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INTER-RELATIONS BETWEEN ENVIRONMENTAL PROTECTION AND SOCIAL ASPECTS OF SUSTAINABLE DEVELOPMENT (poverty, health, and education)¹

I. Introductory considerations

The concept of sustainable development implies harmonization of a series of diverse sector interests and priorities. It implies the need to reflect on the desired quality and realistic speed of social development, and the need to balance different social values. Sustainability in this context requires harmonization of economic growth and development with the interests related to environmental protection and social development with a “humane face”. In this context, economic sustainability is the necessary, but not the sufficient, precondition of achieving the principles of sustainable.

As the title itself indicates, this paper is diverse in its structure. In line with the intentions, its focus is multiple. Apart from presenting a summary overview of the status of environmental protection in its first section, the paper also covers a series of specific health care and education issues which are related to environmental considerations, as well as the relations between the problems of poverty and environment in Serbia. Each section of the paper ends with a list of open issues, which may be used as guidelines for additional elaboration of the inter-relations between environmental protection and social aspects of sustainable development.

In the context of developing the Serbian Strategy of Sustainable Development, there are two distinct disadvantages. One of these is the almost complete lack of multi-disciplinary research approach, or lack of effective analytical links between environmental protection issues, health care and education issues, as well as poverty issues, and that is the focus of this paper. Much like the lack of multi-disciplinary approach accompanies the research and scientific process in this field, the operating practice of reference institutions at all levels lacks inter-sectoral cooperation. So issues which are inter-dependent or at least inter-related are “resolved” separately, which often leads to resolving the issue in one sector, accompanied with its occurrence in a new form in some other sector².

The other disadvantage refers to availability of data, which should not be assessed only as bad, but as a reason for concern. When they are available, the data are often outdated, collected without continuity, and often available only for the total population

¹ This text resulted as a part of the process within the work on the Serbian Strategy of Sustainable Development. Its primary purpose is to be used for discussion by working groups developing this Strategy, and the focus is on inter-relations between the social aspects of sustainable development and environmental protection, or the links between environmental protection, on the one hand, and education and health, as well as the phenomenon of poverty, on the other. In line with the requirements of the client, the principal materials used for the preparation of this paper are the existing strategy documents of the republic of Serbia. Wherever possible, other available sources were used as well.

² See the text box regarding waste disposal regulations and the position of Roma living on collection of secondary raw materials.

at the republic level. This makes trend analysis difficult, and this applies also to studies at the level of smaller geographical units/regions, or studies by specific demographic or socio-economic characteristics of the population. There are few papers of strategic character whose development was preceded by collection of primary data and identification of the actual situation.

II. Status of the environment in Serbia³

The overall status of the environment in Serbia is unsatisfactory. This refers equally to the status of water and water resources, status of air, bio-diversity, forests and soil. The approach to waste and chemicals management is inadequate, there is a high risk of chemical accidents, and a high level of noise and pollution from ionizing and non-ionizing radiation. Activities of numerous sectors of the economy contribute additionally to environmental degradation in Serbia.

In respect to environmental protection policy, the problems are as follows: inadequate links between environmental protection policy and other sector policies; lack of institutional capacity to respond to existing problems; inefficient environmental monitoring and reporting system; insufficient and inadequate regulation, and lack of efficiency in enforcing existing regulations; low level of investments in this field and lack of economic incentives; and low level of environmental awareness. The National Environmental Strategy (NES) in its recommendations placed emphasis on the needs for improvement in these areas.

The preliminary assessments included in the National Environmental Strategy paper indicate that environmental degradation causes annual expenditures for the Serbian economy ranging from 4.4% (conservative scenario) to 13.1% (maximum scenario) of the GDP for the year 2005. It assessed that the greatest share of this is caused by air pollution (53% of total expenditures), water pollution (22% of total expenditures) and waste management (11% of total expenditures). On the other hand, with the projected economic growth of 5% annually, the share of environmental investment expenditures in the GDP should increase from 0.1% in 2005 to 1.2% in 2009 and 2.4% in 2014. In other words, the level of environmental degradation by far exceeds the level of investment expenditures aimed at improving the status of environment in Serbia⁴.

The National Environmental Strategy for the Republic of Serbia presents the actual situation of environmental protection in Serbia as follows.

Water and water resources. Serbia has sufficient water resources to meet its needs, but only under the assumptions of rational use and protection against pollution.

Somewhat less than 8% of all available surface water originates from within the territory of Serbia, which indicates the need for regional approach of status of water as

³ From the NES paper, 2005.

⁴ It is clear that there is a difference between the accumulation of expenditures caused by environmental pollution, resulting from passivity or non-doing, while the investment in rehabilitation of consequences and promotion of environmental protection requires a more pro-active attitude to preservation for the environment.

a resource and the issues of pollution, primarily in terms of transit water entering the country through the Danube, Sava, Tisa, and other rivers⁵.

Groundwater resources and surface water are used for water supply for households and, according to 1991 data, 80% of the total groundwater resources and 66% of the total surface water resources⁶.

The quality of waters in Serbia is generally low and it is deteriorating. Examples of very clean waters are very rare and are found in mountainous regions, while the majority of water streams are classified as II-III and III category.

The quality of drinking water is also unsatisfactory. According to the findings of the Public Health institute of the republic of Serbia from the year 2001, 29% of samples from water supply systems did not satisfy physical, chemical or bacteriological standards (67% of samples from Vojvodina). There are significant regional differences in the drinking water quality between central Serbia (40% of samples did not meet bacteriological standards) and Vojvodina (problems related to physical and chemical parameters: turbidity, iron, nitrates, arsenic and manganese).

There are 153 public water supply systems serving about 60% of the population, while another 15% of the population has some form of water supply. Many systems are not functioning properly, resulting in unnecessary water losses, and also in inadequate level of service. According to the 2000 UNICEF survey, almost one half of the total population reported regular or sporadic interruption in water supply.

The key sources of water pollution in Serbia are untreated industrial and municipal waste waters⁷, agricultural run-off waters, and pollution caused by river navigation and thermal power plants.

One of the most significant sources of water pollution is inadequate sewerage infrastructure, with the sewerage systems covering only one third of the total population (45% of urban settlements in Vojvodina, 55% in Central Serbia, 85% in Belgrade). Only 13% of collected municipal waste waters are treated before discharge to recipients.

The Sava river basin receives 80% of the industrial waste waters of the country. Only 28% towns in Serbia have municipal and industrial waste water treatment plants, and almost 90% of industrial waste waters are discharged to recipients without treatment. The major towns in the country (Belgrade, Novi Sad and Niš) discharge untreated waste waters.

Lack of incentives for rational water use causes excessive water demand and excessive exploitation of water resources.

