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**METHODOLOGICAL RECOMMENDATION FOR DEVELOPMENT OF  
GOVERNMENTAL STATE OF ENVIRONMENT REPORTS**

**1. Introduction**

1.1. In order to ensure efficient environmental management, it is necessary to review environmental priorities permanently, based on analysis of rapidly changing current developments. Such permanent review should allow to focus very limited finance resources at key environmental priorities. To this end, it is very important to have relevant and reliable information on state of environment and natural resources and this information should be easily accessible for authorities and the public at large. A State of Environment Report (SoE) is a key source of information on these matters. It is an important element of the information base and of the whole process of environmental information dissemination.

1.2. The Recommendations are based on the analysis of national SoE reports in 12 countries of Eastern Europe, Caucasus and Central Asia (referred hereinafter to as 12 countries). The Recommendations consider a special roles that SoE Reports (referred hereinafter to as Reports) play in these countries, in particular, they contain comprehensive environmental information, reflect individual national environmental protection needs, provide conclusions necessary for environmental decision-making, contain necessary information for development of NEAPs, NEHAPs and Strategies for Sustainable Development, promote integration of environmental and socio-economic policies; promote selection of priority environmental needs at the national and international levels; and facilitate exchange of environmental information between countries.

1.3. The Recommendations account for international experience of development of

national Reports summarized by European Environmental Agency, OECD and UNEP/GRIP-Arendal.

## **2. The Goal of Recommendations**

2.1. The Recommendations were developed to provide methodological guidelines for permanent governmental entities of 12 countries, pertaining to improvement of development of national State of Environment Reports. The use of Recommendations will promote harmonization of approaches in these countries and in countries of Western and Central Europe to facilitate complex state of environment assessments in UN ECE region.

2.2. The draft Recommendations mainly focuses on selection of environmental indicators, use of modern information technologies in the course of development and dissemination of these publications and enhancement of use of the Reports for environmental decision-making.

## **3. Objectives of the Recommendations**

- To assist in making Report of each of 12 countries an instrument that will reflect its environmental problems and ways of addressing them.
- To propose concrete ways for improving use of Reports for environmental policy-making and decision-making.
- To propose indicators that might better reflect the state of environment, environmental impacts and response measures
- To propose examples of modern information technologies to be used for Reports' preparation and dissemination
- To propose methods to improve public access to information of Reports.
- To propose methods of Reports' quality assessment

## **RECOMMENDATIONS FOR ORGANIZATIONAL DEVELOPMENT OF GOVERNMENTAL STATE OF ENVIRONMENT REPORTS**

### **4. Legal status of Reports**

4.1. Reports should have status of official Governmental documents. Legislative base of the Reports could be provided by a separate article in a national Law on Environmental Protection, authorising a national government to develop and disseminate regular reports on environmental quality and natural resources. In order to ensure efficient enforcement of such legislative act, it would be important to tighten control of compliance with relevant legislative provisions, including transparency of their application and reduction of discretionary powers of administrative officials (e.g. in "softening" information about dangerous environmental problems and their causes, insufficient efficiency of measures taken to improve the state of environment, in decision-making on terms of completion of Reports, etc.).

## **5. THE ANALYTICAL APPROACH TO DEVELOPMENT AND PRESENTATION OF MATERIALS FOR REPORTS**

5.1. In contrast to relevant statistical compendia, a governmental report on state of environment and environmental activities should be an analytical document which contains state of environment assessment and analysis of underlying cause - effect relationships of its changes. Analytical nature of the document would allow to use it as an information base for decision-making on improving environmental and socio-economic policies; legislative base; mechanisms of state of environment control; for assessment of compliance with environmental legislation; development and implementation of environmental programs; scientific and technical research,

aimed to promote environmental safety; for assessment of efficiency of measures for improvement of environmental protection and rational use of natural resources as the base of sustainable development.

5.2. The analytical approach to development and presentation of materials for Reports is mainly associated with the following:

- analysis of data, reflecting quality of the environment and natural resources, identification of trends of change, comparatively to a previous reporting period (comparative analysis of relevant data);
- identification of underlying factors of these changes;
- development of forecasts for the future;
- assessment of efficiency of response actions being implemented to mitigate adverse environmental pressures;
- assessment of efficiency of governmental environmental policies;
- qualitative and quantitative assessment of the state of environment and natural resources, anthropogenic pressures and natural disasters.

## **6. Use of indicators to assess the state of environment and natural resources**

6.1. In the course of development of Reports, it is important to select and use different indicators, allowing to assess environmental situation adequately.

6.2. In the course of selecting indicators, it is important to bear in mind, that they need to reflect correctly the process and the state of objects in an understandable form as well as to reflect progress in time.

6.3. Indicators may incorporate four major categories:

1. parameters reflecting environmental impacts;
2. parameters of environmental quality;
3. parameters of environmental consequences
4. parameters reflecting response measures

6.4. As an example different environmental indicators may be proposed, which may be used to assess environmental quality, quality of natural resources and governmental control of users' compliance with the due environmental legislation.

6.5. Every country should individually decide on use of specific indicators and necessary level of details for particular sections of national Reports based on its own environmental and economic peculiarities as well as national environmental priorities. In any case, it is necessary to seek to use indicator sets elaborated on the international level. As an example, one may consider the set of indicators used for development of Kiev Report on State of Environment in UN ECE Region.

## **7. Goals of Reports**

7.1. Governments should clearly define **aims of Reports, their main contents and structure**. It is important to stress, that a Report should provide the framework for adjustment of environmental priorities and activities, for development and implementation of programs, dedicated to environmental improvements in the country. Reports should provide the base for development of environmental policy.

## **8. Sources of funds to cover costs of development and dissemination of Reports**

8.1. Governments need to identify specific **sources of funds to cover costs of development and dissemination of Reports**. These costs should be mainly covered from the national budget and regional/local budgets. Budgetary finance resources should be used for development and publishing of Reports and for dissemination of these reports among target

audiences at federal, regional and local levels.

