector, construction of energy facilities and energy infrastructure, growth of industrial and agricultural production, increased waste amounts, etc.). Indicators give an insight into total electricity consumption by three characteristic sectors of final demand; industry, transport and other sectors.

Trend and Current State

In 2009 final demand electricity consumption was by almost 4% lower compared to the previous year. Speaking of sectors, electricity consumption decreased by as much as 10.9% in the industry sector and by 3.6% in the transport sector. In the other sectors which includes households, services, agriculture and construction, a total electricity consumption drop of 1.8% was recorded. So, electricity consumption in households decreased by almost 4% and in construction by 6%, whereas in services and agriculture it increased by only 1% and 0.4% respectively. This decrease in electricity consumption is presumably associated with global recession.

Electricity consumption by sectors



Source of data: EIH/P



ENERGY

Total Energy Consumption

Total energy consumption meets all energy needs and includes final energy demand, energy conversion losses, energy used for power plant operation, energy transport and distribution losses and non-energy consumption. Efforts are being made to increase the share of electricity generated from renewable sources so as to reduce environmental impacts of energy and promote the conservation of natural resources that are sources of energy.

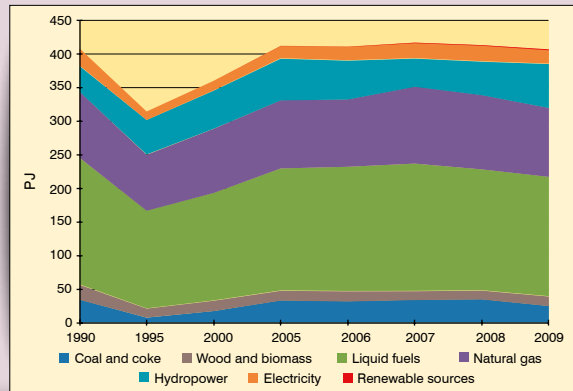
Trend and Current State

In 2009, total energy consumption in the Republic of Croatia was reduced by 1.6% compared to the previous year. Considering the structure of energy forms in total consumption, the consumption of electricity decreased by 13.6%, of natural gas by 7.3% and of liquid fuels by 1.2%, while the consumption of energy generated from coal and coke decreased by as much as 28.8%. Despite a very low share of renewable energy sources in total energy consumption, the highest increase (47.4%) was recorded from these very sources.

In 2009, the share of coal and coke in total energy consumption amounted to 6%, of wood and biomass 3.5%, of liquid fuels almost 44%, of natural gas 25%, of hydropower 16%, of electricity 5% and renewable energy sources only 0.4%.

hydrological conditions in 2009, there was a considerable growth in hydropower consumption (31%) and in the consumption of wood and biomass (by 4.5%).

Structure of total energy consumption by planned use, 1990-2009





INDUSTRY

Extraction of Mineral Raw Materials

The Republic of Croatia is characterized by a wide variety of non-metallic mineral raw materials of which building stone (BS), architectural structural stone (ASS), building sand and gravel, brick clay and hydrocarbons (petroleum, gas) are mostly exploited. Exploitation of mineral raw materials leads to degradation of natural resources and the landscape and may affect the quality of soil, water, etc.

Trend and Current State

In the period 2004-2008 exploitation of mineral raw materials showed an upward tendency, except in oil extraction. The highest increase was recorded in exploitation of building stone (by 35%) and building sand and gravel (by 39%). Compared to 2008, amounts of building stone decreased in 2009 from 16.2 million m³ to 13.8 million m³, while the amounts of building sand and gravel decreased from 4.8 million m³ to 3.6 million m³. Amounts of architectural structural stone exploited are slightly lower (by 7 700 m³) and a considerable decrease was recorded in brick clay (by 528 000 m³). Exploitation of raw materials used for cement production saw the largest drop from 4.9 million tonnes to some 1.9 million tonnes. Oil and gas extraction also declined compared to 2008, which is attributable to lower deposit reserves and the level of technology applied for exploitation. Generally speaking, a downward tendency in exploitation of raw materials may be explained both by increasing impoverishment of natural resources and global recession that affects industry, especially the construction industry which is the

main consumer of exploited mineral raw materials in the country.