Air. Despite the reduced industrial and manufacturing activity in Serbia, the level of air emissions in Serbia is high. Air quality in some parts of Serbia is caused by emissions of sulphur-dioxide, nitrogen oxides, carbon-monoxide, soot, Pm and the like, originating from power generating and industrial facilities (Obrenovac, Lazarevac, Belgrade, Kostolac, Pančevo, Bor, Smederevo, Novi Sad, etc.), as well as combustion in individual boilers, households, traffic, etc.

⁵ So, for example, Serbia participates in all the relevant regional commissions for integrated watershed management for rivers passing through its territory (The Danube commission, the Sava Commission, etc.).

⁶ Water pollution data date back to 1991, and it is believed that pollution has reduced since then due to lower level of operation of industrial facilities. The problem of outdated data is present in all aspects of environmental monitoring

⁷ Due to lack of impermeable lining in waste landfills, most leachate infiltrates ground waters or spills over to surface waters.

Systematic monitoring of air quality is performed through a network of measuring points in the territory of Serbia. Results of measuring during the year 2002 indicate that the average annual value of sulphur-dioxide exceeded the limit values (MAC) in Bor, Smederevo and Kragujevac. Air quality especially deteriorates during the heating season in situations without wind due to high concentrations of soot in the air of urban areas due to emissions from individual boilers and households. The average annual value for soot in 2002 exceeded MAC values in Smederevo, Belgrade, Šabac, Leskovac, Čačak, Pančevo, and some other towns.

Air quality in large cities deteriorates also during hot summer days due to high concentrations of ozone caused by photochemical effects. For example, ozone concentrations in Belgrade were found to exceed MAC values during 20 days (June-August 2001).

The major air pollution results from combustion of low quality lignite (thermal power plants in Obrenovac, Lazarevac and Kostolac) and engine fuel. Lignite burning thermal power plants generate over 5.5 million tons of ash annually. Ash is disposed of inadequately (covering about 1800 hectares), causing uncontrolled secondary emissions, and ash dumpsites are often located close to rivers.

Important sources of air pollution are also refineries in Pančevo and Novi Sad, cement plants in Popovac, Kosjerić and Beočin, and chemical plants and metallurgical complexes in Pančevo, Kruševac, Šabac and Smederevo. The main causes of pollution are obsolete technologies, lack of treatment of waste gases, and low efficiency of air treatment filters, inefficient use of raw materials and energy, bad maintenance etc.

Air pollution from traffic is increasing, and road vehicles are considered a major air polluter in Serbia, the old vehicle fleet, and badly maintained old vehicles and vehicles still using leaded fuel and low quality engine fuels (diesel fuel with high sulphur content). There are no plans to introduce systems of vehicle control in traffic to improve their maintenance or discharge of leaded fuel. Emissions to ambient air of nitrogen oxides and carbon-monoxide in Belgrade regularly exceed allowed limits. Air pollution due to traffic has increased over the past five years due to the import of a significant number of second-hand vehicles.

There is no cadastre of greenhouse gases, nor a national cadastre of air polluters, and the network for monitoring ambient air quality is incomplete. Also, there are no incentive economic measures to reduce emissions to air.

Bio-diversity. The high level of bio-diversity in Serbia is a result of its bio-geographical location, openness of the territory to other regions and the surroundings, and also of historical processes of flora and fauna geneses. For its most part Serbia is located on the Balkan Peninsula, which is one of the centers of bio-diversity in Europe. It is estimated that Serbia hosts about 1000 plant communities. The abundance and diversity of fauna is also high – the total number of mammals, nesting birds, reptiles, amphibian and fish is about 43.3% of the total number of these groups in Europe. In Serbia, about 600 plant species are threatened, and about 500 species of mammals, birds, reptiles, amphibian and fish.

National conservation areas cover about 6.5% of the total territory of Serbia (6 national parks, 98 nature reserves, 16 sites of exceptional scenic features, 296 natural monuments 24 nature parks), and 215 plant and 426 animal species are protected as natural values. A number of nature areas are under protection as sites of international significance (Ludaško jezero, Obedska bara, Stari Begej – Carska bara and Slano Kopovo); Golija-Studenica is recognized as a site according to the Convention on Natural and Cultural Heritage, and there is also a biosphere reserve.

Bio-diversity reduces under the pressures of development of tourism, illegal and unplanned construction, traffic and development of traffic infrastructure and forest activities in protected natural areas. These pressures are the greatest in respect to forest eco-systems and fragile eco-systems.

The system of laws and regulations relevant to bio-diversity is inconsistent and not yet harmonized with the EU directives. There is not yet a national strategy for preservation of bio-diversity, not cadastre records on bio-diversity. Management of protected areas is inadequate, as a consequence of unclear competences, underdeveloped information system, ineffective supervision of economic activities within protected areas.

Forests. The territory of Serbia is characterized by insufficient forest coverage, and a low level of use of existing habitat potentials. A process of global forests drying is under way, accompanied also by illegal logging, forest fires and turning forest land into construction land. In this area, there are no strategic planning documents, the area suffers from inadequate monitoring of forest status, and severe economic conditions have resulted in increased demand for wood related products and services.

More than one fourth of the territory of Serbia is under forests, and forests and forest land represent 28% of its total area. After WWII, one fifth of the territory of Serbia was under forests (19.3%).

The total forest fund of Serbia is 235 million cubic meters, and the current volume increase is estimated at 6 million cubic meters. The average level of logging in Serbia is estimated at about 2.5 million cubic meters, and the level of forestation in 2003 was 3.7 thousand hectares.

According to cadastre records which are not updated and date from 1979, the share of private and state ownership of forests is 50:50. Almost one half of all state owned forests (48%) has primarily a protective function, while the remaining share has a productive function. Of the total territory covered by forests and forest land, 18% is under a special regime or some type of protection (90% of these is state owned).

The status of forests is characterized by an unfavorable structure in terms of origins so, for instance, the share of plantations and low-production privately owned forests exceeds 55%. The high share of low-productivity forests, apart from implications on economic activities, also has the function on absorption of carbon dioxide.

Soil. One of the major causes of soil degradation and its deteriorated quality is the occurrence and progress of erosion processes. Of the total territory of Serbia, excluding Kosovo, two thirds are occupied by agricultural soil (in Vojvodina as high as 83%). It is estimated that erosion processes of various degrees affect up to 80% of agricultural soil in Serbia. Water erosion is typical for central regions and hilly-mountainous regions of Serbia. The predominant type of erosion in Vojvodina is eolic erosion (erosion processes caused by wind), affecting about 85% of agricultural soil.

Soil pollution also results from industrial, mining, agricultural and traffic activities.