8.2. Besides that, some financing for development, publishing and dissemination of Reports may be also provided by other interested parties, e.g. facilities, companies, business associations, national and foreign donor organisations and finance institutions.

8.3. Assistance for development, publishing and dissemination of Reports may be also provided in non-monetary forms. For example, non-governmental organisations could assist in implementation of information campaigns to inform target audiences on key highlights of Reports, they may conduct press-conferences, briefings, seminars, and other information dissemination events, dedicated to Reports.

## 9. Target audience

9.1. Governments should seek to make **target audiences** of Reports as broad as possible, including:

- executive and legislative bodies;
- regional and local authorities;
- businesses;
- academic community;
- national, regional and local NGOs (environmental groups, consumers' associations, professional associations, women's and youth organisations, associations of the disabled);
- trade unions;
- private individuals.

## 10. Direct end users of Reports

10.1. Governments should identify **direct end users** of Reports, whose activities would substantially depend on data and conclusions of these reports. These end users may incorporate *inter alia* the following institutions:

- parliaments (in many countries, national laws stipulate that ministries and agencies in charge of development of Reports are obliged to report to parliaments on state of environment and governmental actions, dedicated to improvement of environmental quality);
- federal ministries and agencies in charge of natural resources use, environmental management and public health;
- local agencies, responsible for local environmental quality and use of local natural resources;
- polluters, that directly affect environmental quality by their operations;
- scientific organisations;
- non-governmental organisations, that may use information of Reports to raise public awareness on issues of environmental quality, use of natural resources and public health.

## 11. Procedures for dissemination of Reports

11.1. Governments should identify procedures for dissemination of Reports, accounting for needs of target audiences. Reports should be disseminated:

- directly among relevant ministries and agencies;
- in the Internet;
- via mass media outlets;
- via PR services of ministries and agencies, participating in development of Reports;
- via information services of non-governmental organisations;
- in the course of public information dissemination events;
- in the course of environmental seminars and conferences.

## **12. Institutional framework**

12.1. As for institutional framework of Reports, Governments need to secure close cooperation between governmental and other bodies participating in the preparation of Reports by establishing permanent governmental entities responsible for preparation and further dissemination of the Reports. Functions of such governmental entities should be broadened, institutionalised and made transparent for control of non-governmental organisations.

12.2. Such governmental entity should:

1. be **authorised to get necessary information from governmental bodies, dealing with:**

- monitoring of environmental quality, natural resources, cultural and archaeological heritage;
- state management and control of use of natural resources;
- protection of natural resources and the environment;
- state environmental assessments;
- state statistical reporting in spheres of natural resources use, environmental impacts and environmental expenditures;
- sanitary and epidemiological control and other functions, associated with health impacts of environmental factors,

2. **identify key sources of information for development of Reports:**

- organisations, authorised to provide information for Reports;
- state statistical reporting;
- data in possession of governmental entities;
- data in possession of independent experts and non-governmental organisations (mainly to compare with official data and to identify reasons of data mismatch);
- data of international environmental information centres (mainly to check adequacy of national official data);
- data in possession of national scientific and research institutes obtained due to grant financing;
- data of managers of privatised facilities

3. strengthen environmental monitoring systems as the key source of information on environmental quality, in order to provide an array of primary data for further use in the course of development of Reports and develop a uniform system of pollution assessment.

4. set up a computerised database for development of Reports;

5. develop core sets of environmental indicators for application at national and regional levels;

6. consult subcontractors and co-ordinate their activities;

7. bear responsibility for information processing and analysis, development of draft Reports and their timely submission for governmental review and approval;

8. ensure coverage of major issues in the Reports;

9. initiate establishment of inter-ministerial expert and advisory groups, incorporating officials of key ministries and agencies, representatives of research facilities and NGOs for development of relevant sections of the Reports.

10. analyse materials, submitted for development of the Reports.

11. organise discussion on the draft of the Report, prior to its submission for governmental review. It should be discussed and approved by boards of senior officials with involvement of authorised representatives of relevant ministries, agencies, scientific, business and public which took part in the preparation of the Reports.

12. consult expert and advisory groups at different stages of processing information materials for Reports prior to their submission to the government.

13. prepare a draft of Governmental order addressed to appropriate ministries and regional administrations instructing them to take necessary measures to implement proposals and recommendations contained in the Report;

14. set frequency of publishing of the Reports;

15. facilitate broad dissemination of the Reports after its publication;

16. initiate evaluation of the quality of the Report after its publication and dissemination via target audience and users.

12.3. It is appropriate to make structure of the Report a subject to determination by the Government, however the selected governmental entity should be allowed to correct the structure depending on changes of environmental situation, priorities, accessibility of necessary materials, etc.

### **13. Use of modern information technologies**

13.1. Governments should initiate use of modern information technologies for the preparation of Reports. It makes Reports user-friendly, reduce the amount of materials, helps to structure the information better. One can use illustrative materials - tables, charts, diagrams, and maps, accompanied by explanations, analysis and data interpretation.

13.2. Presented figures should not be limited to absolute values only, absolute figures should be compared with applicable sanitary standards, environmental norms of emissions or standards of rational resource use.

13.3. A mix of narrative texts and illustrative materials makes information more easily understandable. Such forms of information presentation make Reports user-friendly to both professional specialists and members of the general public.

13.4. In recent years, satellite photos are increasingly used. However, it is important to accompany these photos by their detailed descriptions and interpretation.

13.5. At the same time, it seems fairly appropriate to present maps in Reports. These maps should provide graphic information on pollution sources, spatial distribution of pollutant releases of specific sources, contaminated areas or protected territories.

13.7. It is appropriate to present diagrams and graphs in Reports (in particular, the ones that illustrate relative percentages). Presenting information in the form of graphs is especially appropriate when the tendency of changes in parameters with time is demonstrated.

