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DEVELOPMENTS IN IMPROVING ENVIRONMENTAL OBSERVATIONS, DATA COLLECTION AND REPORTING

IMPLEMENTATION OF RECOMMENDATIONS ON MONITORING AND INFORMATION MANAGEMENT FROM COUNTRY ENVIRONMENTAL PERFORMANCE REVIEWS

Republic of Moldova

Note by the secretariat[1]

Summary

The paper presents the recommendations on environmental monitoring and information management to the Republic of Moldova that the Committee on Environmental Policy approved on 10 October 2005 at its twelfth session, and describes the situation in the country with environmental monitoring and information management as it was at that time.

The Working Group is expected to review progress made by the Republic of Moldova in the implementation of these recommendations and to provide the country delegation with possible guidance on how to improve performance to this end.

[1] Prepared on the basis of materials of the second Environmental Performance Review of the Republic of Moldova (ECE/CEP/130).

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RECOMMENDATIONS OF THE SECOND ENVIRONMENTAL PERFORMANCE REVIEW OF THE REPUBLIC OF MOLDOVA

Recommendation 1:

The Ministry of Ecology and Natural Resources, jointly with the Ministry of Health and Social Protection and in cooperation with the Department of Standardization and Metrology, should review the national monitoring parameters and environmental quality standards:

(a) To limit substantially the number of regulated parameters by making the remaining ones consistent with international standards and guidelines;

(b) To introduce additional parameters and standards monitoring that are required by multilateral environmental agreements and EU environmental directives, and to set time schedules for phasing in those new parameters and standards that could not be introduced immediately; and

(c) To focus on a core set of parameters and standards when planning the upgrading of monitoring stations, equipment and devices, and analytical laboratories including relevant staff retraining.

Recommendation 2:

The Ministry of Ecology and Natural Resources, in cooperation with the Ministry of Health and Social Protection, the Ministry of Agriculture and Food Industry, the National Bureau of Statistics, the Agency for Forestry "Moldsilva", the State Water Concern "Apele Moldovei", the Agency for Geology "AGeoM" and other institutions concerned, should review the achievements and failures in the implementation of the 1998 Regulation on Establishing of an Integrated Environmental Monitoring System. On the basis of this review they should prepare a decree for Government adoption for the establishment of an institutional structure for inter-ministerial coordination on environmental monitoring and information. The proposal should envisage, among other things:

(a) A leading role for the Ministry of Ecology and Natural Resources in this institutional structure together with operational support by a monitoring centre to be established by the Ministry on the basis of its existing observation and information units and additional resources, as appropriate; and

(b) The preparation by this institutional structure, taking into account environmental monitoring and information provisions in various national strategies and programmes and international commitments, of a time-bound and consistent set of practical actions aimed at expanding observation networks and the number of parameters measured; improving data collection and exchange; harmonizing reporting with international requirements; and facilitating public access to environmental information.

Recommendation 3:

The Ministry of Ecology and Natural Resources, in cooperation with the National Bureau of Statistics, the Agency for Forestry "Moldsilva", the State Water Concern "Apele Moldovei", the Agency for Geology "AGeoM", should re-assess the effectiveness of their environmental reporting policies to ensure the publication and uploading onto the Internet of environmental information collected by these institutions, and to make them publicly accessible through Internet, free of charge on a regular basis and in a user-friendly form.

I. ENVIRONMENTAL MONITORING

1. In the Republic of Moldova, there are various types of environmental monitoring. They cover ambient environmental quality, state of natural resources like soils, forests and wildlife, and pollution emissions and discharges. The Ministry of Ecology and Natural Resources (MENR) plays a key role in environmental observations and data collection. Its six networks of environmental quality monitoring stations are presented in map 3.1. The main features of environmental monitoring in the country, including the role of individual governmental bodies and institutions, are presented hereunder.