Extraction of mineral raw materials

Non-metallic raw materials	2004	2005	2006	2007	2008	2009
Building stone (10 ³ m ³)	12 027	11 140	12 369	14 521	16 235	13 821
Building sand and gravel (10 ³ m ³)	3 492	3 438	4 453	4 540	4 856	3 590
Architectural structural stone (10 ³ m ³)	76,3	81,4	71,3	79	89,4	81,7
Brick clay (10 ³ m ³)	1 565	1 150	1 277	1 191	1 291	763
Oil (10 ³ m ³)	803	746	729	702	653	619
Gas (10 ⁶ m ³)	2 352	2 432	2 837	3 001	2 847	2 819
Raw materials for cement production (10 ³ t)	4 697	5 159	5 424	5 533	4 963	1 865

Source of data: MELE



TOURISM

Foreign vessels on cruise in the Republic of Croatia

Foreign vessels on cruise in the Republic of Croatia are a segment of attractive tourist offer. However, this kind of tourism may have a considerable impact on the marine and coastal ecosystem, unless enough attention is paid to disposal of waste and wastewater, control and ban on ecotoxic biocidal coatings applied to shell plating, and monitoring of possible input of alien invasive species.

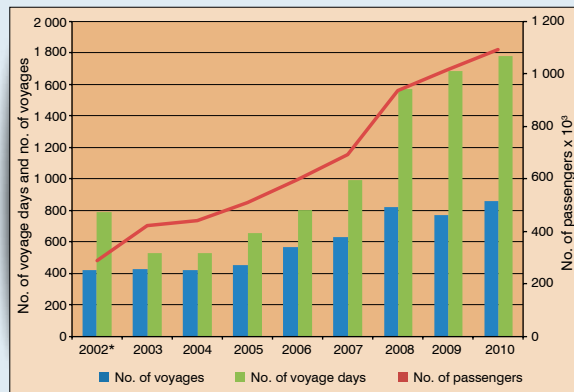
Trend and Current State

A multitude of islands, indentedness of the coastline and a number of sights to be seen in coastal places and towns of Croatia are reasons for a dynamic growth of this kind of tourism. The number of passengers cruising on foreign vessels around the Croatian Adriatic is ever increasing, with a sharp jump in the number of voyage days recorded in recent years. The number of voyages in 2010 increased considerably by 11% compared to the previous year and the number of voyage days by 6%. In the same period the number of passengers increased by 7.5%. This upward tendency of all indicators must by all means be accompanied by measures that will define the development of this kind of tourism in accordance with the principles of sustainable development and the protection of

* Data have been statistically monitored since 2002.

marine environment. During 2010 Dubrovnik, Korčula, Hvar, Split, Šibenik, Zadar and Pula were the main destinations.

Foreign vessels on cruise in the Republic of Croatia



Source of data: CBS



TOURISM

Trends in Registered Tourist Traffic

Besides providing information on trends in tourist arrivals and overnight stays in Croatia, this indicator points also to environmental load caused by tourists that arrive and stay in the country. Environmental pressure is especially noticeable in the coastal area during summer months.

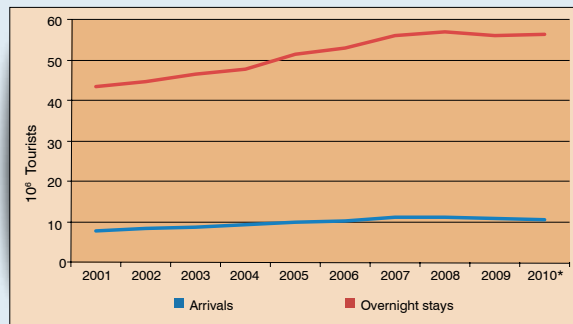
Trend and Current State

In the period 2001-2008 the annual growth rate of the number of tourist arrivals was 5.3% and of overnight stays 4%, which was followed by a slight drop. According to preliminary data of CBS for 2010*, the number of arrivals was by 5.8% lower compared to tourist arrivals in 2008 and the number of overnight stays by 1.2%. Loads caused by tourism to all environmental components are manifested in increased consumption of energy, drinking water and amounts of municipal waste and municipal wastewater, including increased traffic-related emissions into the air which is especially noticeable in the coastal area during summer months. The problem of responsible disposal of waste generated by tourists, especially on islands, and the disposal of municipal wastewater on the mainland and in ports has not been solved in full yet. In recent years tourist services staff have been systematically and regularly educated in the development of environmentally friendly tourism, and

* Preliminary data of CBS

tourists regularly informed about the importance of environmental protection, especially against fires

Registered tourist arrivals and overnight stays in Croatia



Source of data: CBS



FISHERIES

Status of Marine Organisms Stocks

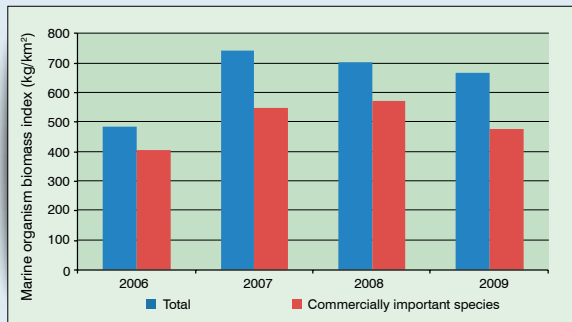


Biomass represents a quantitative evaluation of organisms in a specific area and shows productivity of that area. A biomass index trend is an indication of biological stock trends for individual types of marine organisms and is used to monitor a proper and sustainable management of biological stocks of marine organisms.