### **14. Assessment of Reports**

14.1. Governments should initiate quality assessment of already developed and published Reports based on the opinions expressed by targeted audience and their end-users. The assessment should be based on the following key principles:

- quality, completeness and reliability of Reports' materials;
- structure of Reports;
- convenience of Reports for users;
- usefulness of Reports for environmental decision-making and policy

development purposes

14.2. The following methods may be used for assessment of published Reports:

- surveys of experts of ministries and agencies on usefulness of Reports in their activities;

- opinion polls;
- questioning;
- comments of experts, involved into development of the Reports;
- media coverage of the Reports;
- readers' comments;
- phone hot-lines;
- contracted reviews

14.3. After completion of assessment of a Report, it is important to carry out consultations with participation of experts, representatives of interested ministries and agencies, members of the general public on options for further improvement of Reports and their application for decision-making purposes.

## **15. METHODOLOGICAL RECOMMENDATIONS ON MAIN SECTIONS OF THE REPORTS**

**15.1. Main sections of the Report are as follows:**

**15.1.1. INTRODUCTION**

**15.1.2. ENVIRONMENTAL QUALITY AND STATE OF NATURAL RESOURCES**

**15.1.3. ENVIRONMENT IMPACTS**

**15.1.4. ENVIRONMENTAL SITUATION IN REGIONS**

**15.1.5. ENVIRONMENTAL POLICY MEASURES AND STATE REGULATION OF THE USE OF NATURAL RESOURCES AND PROTECTION OF THE ENVIRONMENT**

**15.1.6. CONCLUSIONS**

### **151.1. INTRODUCTION**

**15.1.1.1.** In the Introduction to a Report it is appropriate to provide a brief description of peculiarities of socio-economic situation in the country and changes in the structure and volumes of industrial production (making industry more environmentally friendly, reducing energy consumption, level of depreciation of fixed assets, level of use of innovative, resource efficient and environmentally sound technologies, dynamics of use of natural resources per capita, emission of pollutants to the environment per capita, etc.), housing and utilities sectors, agriculture and transport that caused changes in the state of environment and natural resources. It is appropriate to reflect environment impacts of social factors such as poverty.

**15.1.1.2.** It is appropriate to name governmental, scientific and other organisations that participated in preparation of the Report.

### **15.1.2. ENVIRONMENTAL QUALITY AND STATE OF NATURAL RESOURCES**

In the course of assessment of environmental quality, the following aspects should be addressed:

15.1.2.1. Air quality in urban areas and industrial centres by the following monitoring data:

a) the number of cities, where annual average MACs were exceeded 1 or more times for at least one pollutant under control, as well as information on population, exposed to these impacts;

b) the number of cities, where maximal one-time MACs were exceeded in 10 or more times, as well as information on population, exposed to these impacts;

c) the number of cities with high air pollution levels (to be assessed, based on an integral parameter, e.g. 5-fold or 7-fold exceeding of annual average MACs for all pollutants under control, measured as MACs for sulphur dioxide), as well as information on population, exposed to these impacts;

d) the number and the list of cities with extremely high air pollution levels (to be assessed, based on an integral parameter, e.g. 10-fold or 14-fold exceeding of annual average MACs for all pollutants under control, measured as MACs for sulphur dioxide), as well as information on population, exposed to these impacts;

- Emissions of main air pollutants in the country as a whole;
- Background air quality (preferably, in biosphere natural reserves or similar relatively clean territories);
- Transboundary air contamination by acidifying and eutrophication-inducing substances, heavy metals and persistent organic pollutants, covered by Geneva Convention on Long-range Transboundary Air Pollution (1979) and Stockholm Convention on Persistent Organic Pollutants (2001);

**15.1.2.2.** It is also important to reflect the most difficult periods of time, associated with worsening of air quality that occurred within a reporting period and their underlying causes (e.g. droughts, forest fires, industrial emissions, exhaust gases, etc.).

**15.1.2.3.** The section should provide analysis of causes of low air quality (non-compliance with the due environmental legislation, underfunding, inadequately skilled personnel, administrative offences, etc.).

**15.1.2.4.** The final part of the section should contain a list of specific response actions aimed to improve the current situation (legislative initiatives, participation in international environmental programs and projects, investment projects, donor assistance, technical assistance, training, etc.).

#### **15.1.2.5. Changes of climate and the Earth ozone layer**

**15.1.2.6.** While presenting information about climate change and state of the Earth ozone layer it is appropriate to address the following aspects:

- Specific climate features in a reporting year (a time series of annual air temperatures, spatial and seasonal distribution of precipitation, duration of snow cover seasons, etc.), comparatively to relevant average long-term parameters;
- Data of greenhouse gas emissions;
- Data of production and import of ozone depleting substances;
- State of the Earth ozone layer (e.g. aggregate average ozone concentrations over the whole national territory or data with regional breakdown for a reporting year, comparatively to average long-term levels);
- Sun activity and its impact on the environment including natural disasters, biodiversity, human health and climate.

#### **15.1.2.7. State of surface and underground waters.**

While presenting information about the state of water resources it is appropriate to address the following aspects:

- Describe river flows in a reporting year in comparison to averaged long-term data for the whole national territory and for major river basins (due to the fact that efficiency of wastewater dilution depends on flows of relevant water bodies/waterways). Annual discharge data should be presented for the most common water pollutants in comparison to a previous year (years).
- Present water quality information (in terms of levels of specific hazardous



pollutants, measured as ratios of excess of relevant MACs), .

- Present both measured maximal levels and averaged data (provided a sufficiently uniform data array if available).
- In the case of fishing water bodies, it is important to present information on oxygen levels in water. Should oxygen levels be found to be dangerously low, it would be important to identify underlying causes, including both natural and man-induced ones.
- Reports should also provide information on specific activities of relevant bodies for improvement of water quality (implementation of programs for protection and rehabilitation of water bodies; mobilisation of finance and technical assistance for implementation of projects; public involvement into activities for improvement of quality of water bodies, etc.).

#### **15.1.2.8. Marine environment and coastal areas**

**15.1.2.9.** Marine environment and coastal areas may be described in Reports by such indicators as levels of hazardous substances in coastal water and estuaries, migration routes of fish species of industrial significance and their spawning water areas, pollution of coastal water of recreational significance and contamination of coastal land areas. Besides that, the coastline may also change under impact of waves and currents, exaggerated by natural or anthropogenous factors.