Soil quality is also degraded as a consequence of uncontrolled and inadequate waste disposal from industrial complexes (Bor, Pančevo, Novi Sad, Smederevo, Belgrade, Kragujevac). Exploitation of mineral resources, especially in open cast mining, leads to full soil degradation. This is the case in the Kolubara and Kostolac basins, where lignite located under top quality soil is exploited. In this way, about 40,000 hectares of land is degraded. Of this, through natural and artificial recultivation, (so far consisting only of planting greenery) less than 20% has been covered. Great

areas are also covered with tailings, and it is estimated that in the different tailings disposal sites there is between 1.4 and 1.7 million tons of tailings from open cast mining and about 700 million tons of flotation and separation tailings.

Along roads, especially along trunk roads, soil quality is affected by settlement of pollutants from exhaust gases from motor vehicles.

Although uncontrolled and inadequate use of fertilizers and pesticides is more than three times lower in 2002 than in 1991, it is still a problem, and there are no systems for control of water used for irrigation purposes.

In this area as well, there is a lack of adequate laws and by-laws.

Waste, chemicals and risk of chemical accidents

Waste management is inadequate and poses a public health and environmental risk. This refers especially to hazardous waste, which is not collected separately and is disposed without treatment.

About two thirds of total municipal waste in Serbia is collected (2.2 million tons annually). Collection is organized in urban areas and in rural areas garbage is burnt in backyards.

An average person in Serbia generates about 290 kg of waste annually. The majority of municipal waste is generated by households (63%), while enterprises generate about 20% of waste. Disposal to landfills is the principal method of waste disposal. At present there are about 180 officially registered landfills for disposal of municipal waste in Serbia, which do not meet the technical requirements for sanitary landfills (except one in Vranje). There are also hundreds of illegal dump sites in rural areas.

Although primary recycling is prescribed by law in Serbia (segregation of paper, glass and metal), with few exceptions, recycling is not functioning in practice. Also, industrial processing capacity of recycled waste is limited.

There are no reliable data on volumes of hazardous waste generated by industry. It is estimated that in Serbia 460,000 tons of hazardous industrial and medical waste is generated annually. In Vojvodina, there is also a problem relevant to waste from oil rigs.

There is no comprehensive data on *chemicals management* activities, and an initial register of dangerous substances was prepared only in 2000. The legal framework relative to chemicals is narrower in scope than in the EU and is focused mostly on poisons. The Rotterdam and the Stockholm Conventions have not been signed, so no assessment procedures have been introduced for issuing permits based on prior information on the impacts of certain chemicals on public health and environment (PIC procedure), and there is no inventory of Persistent organic Chemicals (POPs).

Chemical accidents, or accidents involving hazardous substances during their production, use, storage, transport and disposal are sources of environmental pollution and a public health hazard. On average, 10 such accidents are recorded in Serbia annually.

Chemical and petrochemical industries create greatest risk of environmental accidents, and many accidents are recorded during the transport of hazardous substances. There is also spillage of oil and chemicals from vessels in navigable waters, but these are not reported regularly.

Noise, ionizing and non-ionizing radiation

Data on *noise levels* in Serbia are limited, as systematic noise monitoring is carried out only in several major towns (Belgrade, Novi Sad, Niš and Subotica). Reliable data on

noise in other locations of industrial facilities, airports and major transport roads are not available. Communal noise originates mostly from traffic, while industry, small-scale business, construction and other activities are of minor significance.

Most major towns in Serbia do not have by-pass roads. Exceptions are Novi Sad, Niš, Subotica, Pančevo, Požarevac and some others, which divert a major share of traffic from city centers. This is not the case in Belgrade.

Vibrations are not subject to regulations.

Of the total number of sources of ionizing radiation in Serbia, 80% are sources used in medical applications, 15% in industry and about 5% in other activities. This area is regulated by law, and technical tasks in the field of protection against ionizing radiation may be performed only by authorized legal persons; monitoring is carried out systematically for the past 40 years, and since 1996 on the basis of a new regulation on systematic testing of the content of radionuclides in the environment. In Serbia there is still unremoved about 1800 sources of ionizing radiation from radioactive lightning protection devices.

The major problem is radioactive waste stored temporarily in the Institute of Nuclear Sciences «Vinča» in two storage facilities, for solid and liquid radioactive waste, and there are also four underground storage tanks for liquid low-radioactive waste. The remaining storage capacity is sufficient for the next four to five years. The storage of radioactive waste does not meet the legal requirements, and radioactive solid waste and liquid waste of low and medium radioactivity is pre-treated.

After the NATO air-raids in 1999, four sites have been identified in the territory of Serbia (excluding Kosovo⁹ which are contaminated by depleted uranium: Bratoselec and Borovac (municipality Bujanovac), Reljan (municipality Preševo) and Pljačkovica (municipality Vranje). Until the end of 2006, the rehabilitation of the last remaining site, in the municipality Preševo, should be finalized⁸.

The field of *non-ionizing radiation* is not regulated by the law, and this makes difficult the resolution of problems occurring over the recent years primarily related to the installation and use of base stations of mobile telephony. Due to lack of legislation, there is also lack of institutions authorized to carry out monitoring on non-ionizing radiation.

Open issues/challenges

- Systematize the existing and collect new data on environmental media as resources, including:
 - The level of availability, use and renewability of resources;
- Introduce systematic monitoring of pollution levels in individual environmental media, including:
 - Monitoring the progress of rehabilitation of existing problems;
 - Make projections regarding environmental pressures;
- Upgrade the environmental legislative framework:
 - Make assessments of time-schedule and funding requirements for implementation of different legal solutions

⁸ The Task Force UNEP/ Habitat za Balkan (UNEP/ Habitat Balkan Task Force (BTF)) developed an evaluation of consequences of air-raids to environment and human settlements in the Balkans, focusing on the most severely affected industrial sites, the Danube river, and damages to bio-diversity in protected regions. See: From Conflict to Sustainable Development, Assessment of Environmental Hot Spots, SAM, April 2004, UNEP.

- Synchronize the sequence of changes in environmental regulations with changes in directly related fields (for instance, the planned introduction of full coverage of water supply and electricity charges should be accompanied with a parallel solution of covering the electricity costs for the poorest population).
- Harmonize the national regulations with those of the EU, taking full account of local conditions, including:
 - Designing a most cost-effective plan of legislative changes with a proposal for transition periods for the most expensive legislative solutions during negotiations with the EU regarding the environment;
- Monitor regularly the effects of environmental pollution on human health, including
 - Health status of the poor and especially sensitive social groups;
- In line with recommendations of the World health organization, develop a National Environmental Health Action Plan (NEHAP);
- Integrate environmental protection contents in the regular education curricula at all levels integrate environmental protection contents;
- Systematically implement information and awareness raising activities relevant to environmental protection in Serbia and relevant to the required changes in behavior in order to achieve a more rational use of available resources and to reduce the level of environmental pollution (including the introduction of economic incentives);
- In line with UN recommendation, implement the objectives of sustainable development in Serbia, and along the institutions at republic level include institutions at local government level (towns and municipalities);
- Having in mind the fact that the level of registered expenditures due to environmental degradation by far exceeds the level of required investments for environmental improvements in Serbia, build consensus regarding continued long-term investment in this field.