Trend and Current State

The overview of biomass index trends is based on data collected in the Croatian territorial sea and the analysis covers the entire territorial sea and individual fishing zones (A, B, C, D, E, F and G). In 2009, total biomass index and biomass index for the commercially important species (hornet and musky octopus, hake, surmullet, sea bream and scampi) decreased in all fishing zones of the Croatia's fishing sea, except in canal areas of the Northern Adriatic (fishing zones E and F). In those Northern Adriatic areas the biomass index was higher compared to the previous year, as a result of increased biomass index for small oily fish and commercially less important benthic species. Of commercially important species only the scampi biomass index was higher than in the previous year, primarily because it increased in the canal areas of the Northern Adriatic. Generally speaking, the status of benthic communities is less favourable compared to the previous year, which is primarily a consequence of the decrease in biomass index in the open sea (fishing zones A, B, C and D).

Index trends for marine organism biomass in the Croatian territorial sea





TRANSPORT

Fuel Consumption and Number of Registered Vehicles



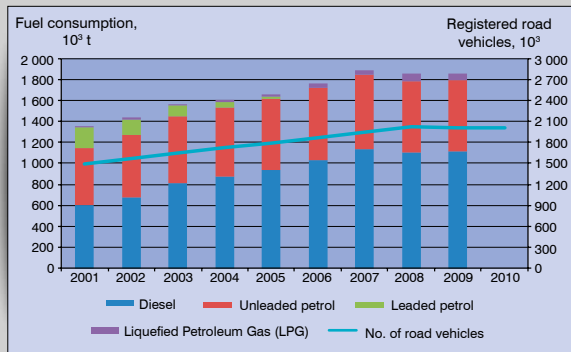
Transport affects the environment directly by releasing harmful substances into the air and water and indirectly by depleting natural resources. The fuel quality improvement (the use of leaded petrol was banned in 2006) and the vehicle fleet upgrade resulted in lower emissions of air pollutants.

Trend and Current State

In the period observed the upward tendency of the number of registered vehicles in the Republic of Croatia and fuel consumption in road transport was stopped. Considering the types of fuel, diesel fuels and unleaded petrol have the largest share in fuel consumption. Their consumption kept growing until 2007, but has been showing a downward tendency since then. In the period observed the LPG consumption was increasing continuously at an annual rate of 24.7%, but here it should be noted that LPG accounts for only 3.8% (2009) of total fuel consumption.

Although the majority of road vehicles are petrol engine driven, consumption rates are the highest for ecologically most unfavourable diesel fuel. This is due to the fact that buses and trucks are driven mostly by high capacity diesel engines and that diesel fuel is also used for agricultural and building machinery. The number of hybrid vehicles is growing, but is still negligible. The number of registered hybrid vehicles was 83 in 2008 and 183 in 2010.

Fuel consumption in road transport and number of registered road vehicles



Source of data: EIH/CBS/MI



TRANSPORT

Public Passenger Transport



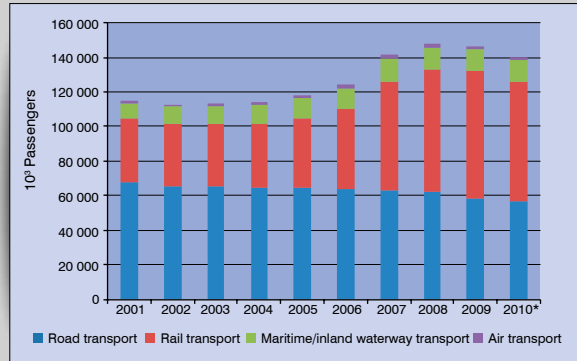
The use of public transport is one of the measures to improve air quality and reduce greenhouse gas emissions. Monitoring of passenger transport parameters in rail, road (passenger cars and buses), maritime, inland waterway and air transport is of utmost importance for the analysis of environmental impacts of transport.

Trend and Current State

Since 2008 the total number of passengers conveyed by all kinds of public transport has been declining. In terms of the kinds of transport, the number of passengers using the road transport in the period 2001 – 2009 kept decreasing slightly but continuously. So, for example, the number of passengers transported in 2010 was by 15% lower than in 2005.