**15.1.2.10.** If Reports deal with coastal areas bordering other countries, e.g. in the case of the Black Sea and the Caspian Sea, it is important to provide information on transboundary pollution and refer to data of Reports of neighbouring coastal countries (in addition to national data). In such cases it is important to provide data on domestic pollution releases into seas and information on transboundary fallout (as percentage shares of the overall fallout).

#### **15.1.2.11. Land and soil resources.**

**15.1.2.12.** At the background of radical changes in land ownership relations, it is important to reflect associated land use changes in Reports - e.g. reduction/increase of particular categories of land areas, reduction of land areas, caused by wind/water erosion, desertification, growth of trees and bushes, etc. Soil quality changes should be also presented - e.g. changes of humus contents, soil acidity, levels of nutrients, persistent pesticides, waterlogging, soil salination, etc.

**15.1.2.13.** It is important to list the major causes of land degradation, based on analysis of collected data (urbanisation, construction of transport infrastructures, hydrotechnical facilities, mining facilities. etc.), as well as soil erosion or salination (grazing and cultivation, inadequate irrigation, etc.).

**15.1.2.14.** Reports should also provide a list of activities, implemented at different levels to combat soil erosion and land degradation (e.g. sustainable agriculture, reduction of cattle stocks, establishment of recreation zones, etc.).

#### **15.1.2.15. State of flora**

**15.1.2.16.** Special attention should be paid to dynamics of change of natural plant communities, including *inter alia* plant communities of tundra, taiga, steppes, deserts, etc.

**15.1.2.17.** In addition to information on changes of overall forest areas, state of forests should be assessed by: ratios of forest areas of different uses, changes of areas, covered by the most valuable tree species, estimates of annual growth of timber stocks, felling areas in general purpose forests, areas of sanitary felling, reforestation, forest losses caused by fires, plant diseases, insects, industrial pollution, etc.

**15.1.2.18.** These sections of Reports should incorporate information on activities being implemented for protection and rehabilitation of forest ecosystems, namely: reduction of industrial pollution, tree planting, combating forest pests, establishment of recreation zones, development of programs for sustainable forest management, implementation of international

technical assistance programs, etc.

**15.1.2.19.** Besides that, it is important to provide information on operations of domestic and international logging and timber companies, and to analyse their compliance with environmental standards and requirements.

**15.1.2.20.** Reports should also address issues of genetically modified trees and protection of natural diversity of forest ecosystems.

**15.1.2.21.** Final parts of forest sections of Reports should provide specific recommendations for improvement of forests, namely: expansion of forested areas, tree planting, prevention of plant diseases, combating forest fires and development of sustainable forest management.

#### **15.1.2.21. State of fauna**

**15.1.2.22.** In the course of presenting these issues, it would be appropriate to present information on dynamic changes of populations of wild animals of hunting significance in relation to hunting intensity, available food stocks, climate conditions in a given year, etc. It is important to assess causes of decrease of stocks of wild animals of hunting significance (e.g. poaching, irrational hunting practices, environmental contamination, etc.). It is appropriate to provide information on national, regional and local measures for expansion of stocks of wild animals of hunting significance (e.g. legislative initiatives, counter-poaching actions, artificial reproduction, etc.).

**15.1.2.23.** State of fish stocks should be assessed, based on fish stocks and fish catches in seas and inland water bodies. In this connection, it would be appropriate to present information on environmental quality of water bodies (relatively to fishing requirements) and industrial reproduction of fish stocks. In countries, that are engaged into sea fishing, it would be appropriate to reflect also status of sea animals, shellfish, crustaceans, etc. It is important to present such information in comparison with a some definite period of time (e.g. relatively to the year of the previous report).

**15.1.2.24.** It is important to analyse changes of fish stocks, to assess underlying causes of negative trends, say, decreasing fish catches (e.g. pollution of water bodies, overcatching, poaching, etc.). It is necessary to provide information on national measures for expansion of fish resources, namely: improvement of national legislation, counter-poaching actions, participation in implementation of international treaties, etc.

#### **15.1.2.25. Protected territories, biodiversity, rare and extinct species.**

In the course of review of these aspects, special attention should be paid to dynamics of changes of natural regional plant communities (e.g. communities of tundra, taiga, steppes, deserts, etc.).

**15.1.2.26.** Biodiversity issues should be addressed at the background of changes, that were observed in the reporting year at the national level and in some regions, where these changes were especially intensive.

**15.1.2.27.** Changes, pertaining to protected territories, should be considered separately for individual categories of these territories:

- state natural reserves,
- state game reserves,
- national parks,
- natural monuments,
- recreational areas, etc.

**15.1.2.28.** Among rare and extinct species, first of all, it would be appropriate to consider species, that have been already listed in Red Books and the ones that should be listed.

**15.1.2.29.** Reports should provide information on resources, allocated for support of protected territories and improvement of laws and regulations, dedicated to biodiversity

conservation.

**15.1.2.30.** It is also important to provide information on implementation of programs for prevention of pollution, degradation and destruction of habitats in the most sensitive ecosystems, on international biodiversity conventions and treaties, signed and ratified by a country in question.

**15.1.2.31.** Besides that, Reports should provide information on expansion/decrease of areas of protected territories, increase/decrease of finance support for systems of protected natural territories, on development of legislative initiatives, support of public initiatives, participation in international programs and projects for biodiversity conservation, mobilisation of technical and donor assistance.

#### **15.1.2.32. State of geological environment, extraction and use of fossil fuels**

**15.1.2.33.** The state of geological environment is understood to incorporate existence and development of karst, thermokarst and landslide processes, subsidence of the earth surface due to underground cavities, developed due to underground extraction of mineral resources, cracks in the Earth crust, upraise of groundwater levels, caused by anthropogenous activities and similar developments that endanger human life and damage constructions, transport facilities, power supply lines.

**15.1.2.34.** These phenomena should be assessed accounting for their scale, associated risks posed, dynamics of their development and damages for the economy and residents. It is important to provide information on implementation of actions for prevention/termination of these processes, and to assess sufficiency of these actions.