III. Inter-relations between poverty and status of the environment

The issues of poverty, much like the issues of sustainable development, are characterized by multi-dimensionality. For this reason, the links and inter-relations between poverty and environmental protection problems are numerous. One of the most obvious is the fact that it is exactly the poorest segments of the population that are most exposed to negative effects of environmental pollution.

The definition of poverty used in the Poverty Reduction Strategy Paper in Serbia (PRSP) includes the right to a healthy environment. Based on the PRSP, poverty implies insufficient income to cover fundamental existential needs, but – based on the human rights based approach to development – also lack of employment opportunities, inadequate housing, inadequate access to social protection, education and utility services, which is of crucial importance for the sensitive and socially insufficiently included groups. Other key aspects of the definition include the right to a health environment and use of natural resources, primarily the right to healthy water and air.

According to survey data from 2002 and 2003, in Serbia there are 10.6% and 10.5% poor respectively living on 2.4 dollars a day. At least another 10% falls in the group which is at risk of “falling into poverty”, which is a group living on 2.9 dollars a day. The biggest number of the poor are unqualified, unemployed and supported, the old and

the children, households with five or more members, old single households and two-member rural households, the regions of south-east and western Serbia. Although the said surveys could not provide full evidence of this, refugees and internally displaced persons, the Roma, and persons with disabilities are disproportionately poorer or exposed to a higher risk of poverty.

In line with the EU policy of social inclusion of sensitive social groups, the right to decent housing and better access to quality public services are some of the key priorities in the process of social inclusion⁹.

Having in mind the complexity of links between poverty and the environment, this paper will limit itself to some aspects of living conditions of the poor, and the impacts of poverty on the status of natural resources and the environment generally.

The environment of the poor – unhealthy environment

There are no systematic data on direct effects of the poor state of the environment on health of the poor in Serbia¹⁰. Yet, the poor live under worse housing conditions and more often have no access to utility services than the «average» population (access to healthy water, electricity, heating, sewerage connection, waste collection, etc.).

Housing. There are three especially sensitive groups of population in Serbia with respect to the right to housing and quality of housing: inhabitants living in unhygienic settlements, refugees and displaced persons in collective centers, and the poor with no safe housing conditions. By far the highest number of persons living in unhygienic settlements are the Roma, whose total number in Serbia is estimated in various ways – ranging from 100,000 to 450,000, depending on the source. The total number of refugees and displaced persons in Serbia is about 470,000, of which about 120,000 are estimated to be poor (not more than 10% lives or had lived in collective centers)¹¹.

It is estimated that about two thirds of Roma live under the most severe conditions and in worst environmental conditions in Serbia¹². About 80% of Roma lives in the poorest regions and settlements, which is the highest share compared to all other ethnic communities in Serbia. A half of all Roma in Serbia do not have access to safe housing (they live in unhygienic settlements or collapsing houses), nor access to quality sanitation (without access to sanitary facilities or sources of water within the settlements)¹³. Just in Belgrade, there are more than 40 registered unhygienic settlements, with houses constructed of cheap materials (cardboard or metal sheets), whose inhabitants in 72% of case are Roma. Such conditions contribute to a higher risk of contagious and other diseases¹⁴, especially having in mind that vaccination has been confirmed for only 55% of the Roma children covered by the survey.

⁹ European Commission, 2005.

¹⁰ According to the survey results for the year 2002, among the poor there are 30.3% of those diagnosed with some chronic disease, compared to 26.6% of those living below the poverty line. Source PRSP, 2003. This information should be “read” with certain reserve, as there are no data on the use of health care services by the poor in comparison to those who are not poor.

¹¹ Report on progress in implementing Millennium Development Goals in Serbia for 2005, Government RS, 2005.

¹² Poverty Reduction Strategy Paper for Serbia, 2003.

¹³ “UNDP Report on Socially Vulnerable Groups in Serbia: poverty and employment among the socially vulnerable groups”, UNDP, 2005.

¹⁴ See also the chapter of this paper dealing with data by Oxfama for 2003, for the Roma population living in unhygienic settlements in Belgrade and Kragujevac.

15% of refugee and socially displaced households do not have access to safe housing. 35% have no adequate sanitation, and there is also the problem of access to water in flats and backyards (10% households)¹⁵.

Access to utility public services. According to the PRSP, based on results of surveys, about 84% of the population of Serbia is connected to the water supply networks and has access to sanitation and drinking water in their housing units. There are significant differences in the coverage of urban (97%) and rural (68%) regions. Despite the relative high coverage, the water supply systems are in a poor state, with frequent outages in water supply. With respect to sewerage, the connection in urban regions is 87.5%, and in rural regions only 22.2%. Rural regions rely primarily on septic tanks, which often are not properly designed and installed. There are also huge regional differences in sanitation services, with 49% of population of Vojvodina connected to the public sewerage systems, compared to 66.9% in Central Serbia, including Belgrade.

On the other hand, most Roma settlements do not even have a legal status and are out of urban systems. So access to utility and public services in Roma settlements is very limited or none. It is estimated that out of the total of about 600 Roma settlements in Serbia, 35% does not have water supply, about 65% does not have sewerage, about 45% does not have regular streets, and about 10% does not have an electricity network¹⁶. There are also contagious diseases related to poor living conditions, such as hepatitis and trachoma.

¹⁵ “UNDP Report on Socially Vulnerable Groups in Serbia: poverty and employment among the socially vulnerable groups”, UNDP, 2005.

¹⁶ Jakšić, B., Bašić, G., 2002: Roma settlements, living conditions and possibilities for integration of Roma in Serbia, Centar za istraživanje etniciteta, OXFAM; according to PRST.

Impact of poverty on the state of natural resources and environmental sustainability

The state of poverty leads to form of behavior exerting direct pressures on the environment. Out of necessity, the poor often excessively use natural resources thereby degrading the status of specific resources, primarily soil and forests.

Degradation results from excessive grazing and excessive use of forest funds. For instance, when prices of energy grow, the poor rural population more often relies on wood for heating.

Although on the decrease, the use of solid fuels (coal and wood) is still high in Serbia, as 40% of households are still heated this way. This source of energy represents about 37% of the total consumption of final energy in Serbia¹⁸.