By the end of 2009, rail transport has seen a considerable increase in the number of passengers transported, as a result of stronger inclusion of rail transport into public passenger transport and partly of changed methodology used by CBS for processing the data collected. Nevertheless, in 2010 a 6% decrease was recorded compared to the previous year. From 2008 to 2010 there was a downward tendency in the number of passengers in maritime and inland waterway (by 2.8%) and air transport (by 25%).

Total annual passenger transport by public means of transportation



Source of data: CBS

* Preliminary data of CBS



HEALTH AND SAFETY

Drinking Water Safety Control

About 80% of the population is supplied with drinking water by public water supply systems in the Republic of Croatia, with considerable regional variations. With the aim to protect consumers health, drinking water undergoes permanent quality control carried out by public health services, sanitary inspectorate and accredited laboratories, and is monitored in accordance with prescribed provisions⁹.

Trend and Current State

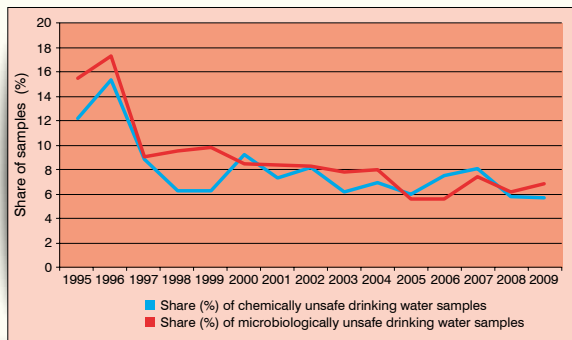
With respect to microbiological and chemical parameters, there is a downward tendency of the share of drinking water samples found to be unsafe taken from public water supply facilities. Since 1997 their individual share in the total number of samples tested has been lower than 10%. The most frequent cause of drinking water samples found to be unsafe with respect to microbiological parameters is associated with unsatisfactory hygienic conditions in the water supply system, resulting from the presence of heterotrophic and total coliform bacteria. Given the chemical test results, the most often reasons for drinking water samples found to be unsafe is increased concentration of ammonia, nitrate, iron and manganese levels, which is mostly a consequence of natural mineral composition of raw water.

There are considerable differences between counties, both in terms of drinking water quality and the level of supply from public water supply systems. In the period 2005 – 2009, the lower share of drinking water samples found to be unsafe as regards chemi-

⁹ Ordinance on Drinking Water Safety Control (OG 47/08)

cal and microbiological parameters was recorded in the Ličko-Senjska, Međimurska and Istarska County, and the highest in the Vukovarsko-Srijemska County. The highest level of drinking water supply was recorded in the Primorsko-Goranska County (about 97%) and the lowest in the Bjelovarsko-Bilogorska County (about 34%). On the whole, the drinking water safety from public supply systems is satisfactory.

Drinking water safety control



Source of data: CNIPH



HEALTH AND SAFETY

Vector-Borne Diseases

Infectious diseases that are transmitted to humans by a third organism, the so-called vectors (mosquitoes, ticks, flies, lice, etc.) are called vector-borne diseases. Their seasonal character and specific geographical distribution are determined by the biological life cycle of the vector (e.g. the incidence of tick-borne diseases increases in spring and summer when ticks tend to be most active). Besides, the climate (temperature and moisture) has a direct impact on the distribution and density of vectors and on increase of their disease transmission potential.

Trend and Current State

Thanks to systematic measures (disinsectisation) taken to control some vectors (mosquitoes and phlebotoms) and to preventive vaccination of persons who frequently stay out of doors (forest workers, hunters, farmers, mountaineers) against viral tick-borne meningoencephalitis (TBME), the state of vector-borne diseases in the Republic of Croatia is favourable and under control. While TBME is systematically kept on a low level by vaccination, in case of Lyme boreliosis, as the most frequent vector-borne disease, protection by vaccination is not possible. Still, there is an effective way of treatment that prevents serious generalized forms of this disease. Leishmaniasis occurs sporadically and Mediterranean spotted fever is very rare. There has never been a case of Chikungunya fever and the last case of autochthonous malaria was documented in

* *Murine typhus*

** *Dengue fever*

*** *Ehrlichiosis*

1954. In 2010 three cases of human ehrlichiosis were recorded, a bacterial disease transmitted by tick bites (caused by several species of bacteria of the genus *Ehrlichia*). In the southern coastal area of the Republic of Croatia the autochthonous Dengue fever (typical to tropical and subtropical areas) transmitted by mosquitoes of the species *Aedes albopictus* (tiger mosquito) was recorded for the first time. In order to prevent the spread of this disease it is necessary to continue taking all legally determined measures of combating mosquitoes and phlebotoms and educating the population.