**15.1.2.35.** It is appropriate to consider extraction of mineral resources by underground and open mining facilities from the point of view of landscape interruptions associated with these activities, interruptions of flow regimes of surface and ground water, as well as accounting for air pollution caused by blasting operations, burning slagheaps and flares, hydrogen sulphide emissions by mine ventilation installations, etc.

**15.1.2.36.** It is appropriate to assess use of extracted mineral resources by percentage shares of extraction of usable ore components, by comprehensiveness of their extraction and by amounts of waste disposed per unit of output, etc.

#### **15.1.2.37. Health impacts of environmental factors**

**15.1.2.38.** Health and environment sections of Reports may provide descriptive information on adverse health impacts of environmental factors. Besides that, these sections should provide lists of measures, being implemented to reduce these adverse impacts.

**15.1.2.39.** These sections of Reports are not intended to duplicate Health Reports. However, absence of these sections in Reports substantially reduces their value for decision-making and environmental policy development.

**15.1.2.40.** In this connection, dynamics of environment-dependent morbidity should be discussed at the background of mainstream demographic processes (birth rates, mortality, population growth (accounting for emigration and immigration), and estimates of living standards of the majority of population.

**15.1.2.41.** It is important to demonstrate impacts of environment pollution (air, water, soil) by specific pollutants on morbidity rates (including genetic and reproductive morbidity) of major population groups (children, audits of different age groups) in a reporting year. These assessments are usually made in comparison to morbidity levels of relevant population groups in relatively "clean cities". Besides that, it is important to assess health impacts of drinking water quality.

**15.1.2.42.** In countries with areas of radioactive contamination (due to nuclear tests or nuclear accidents), it is important to provide assessment of radioactive contamination of local food products and describe actions, being implemented to produce "clean food".

**15.1.2.43.** In recent years, problems of noise, vibration, electromagnetic radiation caused increasingly serious concerns, so these aspects should be also referred to in Reports.

**15.1.2.44.** Health indicators of environmental quality incorporate also spread of vectors of encephalitis and malaria, new spots of anthrax and other animal diseases, associated with risks to human health.

#### **15.1.2.45. Waste impacts on the environment**

**15.1.2.46.** Industrial, agricultural and municipal waste-related issues, waste storage, reprocessing and elimination is an important section of Reports. In the course of presenting waste-related issues, it is recommended to provide dynamic trends of annual generation and accumulation of toxic waste. In this connection, it would be appropriate to demonstrate (at the national level) dynamic trends of generation and accumulation of different categories of waste, dynamic trends of their recycle (utilisation), neutralisation, storage and disposal. It is important to present dynamic trends of allocation of land areas for waste disposal purposes, reliability of waste storage facilities, their impacts on quality of surface water bodies and groundwater.

**15.1.2.47.** As a separate issue, it is necessary to present information on problems, associated with liquid/solid radioactive waste, if any, including their accumulation, temporary storage conditions, treatment and burial.

**15.1.2.48.** Information should be presented on waste collection and treatment at the municipal level, including information on funding of waste management services, state of landfills, implementation of new initiatives for waste treatment and recuperation of resources. It is appropriate to present information on public awareness raising and public involvement into waste management.

**15.1.2.49.** Besides that, it is important to provide information on development of laws and regulation in the sphere of waste management; mobilisation of investments, technical and donor assistance for implementation of specific projects at municipal and regional levels; exchange of experience between developed countries and economies in transition; development of programs for waste minimisation and implementation of low-waste production technologies; avoiding danger of using environmentally unfriendly technologies and methods of toxic waste elimination.

#### **15.1.2.50. State of historic and cultural heritage.**

**15.1.2.51.** Environment impacts on the state of historic and cultural heritage can be presented using information about their losses in reporting period due to natural disasters and anthropogenic factors such as air pollution, drowning of foundations of historic and cultural monuments, vibration, resulted in their destruction.

**15.1.2.52.** In recent years, cases of destruction of historic and cultural landscape by illegal constructions, rebuilding of architectural monuments distorting their appearance, plundering of archeological monuments, etc. are reported.

**15.1.2.53.** Data about such losses should be accompanied by information about measures being made to improve legislation, accounting, expertise and physical protection.

### **15.1.3. ENVIRONMENTAL IMPACTS**

**15.1.3.1.** Environmental impacts, associated with specific industries and the Armed Forces, may be presented by the following data:

- aggregate, common and specific emissions (thousand tons/year);
- aggregate wastewater discharges (million m<sup>3</sup>/year) and discharges of common and specific water pollutants (tonnes/year), water consumption and water recycle, water conservation due to application of closed-circuit water supply systems, discharges of wastewater, treated in compliance with provisional standards, etc.,

- generation of production and consumption waste in a reporting year (with breakdown by waste hazard classes), waste reuse, neutralisation and storage, aggregate waste accumulation (accounting for waste accumulation in previous years);
- alienation of land areas for construction, mining operations, waste landfills, etc.

### **Industry**

**15.1.3.2.** Industrial environmental impacts should be reflected for the whole industrial sector, as well as in their breakdown by major industries (power industry, coal industry, oil extraction and processing, gas industry, ferrous and non-ferrous metallurgy, production of construction materials, chemical and petrochemical industries, timber, pulp and paper industries, manufacturing, food and light industries, nuclear industry, etc.).

**15.1.3.3.** Comparative analysis of relevant parameters of environmental impacts of major industries allows to identify priorities for environmental management actions, including, first of all, tightening control of compliance with the due environmental legislation and review of environmental standards and requirements.

**15.1.3.4.** Data collection for this section of a Report may be easier if a country will develop its National Pollutant Release and Transfer Register (PRTR).

**15.1.3.5.** It is important to provide information of activities intended to reduce adverse environmental impacts of industry (for example, review of the due norms and approval of new norms and regulations approximated with appropriate European standards).

### **Transport**

**15.1.3.5.** Environmental impacts of transport activities should be reflected for the whole transport sector, as well as in their breakdown by major types of transport activities (road, river, sea, railway, air and industrial transport, etc.).