Transfer of impacts: The Roma situation and waste management¹⁷

Results of surveys conducted by UNDP regarding vulnerable groups in 2004, 6% of Roma and 5% of covered refugees and internally displaced persons stated that they make for living by collecting secondary raw materials. Waste collection is carried out in an unregulated and unorganized manner. The waste is taken out of garbage containers, without any protection, or with health risk; it is sold at low prices. At the same time, in line with the harmonization of the national laws with the EU, the new draft Law on Waste Management introduces certain changes which will have direct impacts on the position of those collecting waste. The Law introduces the obligation of registration, so that unauthorized persons will not have access to scrapped materials storages or landfills. New standards will be introduced for waste storage and sanitary protection, and companies buying recycling materials will be obliged to provide evidence that it comes from legal sources. These regulations will have a significant impact on the said categories of the population.

Open issues

- Systematize the existing and collect new information on housing and access to public services by the poor and vulnerable social groups;
- In line with recommendations of the EU, improve access to safe housing, especially for the poor and vulnerable social groups (social housing, rented public housing, cleaning and regulation of spontaneously developed settlements, resolve the issues of the homeless);
- In line with recommendations of the EU, improve access to utility services, including access to drinking water and sanitation;
- Regularly and separately monitor the effects of environmental pollution on the health status of the poor and vulnerable social groups;
- Establish systems for management of municipal and hazardous waste, keeping in mind the interests of the poor who live on collection of recyclable materials;
- In the context of reforms in water management and the energy sector, primarily with reference to abolishing subsidies for water, electricity and heating prices, maintain the existing and establish new protective mechanisms for the poor and vulnerable social groups¹⁹.

¹⁷ “ UNDP Report on Socially Vulnerable Groups in Serbia: poverty and employment among the socially vulnerable groups ”, UNDP, 2005.

¹⁸ Report on progress in implementing Millennium Development Goals in Serbia for 2005, Government RS, 2005.

¹⁹ The Strategy of Developemnt of the Energy Sector dating from 2004, states that under the conditions of slow economic growth and no increase of living standards of the population, it is necessary for the

IV. Environmental impacts on health

The link between environmental quality and human health is not straightforward, as there are numerous other factors affecting human health. However, of the series of factors affecting human health, the environmental factor ranks high, along with hereditary and individual characteristics, life styles and access to effective and efficient health care services, although social and economic factors should not be neglected either.

Environmental factors of special significance for human health include housing, nutrition, working conditions, safe drinking water supply, adequate waste disposal and control of environmental pollution. Certain environmental conditions are known to correlate well with diseases such as, for instance, asthma or digestive diseases. Pollution of air, contamination of water and food, noise and radiation are the main environmental causes of health degradation.

According to the logic of health care strategy papers, the focus in ranking the national priorities in prevention of diseases and conditions should be on prevention of diseases and conditions, and on reducing the level of early mortality. This should of course take into consideration diseases caused by environmental degradation. At the end of 2005 the draft national health care strategy was developed in Serbia, whose main objectives are health promotion and primary prevention of diseases through actions aimed at health factors. During the process of developing the national health care strategy paper it was determined that there is lack of data regarding the health status of refugees and internally displaced persons, minority populations, the homeless, persons with invalidity and persons with serious diseases. The paper also states explicitly that the state of the environment in Serbia is a specific challenge, and that the state of the working environment is not well documented²⁰. Among the public health priorities, along with food, alcohol, tobacco and women's health, there is also explicitly stated link between the environment and the health status of the population.

Some aspects of the health status of the population of Serbia

One of the well known economic models which refer to calculating expenditures related to environmental degradation suggests the calculation of total social expenditures by expenditures related to the loss of human capital, expenditures of treatment and recovery. In other words, the sum of expenditures of mortality, invalidity and morbidity leads to a composite value of social expenditures caused by environmental pollution. Such calculations have not been made for Serbia, but the data available could be used to illustrate the supposed causal link between the state of the environment and the mentioned health status indicators of the population (the human capital).

This link may be shown by general indicators of the public health such as mortality of infants and children up to five years of age, the average life expectancy, structure of

Government to develop a program to protect the poorest population by direct subsidies covering a portion of costs for energy to be financed out of a special Fund which is proposed to be established (pg. 19). There is need to further develop such ideas from the level of proposals and implement them in parallel with the implementation of the reforms in major sectors, such as the energy sector.

²⁰ Dimitrijevic, Z., (2005), "Public Health in Serbia", in: Bulletin of the Association for Public Health of Serbia, Nr. 1-2/2005.

death causes, and incidence of death and injury at the work place. On the other hand, it will be necessary in the future to establish systematic collection of data concerning diseases directly related to environmental pollution. Apart from the need to continue the work on categorization of diseases related directly to the status of the environment, it is necessary in Serbia to focus on improvement of living conditions in unhygienic settlements because of the determined high epidemiological risk to public health in these settlements and to the overall public health.

General indicators of public health in Serbia

Mortality of infants and children up to five years of age are sensitive indicators of public health. After the continual decrease during the 70-s and 80-s of this indicator, there was a moderate trend of decrease of *infant mortality* with oscillations in years 1993, 1996 and 2000 when this indicator increased. In the year 2002, there were 10.1 stillborn on 1000 liveborn infants. In the old EU member states the infant mortality rate averages 4.9 (1999), and in countries of Central and Eastern Europe its average is 11.3 in 1999 and 10.7 in 2001. *The probability of mortality of children up to 5 years of age* has been decreasing continually since 1990 (from 18.3 to 11.5 per 1000 in the year 2002.). Over the past decade the mortality of children of this age decreased more in central Serbia than in Vojvodina.

The health of vulnerable children populations, such as the Roma, refugees and children living in poverty, is not monitored separately. However, certain studies indicate their higher health vulnerability and poorer access to health care. For instance, the UNICEF study in 2000 indicates that these categories of children were almost twice as often undernourished than children from the average population.

Average life expectancy for 1999/2000 for females was 75.1 in Central Serbia and almost two years less (73.3) in Vojvodina. For males, it was 69.9 in Central Serbia and more than two years less in Vojvodina (67.7). For the period 1989/1990 to 1999/2000, these indicators for male and female infants in Central Serbia practically did not change, while this indicator increased in Vojvodina for both genders. The values of this indicator are higher in Serbia than in countries of Central and Eastern Europe (in 2000, according to the WHO, 73.1), and lower than in old EU members states (78.4, the same source).

Control of communal noise in Belgrade in the year 2005²¹

Noise is a serious cause of complex health disorders. It was believed earlier that it affects only the hearing organs, but it has been established that noise affects the nervous system, central and vegetative one, and through it also the heart, blood vessels, blood pressure, the digestive tract and other organs and tissues in which it causes changes and functional disorders. Research indicates that about 10% of the population has an increased sensitivity to noise.