Number of persons fallen ill with vector-borne diseases

Vector-borne disease	2005	2006	2007	2008	2009	2010
Lyme boreliosis	220	301	266	438	433	492
TBME	28	20	11	20	44	36
Autochthonous malaria	0	0	0	0	0	0
Leishmaniasis	2	2	7	5	2	3
Chikungunya	0	0	0	0	0	0
Mediterranean spotted fever	1	1	4	2	1	0
Other vector-borne diseases	1*	0	0	0	0	1**+3***
Total	252	324	288	465	480	535



GENERAL ENVIRONMENTAL ISSUES

Environmental Protection Programmes



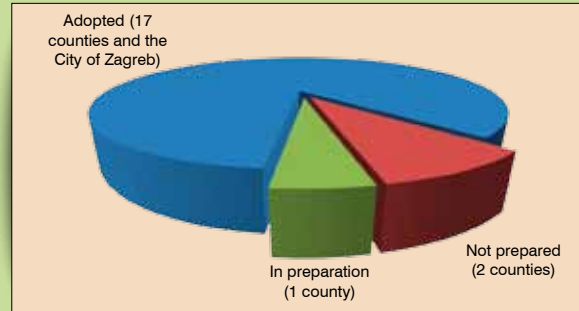
An environmental protection programme, as one of documents governing environmental protection and sustainable development, lays down measures and presents plans for conservation of the environment and environmental protection improvement in line with regional and local specific qualities and characteristics. It is based on objectives and measures contained in strategic documents on the national level. Environmental protection programmes are approved by the MEPPPC and adopted by representative bodies of the counties, the City of Zagreb and major towns in accordance with legal obligations¹⁰.

Trend and Current State

An environmental protection programme specifies environmental protection requirements and measures, priority measures for environmental protection by environmental components and individual spatial units, entities obliged to implement measures and exercise powers relating to implementation of certain measures, state of the environment monitoring and evaluation of the need to establish a network for additional monitoring of the state of the environment, the method of implementing emergency measures in case of environmental pollution, timeframes for implementation of individual measures, sources of finance for implementation of measures and estimate of financial resources required. Unlike 2005 when only 12 counties prepared environmental protection programmes, by the end of 2010 such programmes were adopted by 17 counties, the City of Zagreb and two major towns. The programme is in the

process of preparation in one county and is still not adopted by 2 counties and 20 major towns. Integrated documents and all data about the documents and their authors may be found in the Database of Sustainable Development and Environmental Protection Documents maintained by CEA.

Status of environmental protection programmes by counties and the City of Zagreb, 2010



Source of data: CEA

¹⁰ Environmental Protection Act (OG 110/07)



PUBLIC RELATIONS

Number and Breakdown of Public Inquiries Addressed to the Croatian Environment Agency, 2006-2010

Communication with the general public is one of the fundamental tasks of the Croatian Environment Agency. All information, data, databases, reports and documents are therefore placed on the website of the CEA in order to be publicly available. At the same time all inquiries received are promptly answered.

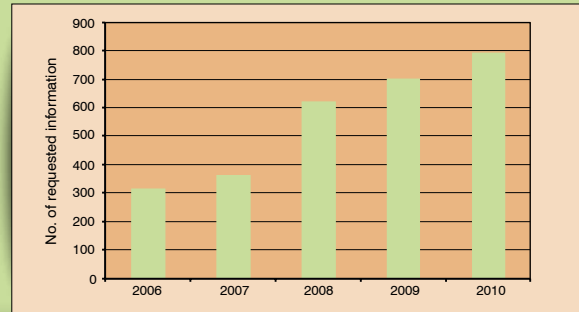
Trend and Current State

During five years, the Agency received 2 141 requests for a total of 2 803 number of information. The majority of inquiries related to waste issues (47%) and were received from private companies (52.6%) dealing with waste handling. The reason for additional increase in the number of inquiries sent by the professional and general public lies in the fact that the Agency has assumed in full the obligation of reporting on this area. Requests for information from databases show a constant upward tendency (a total of 9.3%) and the interest in general issues (5.8%), air/climate (5.6%) and water/sea (4.4%) remains almost equal. Public interest in the areas of soil (1.7%), nature (1.1%) and data on sectoral pressures (1.3%) is the lowest.

During the last three years the Agency recorded increased interest in the Environmental Pollution Registry (EPR), especially from the business sector (entities obliged to submit data for inclusion in the database). In this period 30.5% of all inquiries related to the EPR. According to the structure of applicants, the number of inquiries sent by citizens increased markedly, especially in 2010 which has seen a rise of 140% compared to the previous year. In the period observed, local self-government units accounted for 7.7%, foreign

institutions and companies for 6.5%, the scientific community for 4.5%, state-owned companies for 4% and ministries for 3.4% of the total number of enquiries. In five years civil society organizations sent only 37 inquiries (1.7%). The share of schools and health care institutions in the number of inquiries (1.8%) is approximately the same as that of public institutions (1.5%). Participants in various projects had the lowest share in the total number of inquiries received (0.8%).