**15.1.3.6.** General assessments of transport-generated pollution should allow to estimate relative shares of transport contribution into:

- air pollution
- wastewater discharges, waste generation.

In the case of road transport, its contribution into urban air pollution should be assessed, including:

- aggregate releases of exhaust gases,
- emissions of specific pollutants, including carbon monoxide, nitrogen dioxide and lead,
- generation of rubber dust (as a result of tire abrasion).

**15.1.3.7.** Attention should be also paid to such problems as accumulation of used tires, grease, etc.

**15.1.3.8.** In the case of sea and river transport, special attention should be paid to water contamination by oil, liquid and solid ship waste.

**15.1.3.9.** In the case of air transport, special attention should be paid to noise impacts on residents, living in areas nearby airports.

### **15.1.3.10.**

It is important to provide information of national and local activities intended to reduce adverse environmental impacts of the transport sector (use of unleaded petrol, approval of new norms and regulations, introduction of higher taxes for second-hand imported cars, etc.)

### **Housing and utilities sector**

**15.1.3.11.** Available experience suggests that these impacts should be assessed, based on air contamination by emissions of boilers (district heating and hot water supply), water contamination by discharges of inadequately treated municipal wastewater, and land

contamination by municipal landfills that, in their turn, may also pollute soils, air and water.

**15.1.3.12.** It seems important to present information on efforts of local authorities to address these problems (management of landfills, construction and repairs of wastewater treatment facilities, use of cleaner types of fuel for boilers, public awareness raising, etc.).

**15.1.3.13.** It is important to provide information on financing of activities, intended to reduce adverse environmental and health impacts of housing and utilities sector (expenditure, sources of finance, assessment of efficiency of use of finance resources).

**15.1.3.14.** Besides that, it is appropriate to provide information on results of introduction of higher tariffs for utility services (improvement of quality of these services, higher efficiency of management in housing and utilities sector, etc.)

**15.1.3.15.** It is also important to provide information on participation in international programs of technical co-operation for improvement of wastewater treatment facilities; as well as information on mobilisation of donor support and efficiency of use of available finance resources.

### **Agriculture**

**15.1.3.16.** Environmental impacts of agriculture are often associated with:

- air pollution by ammonia emissions of poultry and cattle facilities,
- water pollution by manure in the case of accidents at cattle facilities, using manure wash-out technologies,
- soil contamination by helminths in the case of use of manure as a fertiliser, without its prior decontamination.

**15.1.3.17.** Besides that, there are serious problems, associated with environmentally sound destruction of dead animals, that died from anthrax or other dangerous animal diseases.

**15.1.3.18.** Information on amounts, storage conditions and destruction of banned or obsolete pesticides is also of major importance. It is important to provide information on participation of countries in national and international programs dedicated to inventory of pesticide stocks and elimination of obsolete pesticides .

### **Tourism**

**15.1.3.19.** Environmental impacts of tourism should be paid attention in cases, associated with adverse impacts of tourism on protection of sites of global significance, natural reserves and game reserves.

### **Technogenous accidents and disasters**

**15.1.3.20.** Reports should consider all major technogenous accidents and disasters in terms of their environmental and health impacts.

**15.1.3.21.** In industry, these accidents may be accompanied by emergency releases of hazardous substances into air due to fires and explosions, leaks from production installations, damaged tanks and facility pipelines, etc. Besides that, industrial accidents may be accompanied by discharges of liquid and solid hazardous materials to water bodies and soils, both due to the above causes and due to accidents at wastewater treatment facilities.

**15.1.3.22.** In all these cases it is important to reflect damages, caused by these accidents to human health, flora, fauna and regional economy.

**15.1.3.23.** Transport-related accidents, that pose threats to the environment, may be of different nature and may be accompanied by releases of ammonia, oil derivatives, chlorine and other hazardous substances.

**15.1.3.24.** Accidents in utilities sector are often associated with destruction or damage of sanitation collectors, caused by construction or repair works, or by accidents at wastewater treatment facilities. These accidents often result in environmental contamination by sewage water.

**15.1.3.25.** It is important to provide information of activities intended to reduce adverse environmental consequences of technogenous accidents and disasters undertaken on the national and local levels particularly in preventing technogenous accidents and disasters.

**15.1.3.26.** It is important to provide information about measures to ensure nuclear and chemical safety and extraordinary situations related to anthropogenic activities and natural disasters.

#### **The Armed Forces**

**15.1.3.25.** Environmental impacts of the Armed Forces should be discussed in the same way as impacts of industry, transport and utilities. However, there are specific aspects of military impacts, that deserve special attention (impacts of radar stations, soil contamination by components of missile fuel (at missile launch sites, places of landing of missile stages), problems of utilisation of decommissioned navy vessels, including nuclear submarines, dismantling of nuclear reactors, storage of highly radioactive liquid and solid waste, etc.).

**15.1.3.25.** It is appropriate to present recommendations on providing financial and technical support to military services for addressing environmental problems.

### **15.1.4. ENVIRONMENTAL SITUATION IN REGIONS.**

**15.1.4.1.** While presenting information about state of environment in specific regions of the country it is reasonable to use existing administrative structure.

**15.1.4.2** Environmental situation in the regions can be assessed using different indicators, for example, percentage of urban population exposed to average annual concentration of air pollution exceeding MAC, 10 MAC, average emission of polluters into the air from all types of sources in the region and summarised emissions from industrial sources, summarised emissions from each source of specific air pollution.

**15.1.4.3.** Integral indicators of water pollution, summarized sewage spills and summarized spills of polluters in waste waters, as well as summarized amounts of toxic waste accumulated in reporting period can also be used as indicators.

**15.1.4.4.** Indicators demonstrating changes in demographic process, morbidity rate, especially children morbidity rate can also be important to assess social situation in the regions.