Belgrade is one of the few towns in which the noise level is monitored regularly at some 30 measuring points. Since 1999, these measurements are fully in line with international standards. Communal noise in Belgrade originates primarily from traffic, and on average the MAC levels are exceeded most often in residential areas. The levels of recorded communal noise are high, and during 2005 in 20 measuring points (two thirds) for day periods and 25 measuring points (almost 85%) for night periods they exceed the prescribed levels.

²¹ «Control of communal noise in 2005» (2005), in: *Ekološki bilten*, December 2005, The Environmental Secretariate of the City of Belgrade.

Structure of causes of death in Serbia. As stated in the PRSP, a high share of cardiovascular and malign diseases in the structure of causes of death in Serbia (over two thirds of all deaths) is an indication of widespread behavior risk factors (smoking, alcohol, inadequate nutrition, low physical activity), and environmental risk factors (contamination of air, food and water).

Analysis of causes of death in Serbia indicates that this structure has not changed during the 90-s. More than one half of the population dies and dies of vascular and cardiovascular diseases (55.8%), malign diseases (17.4%), symptoms, signs and pathological clinical and laboratory findings (8.7%), injuries, poisoning and effects of external factors (4%). Chronic mass diseases (diseases of the heart and blood vessels, malign tumors, diabetes, obstructive pulmonary diseases, mental health disorders, etc.) are for decades dominant factors in the national pathology. Insufficiently documented diseases and states, which rank as third cause, are results of inadequately reported death causes, while inadequate protection at the work place, in traffic and at home are among the major external death factors.

There are no routine health statistics in Serbia on morbidity according to socio-economic status. As the draft National Public Health Strategy states, the leading diseases and injuries are directly related to social and economic health factors, i.e. they are unproportionally present in the poor and vulnerable population, leading to inequality in health in Serbia.

Categories of diseases directly related to the state of the environment

Air pollution is directly related to the lung function (cough, pulmonary tract irritation, accelerated and shallow breathing), inflammations or damages to the lung mucous, worsening of asthma, reduced immunity, etc. Some volatile organic compounds, like benzene, are highly carcinogenous. A highly present pollutant in Serbia is lead, which is used as fuel additive. Babies and young children are especially sensitive even to very low lead concentrations. The effects of lead poisoning include damages to organs (kidneys, liver, brain, etc.), damages o the brain and the nervous system (seizures, mental retardation, behavior disturbances, memory problems, etc.), damages to the heart and the cardiovascular system (high blood pressure, heart failure) etc. So, in Belgrade, the concentration of lead was 5.6 times higher than maximum allowable concentrations.

Inadequate drinking water quality (bacteriological and chemical contamination) may cause disturbances of the digestive system, chronic and infective diseases, while poor quality of surface waters is a threat to public health also when used for recreation purposes – for instance, as bathing water.

Inadequate waste management is a factor of epidemiological risk (especially medical and hazardous waste), contamination of sources of water supply and emissions of carcenogenous dioxins that may result from burning waste in backyards (typical for rural settlements). Equally important are unhygienic housing conditions, primarily lack of access to sewerage network and waste collection.

According to Oxfam data for 2003, *epidemiological risk of infectious diseases in Roma unhygienic settlements* is very high²². Although, for instance, in Belgrade the Institute of Public Health controls the implementation of systematic rodents control in some of these settlements, carries out epidemiological studies and makes proposals of counter-

²² *Health of the Roma population, Evaluation and results of MAS supervision*, Institute of public Health Belgrade, Dr Predrag Kon, Oxfam GB, Belgrade office, 2003.

epidemiological measures in cases of occurrence of infective jaundice, it organizes and controls immunization campaigns – there is no continued supervisions of infectious diseases due to which there are no data on frequency of diseases in these settlements.

As a result of unhygienic housing conditions, lack of access to drinking water, sewerage and waste collection, in the year 2003, the incidence of *intestine infectious diseases* in Roma population was 10 times higher than in the general population of Belgrade. The incidence of *respiratory infections* was about 20% higher in the general than in the Roma population, which could be attributed to the fact that a large number of such infections among the Roma children remains unregistered. Namely, infections of lower respiratory tract are significantly higher in the Roma population. For example, the greatest number of lower respiratory tract infections is registered in the Roma population of New Belgrade, specifically 74% higher than in the general population. *Skin infections* are more than three times more frequent in the Roma than in the general population of Belgrade, and they are a consequence of lack of personal hygiene and lack of access to safe drinking water²³.

There is also a very great difference in the incidence of *undefined infections and unexplained temperatures* (25 times greater than in the general population), as a consequence of lower access to health care by the Roma population than by the general population²⁴.

Working environment as a living environment

The working environment and its quality are rightly seen as an element of the living environment in a broader sense. This is, at the same time one of the rare fields in the domain of social policy and employment that the EU treats at the level of law *Acquis Communautaire*.

According to the statistics available, the number of average annual deaths at the work place over the past three decades in Serbia was 200. The annual number of injuries at the workplace is 27 thousand, meaning 2,200 per month or 75 injuries per day. Serbia has about 400 thousand inability pensioners, representing 31% of the total number of pensioners. There are about 135 thousands of people with serious body disability due to severe working conditions, while at least one thousand per year developed serious or incurable professional illnesses at the workplace.

About 500 thousand work days are lost annually, and one injury means on average about 20 days of absence from work. It is estimated that in Serbia deathly, serious and mild injuries at the work place in 2004 entail expenditures of about Euro 10 million.²⁵

At the end of 2005, a new Law on Public health protection and Safety at Work came into effect, in line with EEC Guidelines 89/391 EEZ. The Law prescribes the introduction of security measures aimed at promoting the safety and health of workers, and refers also to prevention of professional risk (occurrence of injuries at work and professional diseases), obligations to eliminate risk and factors that may lead to accidents, the evaluation, information and consultation of workers on risks that can not be avoided, etc.

²³ Ibid.

²⁴ Ibid.

²⁵ Official statistical data presented at teh Conference “Health Protection and Safety at Work”, Zlatibor 12-14 may 2005. The Trade Unions of Public Services within the Independent Trade Unions of Serbia and Montenegro.

Open issues

- Establish links between mortality, disability and morbidity with risks/factors of the exterior environment and systematically collect data on diseases related directly to environmental pollution, including the working environment;
- Introduce regular monitoring of indicators of mortality, morbidity and disability according to socio-economic characteristics;
- Assess the existing and optimum capacities of health care institutions needed to treat diseases related directly to environmental pollution, including the working environment;
- In line with the recommendations of the World Health Organization, develop the National Environmental and health Care Action Plan (NEHAP);
- Adopt the Public Health Strategy and ensure operationalization and implementation of the seventh general aim identified in the draft Public Health Strategy, including the plans to:
 - Monitor the implementation of EU norms and standards relevant to quality of water, air, soil and food, and the overall health impacts of environmental pollution
 - Achieve environmental improvement through actions directed at health factors
 - Improve the working environment through actions directed at health factors.
- Implement consistently the provisions of the new law on Safety and health at Work, in line with EU standards.