Number of information requested by inquiries addressed to the CEA





THE ENVIRONMENT IN YOUR POCKET

Abbreviations



ABP – Animal by-products

CAA – Croatian Agricultural Agency

CBS – Central Bureau of Statistics

CEA – Croatian Environment Agency

CH₄ – Methane

CMAC – Croatian Mine Action Centre

CNIPH – Croatian National Institute of Public Health

CO₂ – Carbon dioxide

CSO – Civil society organization

EE waste – Electrical and electronic waste

EIPH – Energy Institute Hrvoje Požar

EPEEF – Environmental Protection and Energy Efficiency Fund

EPR – Environmental Pollution Registry

FAO – Food and Agriculture Organization of the United Nations

FU – Farming unit

Gg – Gigagram (10⁹ g)

GWh – Gigawatt hour (10⁹ Wh)

HFC – Hydrofluorocarbon

IOF – Institute of Oceanography and Fisheries

LPG – Liquefied Petroleum Gas

LRTAP – Long Range Transboundary Air Pollution

LSGU – Local self-government Unit

MAFRD – Ministry of Agriculture, Fisheries and Rural Development

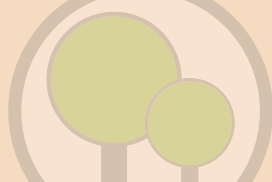
MELE – Ministry of Economy, Labour and Entrepreneurship

MEPPPC – Ministry of Environmental Protection, Physical



THE ENVIRONMENT IN YOUR POCKET

Abbreviations



Planning and Construction

UZFA – University of Zagreb Faculty of Agriculture

MI – Ministry of Interior

NIR – National Inventory Report

N₂O – Nitrous oxide

PAAFRD – Paying Agency for Agriculture, Fisheries and Rural Development

PFC – Perfluorocarbon

PJ – Petajoule (10¹⁵ J)

PM_{2.5} – Particulate matter less than 2.5 μm in diameter

SF₆ – Sulfur hexafluoride

SINP – State Institute for Nature Protection

TBME – Tick-borne Meningoencephalitis

UNFCCC – United Nations Framework Convention on Climate Change



THE ENVIRONMENT IN YOUR POCKET

Glossary



Acidification – A common name for processes that lead to the buildup of hydrogen cations in the soil. This results in the loss of alkaline ions (calcium and magnesium in the first place). Anthropogenetic acidification is caused by acid rains and excessive use of mineral and organic fertilizers.

Algal bloom – A rapid growth and increase in the population of phytoplankton under specific conditions that cause discolouration of the sea water. The colours observed are red, green or brown.

Animal by-products – Whole animal carcasses or parts of animal carcasses and products of animal origin not intended for human consumption, including eggs, embryos and semen.

Animal-by products collection facilities – Facilities used for temporary storage of unprocessed ABPs and, if necessary, for skinning, post mortem examination, sorting, dissecting, cooling or freezing.

Biochemical oxygen demand over a 5-day period (BOD₅) – A method for determining the level of biochemical processes occurring in water, i.e. the amount of oxygen required by aerobic micro-organisms to decompose the organic matter. The more organic matter in water, the more micro-organisms that use oxygen for biochemical processes. BOD is used as a measure of the degree of water pollution by organic matter.

Biomass – A quantitative evaluation of organisms in a gi-

ven area (e.g. total mass of all individuals of a species per unit area or habitat volume), indicating the productivity of the given area.

Clear cutting – A practice in which all or almost all trees in an area of non-rejuvenated forest stock not intended for a change in the forest land purpose are uniformly cut down.

Deforestation – Clear-cutting of forests where forests and forest land are thereafter converted to a non-forest use or used for purposes in line with physical planning documents.

Emergency case – A situation caused by actions or impacts that are out of control, pose immediate threat to human health and life, and, if extensive, can cause damage to the environment.

Emission – A discharge of liquid, gaseous or solid substances and/or release of energy (heat, radiation, noise, vibration, light) and organisms from a source into the environment as a result of human activities, and microbiological pollution of the environment.

Endemics – Taxa whose spread is restricted to a specific area and are not found elsewhere.

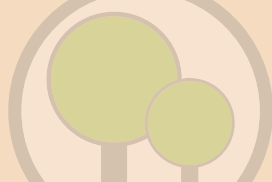
Energy conversion – Any conversion of one type of energy into another (e.g. converting solar energy into electricity).