**15.1.4.5.** These assessments can be compared with other regions with their eventual ranking depending on relative environmental tensions

### **15.1.5. MEASURES OF ENVIRONMENTAL POLICY AND STATE REGULATIONS OF NATURE USE AND ENVIRONMENT PROTECTION**

**15.1.5.1.** It is appropriate to provide information about measures of environmental policy determined by the legislation, national action plans and other governmental documents. It is important to provide indicators characterizing results of the implementation of measures on reducing levels of environment pollution and improving use of natural resources, based on data of environmental monitoring and appropriate statistics of environment impacts.

**15.1.5.2.** Analysis of changes in underlying factors of pollution levels could be used as a base for prognosis of expected changes in the state of environment and for development of recommendations to improve it at the base of existing legislation, economic mechanisms, standards and norms of environment impacts, for strengthening of state environmental control, etc.

**15.1.5.3. Measures of environmental policy and state regulation on nature use and environment protection**

- Improving legislation on rational use of natural resources and protection of the environment from contamination and degradation
- Improving state standards, norms and regulations to assess and reduce pollutant emissions into the air, wastewater spills, storage of solid waste of different types, use of natural raw materials, reproduction of renewable resources, etc.
- Environmental national plans and programs presenting new principles of state environmental policy
  - Economic instruments stimulating users of natural resources to implement measures aimed to reduce environment pollution and save natural resources
- Monitoring of environment pollution and state of natural resources
- State regulations on compliance with environmental legislation on the stage of environmental expertise, approving new industrial facilities and operation of existing facilities
- State environmental expertise
- Environmental expenditures
- International cooperation in addressing environmental problems and meeting commitments of international economic agreements
- International technical, financial and advisory assistance
- Involving NGOs and other major groups
- Environmental education
- Environmental researches and development works

#### **15.1.5.4. Environmental legislation**

**15.1.5.5.** It is appropriate to provide information about new environmental legislation elaborated in the reporting period. It is important to explain its meaning. It is also appropriate to present results of analysis of the efficiency of the use of existing legislation as well as possible gaps, and give recommendations on improvement of environmental legislation system.

#### **15.1.5.6. System of state standards, norms and regulations**

**15.1.5.7.** It is important to provide information about measures on improving in the reporting period the system of state standards, norms and regulations to assess and limit pollution emission into the air, waste water spills, storage of solid waste of different types, use of natural raw materials, reproduction of renewable resources, etc This analysis should be supported by assessment of efficiency of specific state standards and norms, the process of their improvement and harmonization with international norms and standards accepted by different regional and global agreements. Main attention should be paid on information about harmonization of state standards and norms in 12 countries with appropriate standards and norms in other countries of the UN ECE region, in particular with EU standards and norms.

#### **15.1.5.8. National environmental plans and programs**

**15.1.5.9.** It is appropriate to present main principles of state environmental policy, how it is supported by national environmental action plans and programs aimed to improve the state of the environment in specific industrial centers and regions. It is useful to present analysis of their implementation, efficiency, financing from different sources. Relations between state environmental control system and regional and local authorities should be presented particularly concerning their financial, administrative and organisational relations in the implementation of environmental programs and general state environmental policy.

#### **15.1.5.10. Economic instruments**

**15.1.5.11.** Reports should provide information on use of economic instruments for regulation of natural resources use and environmental protection. Economic instruments should be linked to applicable environmental quality standards and emission permits and support these



standards. It is important to use a some mix of economically and environmentally efficient approaches for pollution prevention and control, that should be mutually supportive.

**15.1.5.12.** In this connection, use of the following measurers should be reflected:

- economic incentives (subsidies, soft loans, tax exempts, etc.);
- economic sanctions (pollution charges, taxes and fines, fees for use of forests and water abstraction, land use fees, etc.);
- compensation mechanisms (insurance of environmental liabilities, compensations for damages, etc.).

**15.1.5.13.** In the course of analysis of application of economic instruments, it is important to account for ability of environmental agencies to set rates of pollution charges at levels, that provide incentives for reduction or prevention of adverse environmental impacts and efficient use of natural resources. Besides that, it is also important to assess, whether resource prices and tax rates are sufficient to induce polluters to change their behaviour modes, to facilitate pollution prevention and implementation of cleaner technologies.

**15.1.5.14.** Reports should provide information about pollution control measures, including *inter alia*, information on imposition of monetary fines and use of sanctions (how severity of fines and sanctions, depending on a degree of non-compliance with established limits and standards, affects compliance of users of natural resources with requirements of environmental legislation).

#### **15.1.5.15. Monitoring of environment pollution and state of natural resources**

**16.1.5.16.** It is appropriate to present the situation with existing monitoring system in the country, changes in monitoring network, amount and quality of information presented, possibilities to use data in different analytical programs on the national level as the primary source of information about the state of environment and natural resources.

**15.1.5.17.** It is important to analyze possibilities of using data obtained by national monitoring systems in the preparation of international documents and reports as, for example, Environment Assessment in UN ECE region.

**15.1.5.18.** It is appropriate to present information about financing of monitoring system, using new technologies and perspectives of further development.

#### **15.1.5.19. State regulations on compliance with environmental legislation**

**15.1.5.20.** Functioning of the state control over the implementation of environmental legislation( implemented by appropriate state services, inspections, environmental procurator's office, ecological police, etc.) should be illustrated by concrete data such as the number of inspections, revealed violations and their character, used sanctions, prevented damage, etc. It is appropriate to reveal causes preventing effective functioning of state environmental control and provide recommendations on removing these causes.

#### **15.1.5.21. State environmental expertise**

**151.5.22.** It is appropriate to inform about general number of provided state environmental expertise on different levels, number of rejected construction projects and programs in a reporting period, etc. It is important to name the most significant projects which received negative resolution of the expertise as well as possible consequences if these projects would have been implemented. It is recommended to provide information on how to assess efficiency of the legislation on state environmental expertise, what should be done to improve the activity of environmental expertise on different levels.

#### **15.1.5.23. Environmental expenditure**

**15.1.5.24.** Reports should provide information on overall environmental expenditure from all sources in a reporting year (including construction works, capital repairs and

maintenance, operational costs of environmental infrastructure, administrative costs of environmental authorities, etc.), in absolute figures and as percentage shares of GDP.