V. Human capital of Serbia and education for sustainable development

As stated in the National Strategy for Accession of Serbia and Montenegro to the EU, expenditures for education or development of the human capital has the character of investment expenditures, making education policy a integral part of the overall development policy of the society. It is characterized by its expressly long-term strategic nature, «and conceptual mistakes in education policy result with deferred but serious consequences, which first become visible in the labor market as an imbalance in supply and demand for specific professions, and which finally become manifest in form of general economic lagging behind²⁶.

Two aspects of education are especially significant in the context of sustainable development. One refers to the current state or the current qualification structure of the population of Serbia, primarily in the sense of increasing the quality of «human capital». The second, somewhat more specific, refers to the list of education profiles and curricula at all levels related to environmental protection. This is of special significance in the current UN Decade of Education for Sustainable, of which Serbia is also a part.

Increasing the quality of human capital in Serbia

There are three aspects of actions that are of special significance for improving the level of qualification and education of the population in Serbia. Above all, the increase of the overall level of education of the population of Serbia, starting from achieving the

²⁶ National Strategy of Serbia for the Accession of Serbia and Montenegro to the EU, Government of the Republic of Serbia, Office for Accession to EU, June 2005, pp. 84.

aim of *de facto* full coverage of children by primary education, as the starting precondition for achieving the higher levels of education. The second aspect refers to the need to establish effective links between the developments in the labor market (or, development needs of the economy) and the structure of education profiles within the education system. Finally, it will be necessary to provide the preconditions for harmonization of the education process with the needs of developing a knowledge-based economy.

Education structure – the available level of «human capital»

Despite the existence of a developed network of primary schools and a several decades of legally prescribed obligation and access to free education at this level, the share of illiterate population above the age of 10 is 3.5%. Almost one fourth of the population above the age of 15 has completed only primary education, and 22% of the same age group does not have completed primary education. The literacy level among the Roma is much worse. According to the population census data from 2002, 62% Roma do not have completed primary school, while 32% have only primary school²⁷.

More than two thirds of the working population has secondary education, and only 10% of the population with secondary education graduated from grammar school²⁸. The share of population with university degree is lower than European average – according to data for 2002, among those above 15 years of age there is only 6.5% of those with university degree. Among the Roma, only 0.3% has college or university degree. Expenditures for education are at a level lower than the average in transition countries.

Harmonization of the demand on the labor market with education profiles

As stated in the National Employment Strategy for the period 2005-2010, privatization, restructuring and modernization of the economy create a new structure of the economy with an increasing importance of trade, traffic, finance, intellectual, personal and other services. Adjustment to these system changes implies not only a reform of education, but also ongoing prequalification programs and additional training of the labor force, especially the unemployed or those at risk of becoming unemployed²⁹.

In the said period, there is need to synchronize reforms in education with the developments in the labor market, on the one side, and the need to promote a concept of life-long learning, on the other. Secondary school education reform cannot be expected to produce quick results. Yet, there is a need, without delay to initiate such adjustments primarily in secondary vocational education³⁰.

Towards a knowledge-based economy

The term «*knowledge-based economy*» denotes a new economic environment in which innovation and knowledge replace capital and labor as primary «factors of production». There are four most frequently emphasized fields decisive for the ability of a country to fully take part in global knowledge-based economy:

- a. *Education and training* (educated and skilled population as the foundation),
- b. *Information infrastructure* (from radio to Internet, for efficient communication, dissemination and processing of data),

²⁷ Poverty Reduction Strategy Paper, 2003.

²⁸ National Employment Strategy 2005-2010, 2005.

²⁹ Ibid.

³⁰ Ibid.

c. *The economic and institutional context* (regulatory and economic framework for free flow of information, investment in ICT and development of entrepreneurship),
d. *Innovation systems* (network of research centers, «think-tanks», private organizations and local groups for the purpose of adopting the global and developing new knowledge)³¹.

There is a need in Serbia to identify steps in all these pillars of knowledge-based economy.

In line with the Lisbon recommendations of the year 2000, and the objective to appropriate 3% of the national budget to research and development (RD) by 2010, which was set in Barcelona in 2002, Serbia has identified in the budget an appropriation for these purposes of 1% for the year 2007. Although as absolute figures, the investments in R/D are increasing, they are considerably under the investments in new EU member states (minimum of Euro 20 per capita per year).

Education for Sustainable Development and environmental awareness in Serbia

As stated in the National Environmental Strategy (NES) «the general level of public awareness concerning the needs for environmental protection and the level of environmental friendly behavior in Serbia is low»³². This situation is a direct result of inadequate education, inconsistent implementation of existing regulation and the low standard of living. Survey results (2003) indicate that educated and affluent individuals are more willing to forego a part of their personal income for environmental benefits.

The National Environmental Strategy identified two principles. The principle of raising environmental awareness, promoting the importance of environmental education in order to raise the level of understanding of the problem by the public and arousing interest in environmental issues. And last, but not least, the principle of public information and participation emphasizes the need for environmental data to be made publicly available.

Formal environmental education in Serbia has not been developed to a satisfactory level. Within the education curriculum for *primary education* in 2001, the multidisciplinary and intersectoral approach was introduced through the reform by introducing the principles of sustainable development in the relevant courses. Such an approach is promoted through the mandatory classes in the first and second grade of primary education: «The World around Us», mother tongue, art, physical and health education, etc. Mandatory courses in the third and fourth grade include «Nature and Society», and from first to fourth grade a number of optional courses have been introduced such as «Guardians of Nature» and «Civil Society Education».

The *secondary education*, apart from the education profile environmental-sanitary technician in nursing schools, also includes a new profile – environmental technician in the fields of chemistry, non-metals and graphic industry. Environmental contents are integrated in subjects such as biology, chemistry, ecology and environmental protection, disinfection and pest/rodent control, etc. In all secondary schools, the subject of civil society education includes environmental issues.

³¹ Development Outreach, Special Report, Fall 2001, World Bank Institute
<http://www1.worldbank.org/devoutreach/fall01/article.asp?id=122>

³² National Environmental Strategy, 2005, pp. 107.

The general education curricula for grammar schools environmental topics are taught in subjects such as biology, chemistry, geography and physics during all four years, as well as in subjects such as philosophy, sociology, Constitution and civil rights. Within the group of general education courses there is a course biology and ecology, and there are interdisciplinary contents including production technology and standards in environmental protection, and management of by-products and waste³³.