A. Air quality monitoring

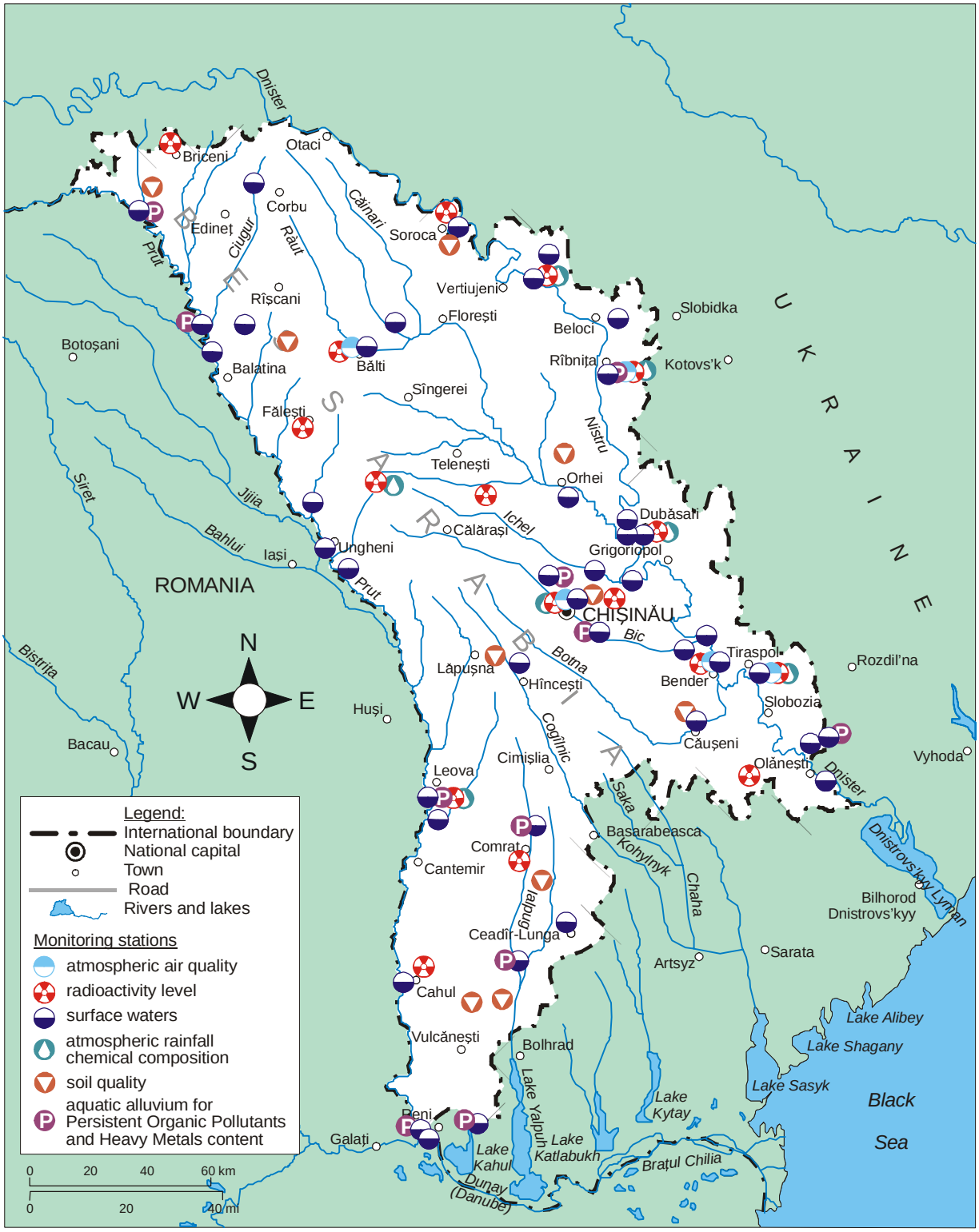
2. The State Hydrometeorology Service (HMS) through its Division of Environmental Quality Monitoring operates 17 ambient air monitoring stations in five main cities: Chisinau (6), Balti (2), Tiraspol (3), Ribnita (2), and Bender (4). In 2004, the HMS reactivated, after a decade of non-operation, its only transboundary air-monitoring station *Leova* at the border with Romania.

3. HMS stations measure a limited number of meteorological and chemical parameters (SO_2, NO_x, dust, CO, B(a)P and Pb) in urban air. Several chemical parameters required by national standards (Cu, Cr, Ni, V and Co) are not measured, and neither are air concentrations of NH_3, VOC (except B(a)P), O_3, PM_{10}, Hg and POPs. Since 2004, measurements have been made of aerosols, some POPs and some heavy metals (Cd, Hg and Pb) in precipitation at one station in Chisinau and at the Leova station.

4. The HMS has no automated stations and samples are taken manually three times a day for gas and dust concentrations in the air, and monthly for B(a)P and heavy metals concentrations in the air and for aerosols in precipitation.

5. The National Institute of Ecology had one air monitoring station in Hincesti that ceased to operate in 2000. The Ministry of Health and Social Protection (MoHSP) has 12 permanent air monitoring sites in urban areas. Maximum concentrations of six parameters (total suspended matter, O_3, NO_2, SO_2, CO and Pb) in air are measured monthly in residential areas and indoors.

Map 1: Networks of environmental quality monitoring in the Republic of Moldova



The boundaries and names shown on this map do not imply official endorsement or acceptance by the United Nations.

Source: Division of Environmental Quality Monitoring, State Hydrometeorology Service, 2004.

6. The current ambient air-monitoring network has remained unchanged since 1998, despite its inadequacy. To meet the requirements of national regulations (one monitoring station per 100,000 of urban residents) there should be two more stations in Chisinau and one more in Cahul. There is no station monitoring chemical parameters in background air. None of the stations in the Republic of Moldova meets national standards for measurements of average daily concentrations of pollutants in ambient air.

7. To fully participate in the Cooperative Programme for Monitoring and Evaluation of the Long-range Transmission of Air Pollutants in Europe (EMEP) under the Convention on Long-range Transboundary Air Pollution, the Republic of Moldova has to automate the Leova station and install two further automated transboundary stations. The HMS is looking for € 445,000 to upgrade the Leova station and to install a second station in the village of Calinesti (Balti district, the boundary region of the Prut River) to monitor northwest air flows and a third one in the city of Dubăsari (on the left bank of the Dniester River, on the border with Ukraine) to monitor northeast and southeast air flows.