**15.1.5.25.** It would be appropriate to provide breakdown of these expenditures by major sectors (protection of air, water, soils, forests, fish stocks, mineral resources, etc.)

**15.1.5.26.** It would be appropriate to provide information on relevant sources of funds (national budgets, local budgets, earmarked funds, subsidies, soft loans, extra-budgetary funds, foreign aid). It is important to provide specific examples of allocation of funds for implementation of environmental programs (including precise amounts allocated and specific sources of funding).

**15.1.5.27.** It is also important to provide information on aid flows for fulfilment of national commitments under international conventions and agreements. In particular, accession to Stockholm convention on persistent organic pollutants opens opportunities for parties of the Convention to get financial assistance from GEF for development of national action plans, dedicated to implementation of the Convention.

**15.1.5.28.** It is appropriate to provide assessment of efficiency of environmental expenditures.

**15.1.5.29. International cooperation, technical, financial and advisory assistance**

**15.1.5.30.** Reports should provide information on: specific effects of co-operation between countries and international organisations, assistance provided by other countries, foundations, IFI for addressing environmental problems. It is important to present information about provided technical assistance for implementing concrete environmental programs and projects providing information about assistance amount and sources. It is important to provide analysis of the efficiency of technical assistance, involvement of local experts into the implementation of common programs and projects. It is important to provide concrete recommendations on the use of technical assistance for addressing priority environmental projects particularly for preparing pilot examples of environmentally sound technique, equipment, industrial technologies, etc. It is important to provide a brief summary information about planned technical assistance programs in the sphere of environmental protection (the ones, a given country expects to apply for assistance to donor organisations).

**15.1.5.31.** Reports should provide lists of international conventions and agreements that were signed/ratified by countries. Besides that, it is important to provide information on implementation of provisions of these international agreements into national legislative acts.

**15.1.5.32.** It is necessary to allocate separate sections in Reports, dedicated to assessment of implementation of recommendations, resolutions and decisions of management bodies of these conventions. It is important to refer to efforts, necessary for further implementation of provisions of relevant conventions. Reports should pay special attention to information on potential sources of financing for participation in different meetings under conventions and activities of working groups, dedicated to specific provisions of international conventions and agreements.

**15.1.5.33.** Close attention should be paid to issues of accession to environmental conventions on protection and use of water resources, air pollution abatement and control, management of hazardous waste, environmental impact assessments, prevention of industrial accidents, climate change, protection of the ozone layer, biodiversity, protection of marine environment, and access to environmental information.

**15.1.5.34.** Reports should pay attention to progress in implementation of bilateral treaties and agreements on protection and use of shared natural resources, e.g. transboundary waters and protected territories. It would be appropriate to provide information on specific effects of bilateral co-operation, including information/experience exchange.

**15.1.5.35.** Reports should also provide information on establishment and activities of relevant institutional mechanisms, dedicated to improvement of co-ordination of countries'

participation in implementation of international conventions and agreements. Special attention should be paid to participation of countries in foreign assistance programs, dedicated to implementation of specific environmental programs. Reports should provide recommendations on development of more favourable conditions to attract international assistance. In particular, special attention should be paid to promotion of investments, capacity building and expansion of mutual technology transfers.

**15.1.5.36. Involving NGOs and other major groups**

**15.1.5.37.** The principle of public participation has become an integral component of key documents of the UN and other international organisations.

**15.1.5.38.** It is clear, that Reports should reflect participation of representatives of environmental NGOs in state environmental expertise, (e.g. assessment of projects for construction and modernisation of industrial facilities, road infrastructure, draft environmental projects and programs), in inspecting resource users, as well as in development and implementation of diverse actions for facilitation of public environmental awareness raising and public involvement into environmental activities. Special attention should be paid to accounting for public opinion in the course of development of policies, plans, programs and projects.

**15.1.5.39.** If NGOs submit specific information for Reports (e.g. information on air and water contamination, resource efficiency, etc.), their data should be compared with relevant official information at the stage of review of the materials submitted. Should there be differences between official data and data of independent experts, it would be important to identify underlying causes of these differences and use more reliable data.

**15.1.5.40.** Those countries, that have signed or ratified Aarhus convention on access to information, public participation in decision-making and access to justice on environmental matters, would need to provide in their Reports information on implementation of the Convention and fulfilment of their national commitments. Reports should provide specific examples of public access to environmental information, public participation in decision-making on environmental matters and access to justice.

**15.1.5.41.** A separate section of a Report should contain information on provision of information to the general public on matters, associated with hazardous activities, risks of industrial accidents, safety measures and public emergency response actions.

**15.1.5.42. Environmental education**

**15.1.5.43.** It is appropriate to describe development of systems of permanent environmental education in a reporting year, including pre-school, secondary and professional education. Besides that it is important to provide information on training and refresher training of specialists in secondary and higher education facilities, public environmental awareness raising.

**15.1.5.44.** In this connection it is important to provide in Reports information on existing environmental publications (newspapers, magazines, newsletters), including the ones published by governmental, private and non-governmental organisations. It is worth to specify target audiences of these publications (e.g. publications for specialists, the general public, publications for environmental education purposes). Besides that it seems appropriate to provide information on key issues of these publications, as well as information on their circulation and sources of financing.

**15.1.5.44.** It is also important to publish information in Reports on higher education facilities, that provide specialised environmental education (as well as brief lists of environmental curricular courses).

**15.1.5.45. Environmental research and development works.**

**15.1.5.46.** Sections of Reports, dealing with roles of theoretical and applied sciences,

R&D works for environmental protection purposes (including environmental security), should provide information of outcomes of major completed works of practical importance, as well as information on anticipated environmental effects, associated with their potential implementation for purposes of environmental protection and rational resource use.

#### **15.1.6.CONCLUSIONS**

**15.1.6.1.** In Conclusions of a Report it is appropriate to present main conclusions, forecasts and proposals. It is important to characterize briefly successes and failures of environment protection. It is important to present information about causes of failures and perspectives of addressing environmental problems.