Equivalent carbon dioxide emission (CO₂-eq) – Greenhouse gas emission expressed as equivalent carbon



THE ENVIRONMENT IN YOUR POCKET

Glossary



dioxide emission (CO_2 eq) and calculated by multiplying the mass and greenhouse potential of each individual greenhouse gas.

Erosion – A natural process whereby the soil, mud, stone etc. are moved by wind, water or movements caused by the force of gravity.

Eutrophication – A process by which an ecosystem is enriched with nutrients which favour the growth of primary producers of organic substances (growth of algae and other plants).

Final demand electricity consumption – Supply of an energy product to industry, transport, households, services, agriculture and construction for power purposes.

Forest stand – An area of forest that is relatively homogeneous with regard to composition and structure, and differs from other areas of the forest in one or more vital characteristics.

Fossil fuels – Fuels formed from organic remains of plants and/or animals (oil, natural gas, coal and peat). Presently they represent the major source of energy on the Earth.

Glaciation or ice age – An interval of time during geological history characterized by glaciated continents, formation of glaciers and an abrupt and sharp drop in temperature.

Greenhouse potential – A measure of impact of a particular gas on greenhouse effect relative to that of CO_2 taken as

a reference value by mutual agreement.

Hazardous waste – Waste that is determined by categories and its composition; it must always contain one or more properties (e.g. explosiveness, inflammability, toxicity) as determined in the list of hazardous waste according to the Regulation on Categories, Types and Classification of Waste with a Waste Catalogue and List of Hazardous Waste (OG 50/05, 39/9).

Hydrology – The scientific study of waters in the atmosphere, over and beneath the Earth's surface, the occurrence, movement and distribution of waters in time and space; biological, chemical and physical properties of water and its effects on the environment and humans.

Illegal landfill – A landfill that is not prescribed by physical planning documents and doesn't possess special permit or authorisation from a local self-government unit.

Landfill remediation – A set of prescribed measures and/or activities intended to restore or substitute the state of the environment that existed before waste disposal or environmental pollution occurred. A landfill can be remedied:

- by closing the landfill and removing the waste completely;
- by closing and remedying the landfill in the manner that minimizes adverse environmental effects of the waste, but the waste remains on site, and
- in the manner that minimizes adverse environmental



THE ENVIRONMENT IN YOUR POCKET

Glossary



effects of the waste, but the landfill remains active and waste is landfilled in a sanitary manner.

List of monitoring stations at which the phytoplankton was monitored in 2009:

OC 1	Dubrovnik
OC 2	Bistrina
OC 3	Ploče (port)
OC 5	Splitska vrata
OC 5a	Stončica
OC 6	Bay of Kaštela (central station)
OC 7	Vranjic
OC 9	Sibenik (bay)
OC 10	Sibenik (St Ante Channel)
OC 12	Zadar
OC 14	Crikvenica
OC 16	Bay of Rijeka
OC 17	Kvarner
OC 18	Rovinj
OC 19	5 Nm ahead of Rovinj

Nautical tourism – A specific form of tourism combining the living of boaters in or outside marinas and the use of vessels and other facilities associated with nautical tourism for recreational, sport, entertainment and other purposes.

Non-energetic use of energy – Use of an energy form for other purposes (e.g. use of natural gas in the fertilizer production).

Official landfills – All landfills that meet some of the following criteria:

- they are included in physical planning documents;
- they have obtained a permit, a ruling and/or a decision of competent authorities, or the obtainment procedure has started;
- they operate with the understanding of or in agreement with competent local self-government bodies.

Passenger kilometre (pkm) – A unit of measure indicating transport of a passenger across a distance of one kilometre.

Phlebotoms – Insects belonging to the family Phlebotomi-neae; they are vectors in transmission of parasites of the genus *Leshmania* from dogs to humans

Phytoplankton – The photosynthetic plankton and primary producers of aquatic ecosystems comprising mainly diatoms inhabiting marine and freshwater ecosystems. The most important groups of marine phytoplankton include monocellular algae such as diatoms Diatomeae and flagellate protists Dinoflagellatae.

Piezometric drill holes – Specially equipped drill holes used for determination of groundwater levels and the study of their movement.

Plankton – A group of monocellular and multicellular organisms that inhabit bodies of water and float drifted by currents. Plankton are the first and essential link in a food



THE ENVIRONMENT IN YOUR POCKET

Glossary



chain of the marine ecosystem and most of freshwater systems.

Polluter pays principle – The costs of environmental pollution remediation should be covered by the party responsible for causing that pollution.

Pre-treatment of wastewater – Application of activities and procedures to remove coarse, dispersed and floating solids from wastewater.