In respect to education at *university level*, environmental protection is studied at four universities founded by the Republic of Serbia (Belgrade, Niš, Novi Sad and Kragujevac), as well as faculties in Bor, Zrenjanin and Kosovska Mitrovica. At more than ten faculties there are departments, divisions or study groups in this field as well as post-graduate studies (for under-graduate studies, see Annex 1). The biggest law and economics faculties in Belgrade do not have post-graduate studies in environmental economics or law. At the faculty of Economics there are no courses of this type at under-graduate studies. The Faculty of Law in Belgrade, during the fourth year of studies has an optional course Environmental law, and the new curriculum in the eighth semester includes an optional course in Environmental Law³⁴. Within the current university reform, in line with the Bologna declaration principles and new provisions of the Law on University, further changes in this area are anticipated.

There is no systematic data regarding the programs at different levels of courses taught at private universities, although it is true that some privately-owned universities have in their curriculums environmental subjects or study groups³⁵. For example, at the first privately owned university in Belgrade, at the Faculty of Management, there is a post-graduate study of environmental management³⁶.

The level of environmental awareness and environmental friendly behavior in Serbia is not high. Numerous public opinion surveys confirm this conclusion. For example, surveys from January 2006 at a representative sample of population of age in the territory of Serbia, excluding Kosovo, among spontaneous replies to multiple choice question «What are the major problems that Serbia is faced with at present?» there were no replies relevant to environmental protection. Over the past ten years or so environmental and pollution issues have not been recognized as problems on the list of priorities by those included in similar public opinion surveys³⁷.

Informal education and other forms of raising awareness are not coordinated sufficiently and are not accessible to all categories of the population. Based on present experience, the National Environmental Strategy (NES) suggests the introduction of small grants for NGOs participating in environmental education and raising public awareness, as a model of cooperation between the public and private sector in promoting environmental values and values of sustainable development.

³³ Ibid.

³⁴ New educational curriculum at the faculty of Law, Belgrade was adopted in December 2005

³⁵ Ministry of Education and Sport of the Republic of Serbia in the special issue of the teaching staff "Education review" for the academic year 2005/2006, published the announcement for enrollment of students to the first year of studies in colleges and universities founded by the Republic which does not include data on curriculums at privately owned faculties.

³⁶ University "Braća Karić", <http://www.uni-bk.ac.yu/>

³⁷ SMMRI, according to statement made; February 2006.

Open issues

- The link between development requirements of the economy and the optimal structure of education profiles:
 - Arrive at consensus regarding the level of investment in education reform and provide for continuity in implementing the identified steps of the reforms;
 - Regular and systematic monitoring of changes existing between the demand of the labor market and the existing qualification profile of the working population;
 - Develop programs of life-long learning and training at the work place;
 - Identify strategic priorities based on the knowledge-based economy.
- Promotion of the concept of environmental sustainability and protection in formal education, informal education and public information:
 - Improve environmental education at all levels;
 - Improve professional environmental education at university level by introducing courses at under-graduate studies, by establishing departments for under-graduate, post-graduate and specialization studies in environmental protection, environmental law and environmental economics and ethics;
 - Raise public awareness and promote environmentally friendly behavior among all categories of population, especially regarding separation of municipal waste and tourism, especially in protected areas;
 - Participate actively in all activities of the UN Decade of Education for Sustainable Development, including a development of a strategy of education for sustainable development.

Open issues of general type

- Improve integration of environmental considerations into other sector policies and implement:
 - Multisectoral approach to research and assessments / evaluation of current status, which are to precede the development of strategy papers,
 - Multisectoral approach to assessment of capacities and activities of international actors relevant for sectors under review;
- Respect all institutional levels in implementing adopted strategy objectives, with focus on local government (town and municipality);
- Adjust the specific national conditions and the resulting national development priorities with the requirements by the EU in the process of accession;
- Establish links between environmental pollution expenditures and investments in improving the environment with the assessment of actors bearing the costs on one and investments on the other side. As the major (but not the only) «investor», the Republic is the one that significantly influences the distribution of (not only economic) expenditures;
- In order to achieve greater effectiveness in implementing long-term strategies, including the Strategy of Sustainable Development, there is need to operationalize through action plans short-term objectives at annual level and correlate them with the budget and other funding sources;
- Develop a system of indicators and systems of monitoring the indicators of sustainable development and bring them in correlation with the UN Millennium Development Goals.
- Provide preconditions for segregated monitoring of relevant indicators at district/region level, and monitoring focused on vulnerable social groups.

- Actively raise awareness and environmental friendly behavior among all population groups through formal education and also through informal education and information;
- Prepare the Sixth Ministerial conference «Environment for Europe», to be held in Belgrade in 2007.

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Appendix 1: Qualification profiles related to environmental protection at undergraduate studies at universities founded by the republic of Serbia³⁸

	Faculty	City	Education profile (department, study group, specialization)
1	Faculty of technology and Metallurgy	Belgrade	Department for Environmental Engineering
2	Technical Faculty	Bor	Department of Technology: group for Environmental Engineering
3	Forestry Faculty	Belgrade	Department for Erosion and Flood Protection
4	Chemical Faculty	Belgrade	Study Group: environmental chemist, B.Sc.
5	Biological Faculty	Belgrade	Study Group: Ecology and Environmental Protection
6	Geographical Faculty	Belgrade	Study Group: Geological-Spatial Basis of the Environment
7	Civil Defense Faculty	Belgrade	Division: Civil Defense and Environmental Protection
8	Faculty of Technical Sciences	Novi Sad	Filed: Environmental Engineering
9	Faculty of Natural Sciences and Mathematics	Novi Sad	Specialization: Biology and Ecology, Ecologist – Environmental Protection, B.Sc.
			Specialization: Chemist – Engineer for Quality Control and Environmental Management
10	Technical Faculty «Mihajlo Pupin»	Zrenjanin	Specialization within environmental engineering: Engineer of Technical Systems Management
11	Faculty of Natural Sciences and Mathematics	Niš	Department for Biology with Ecology: Environmental Biologist, B.Sc.
12	Faculty of Safety at Work	Niš	Department: Environmental Protection
13	Faculty of Natural Sciences and Mathematics	Kragujevac	Study Group: Biology with Ecology: Environmental Biologist, B.Sc.

³⁸ “Education Review, special issue for the academic year 2005/2006, announcement for enrollment of students to the first year of undergraduate studies at universities founded by the Republic of Serbia.

14	Faculty of Technical Sciences	Kosovska Mitrovica	Mining Department: Environmental Protection
			Technology Department: Environmental Protection