Primary energy – Energy embodied in natural resources that has not undergone any conversion, no matter whether it is a chemical potential of fossil fuels, wood or biomass, nuclear energy, kinetic energy of wind, potential energy of watercourses and thermal energy of geothermal springs.

Primary wastewater treatment – Treatment of urban wastewater by a physical and/or chemical process involving settlement of suspended solids, or other processes in which the BOD₅ of the incoming waste water is reduced by at least 20 %⁵ before discharge and the total suspended solids of the incoming wastewater are reduced by at least 50 %;

Producer responsibility principle – A concept that a manufacturer of a product from which waste originates bears responsibility for the selection of the most environmentally friendly solution according to product properties and production technology, including the lifecycle of the product and use of the best available technology.

Regional organization of the Republic of Croatia – Counties – Numerical identification and regional organization stipulated by the Act of Territories of Counties, Cities, Towns and Municipalities in the Republic of Croatia (OG 86/06):

- I. Zagrebačka County based in the City of Zagreb,
- II. Krapinsko-Zagorska County based in Krapina
- III. Sisačko-Moslavačka County based in Sisak
- IV. Karlovačka County based in Karlovac
- V. Varaždinska County based in Varaždin
- VI. Koprivničko-Križevačka County based in Koprivnica
- VII. Bjelovarsko-Bilogorska County based in Bjelovar
- VIII. Primorsko-Goranska County based in Rijeka
- IX. Ličko-Senjska County based in Gospić
- X. Virovitičko-Podravska County based in Virovitica
- XI. Požeško-Slavonska County based in Požega
- XII. Brodsko-Posavska County based in Slavonski Brod
- XIII. Zadarska County based in Zadar
- XIV. Osječko-Baranjska County based in Osijek
- XV. Sibiensko-Kninska County based in Sibenik
- XVI. Vukovarsko-Srijemska County based in Vukovar
- XVII. Splitsko-Dalmatinska County based in Split
- XVIII. Istarska County based in Pazin
- XIX. Dubrovačko-Neretvanska County based in Dubrovnik
- XX. Međimurska County based in Čakovec
- XXI. City of Zagreb: the capital of the Republic of Croatia is a separate territorial and administrative unit whose organization is governed by the Act on the City of Zagreb.



THE ENVIRONMENT IN YOUR POCKET

Glossary



The identification number (XXI) is used to facilitate data presentation.

Renewable energy sources – Energy sources that will not run out as a result of power generation processes, and include sunlight, wind, hydropower and geothermal energy.

Secondary wastewater treatment – The second stage of urban wastewater treatment commonly carried out by biological treatment and secondary sedimentation, thus removing up to 70-90% BOD₅ and 75% COD of inlet wastewater.

Sink – A process, activity or mechanism that removes greenhouse gases, aerosols or greenhouse gas precursors from the atmosphere, e.g. plants by photosynthesis.

Stenoendemic – An endemic whose distribution is restricted to a very small area, solely within Croatian borders.

Stock – A group of organisms, all of the same species, that is genetically self-sustaining, inhabits a certain geographical area and hardly ever mixes with individuals from other areas.

Sustainable management – A management method by which a balance is achieved between economy and environmental protection with the aim to preserve the Earth's assets for future generations.

Tertiary relicts – Taxa that represent highly valuable re-

mnants of mostly extinct flora or fauna from the Ice Age.

Tertiary wastewater treatment – The final stage of municipal wastewater treatment that follows secondary treatment processes and additionally removes phosphorus by 80% and/or nitrogen by 70-80%.

Urban wastewater – Wastewater which is the contents of sewage system and consist of sanitary sewage, stormwater or wastewater that is a mixture of sanitary sewer and industrial wastewater and/or stormwater of specific agglomeration.

Vector – In epidemiology, this is any organism that transmits an infectious agent from one host to another, but does not cause a disease by itself. Most commonly known vectors are arthropods (flies, mosquitoes, ticks) but may also be mammals (e.g. bats).

Waste management – A set of activities, decisions and measures focused on the prevention of waste generation, reduction of waste amounts and/or its adverse effects on the environment; on the collection, transport, recovery, disposal and other activities relating to waste; on the supervision over these activities as well as after-care for closed down landfills.

Waste recovery – Any operation of reprocessing of waste in order for it to be used for material or energy purposes.

The background of the entire page is a repeating pattern of various environmental icons. These icons are contained within circular frames and include symbols for water (waves, fish), air (flame, swirl), land (trees, hills), and nature (leaves, clouds). The icons are rendered in shades of green and white against a dark green background.

THE ENVIRONMENT IN YOUR POCKET I - 2011