B. Water quality monitoring

8. Since 1998, the HMS has increased its observation network for surface water quality by four points on four different rivers and by five points on water reservoirs. Overall, it consists of 49 observation points located on 16 of the largest rivers, six major water reservoirs and one estuary. The observation points are located near large urban areas. Diffuse pollution of surface waters is not monitored in the Republic of Moldova.

9. Samples are taken monthly to measure up to 42 hydro-chemical parameters and up to six hydro-biological parameters depending on the observation point. In 2004, the HMS started monitoring heavy metals and POPs (organo-chlorinated pesticides, including DDT and HCH) in sediments in the Prut and Bîc Rivers and all water reservoirs. In 2005, it took samples for PCB at five water-monitoring posts near electric energy installations.

10. The HMS implements a joint sampling programme with the Iasi Environmental Protection Agency (Romania) on the Prut River. Four automated monitoring stations were installed on Prut (2) and Dniester (2) Rivers in 2004, thanks to a NATO-funded project. The stations had been providing real-time data on pH, temperature, water level, conductivity, turbidity and dissolved oxygen until they ceased to operate because of inconsistencies between the stations' equipment and local telecommunication networks. The HMS expects that the project-implementing agency will fix the problem soon and that it might be also possible to upgrade the stations to monitor pollution by chemicals and oil products.

11. According to an assessment made jointly by Danish and Moldovan experts under the Denmark-funded project in 2002, to comply with monitoring requirements of the EU Framework Water Directive, the Republic of Moldova should create an additional eight river and 18 lake observation posts. To strengthen its water-quality observation network including transboundary water monitoring, the HMS prepared proposals for unspecified donor financing (some € 290,000) to install four supplementary automated monitoring stations as follows: two stations on the Răut River upstream and downstream of Balti city, one station on the Bîc River downstream of Chisinau city and one station on the Prut River at the confluence with Danube River. The HMS

considers it necessary to also start observations at Telenesti on the Ciulucul Mic River, at Cupcini on the Ciuhur River, as well as at Floresti and Ghidesti at the Răut River, where important point-pollution sources are located. By contrast, the HMS has only some vague ideas about potential sites for background water observation points. There seems to be no discussions held on how, where and when to start monitoring of diffuse pollution of surface waters.

12. The groundwater-monitoring network of the Agency for Geology of Moldova "AGeoM", consists of 186 acting observation boreholes located on 33 fields. Since 1998 the total number of observation boreholes has decreased by 36. Groundwater analysis is made on 20 physico-chemical parameters and five heavy metals (instead of 13 required by standards). The frequency of water samples varies from one to ten per month depending on the borehole observation purpose. In large water intakes samples for hydro-chemical parameters are taken twice a year and once every 2 to 3 years for heavy metals. The network needs to be expanded as it does not cover, for instance, aquifers under filtration fields belonging to sugar refineries in Drochia, Hiroveti, Ocnita, Dondusenj, Alexandreni and Singerei and aquifers affected by sewage from 35 big cattle-breeding farms. These pollution sources pose a significant threat to human health today.

13. Territorial centres of preventive medicine of the MoHSP monitor the drinking water quality of 3,550 underground wells in rural areas and 11 surface water bodies. 12 production laboratories monitor drinking water quality at water purification plants. There is no monitoring of biological parameters of surface water sources of drinking water supply in the country, however. Waters for bathing are monitored in urban areas only (at seven posts at the Dniester River and eight posts at the Prut River). In rural areas bathing waters are not monitored, as responsible public authorities have not been designated.

C. Soil monitoring

14. The HMS monitoring network for soil quality covers 3,455 ha over ten districts: in the North (Briceni, Glodeni and Soroca); in the Center (Orhei, Hincesti, Anenii-Noi and Causeni); and in the South (Taraclia, Cahul and Gagauz Yeri). Samples are taken twice a year at 52 plots. In 2004, the HMS started soil sampling for POPs (DDT and its metabolites) in the vicinity of six abandoned pesticide storehouses in different regions of the country. In 2005, it took samples for PCB at ten plots near electric energy installations.

15. The State Ecological Inspectorate (SEI) takes soil samples (including for some pesticides) on and in the vicinity of sites of industrial and other polluters. Institutions of the MoHSP monitor soil quality in recreational areas, human settlements as well as in areas around drinking water intakes. The Agrochemical Service of the Ministry of Agriculture and Food Industry (MoAFI) monitors soil quality including some pesticide residues on agricultural lands. The Institute of Geography of the Academy of Sciences published in 2004 a map of degraded lands in the Republic of Moldova. The State Water Concern "Apele Moldovei" monitors irrigated land.

D. Biodiversity including forest monitoring

16. The national network of forest monitoring, managed by the Forest Agency "Modsilva", comprises 700 control plots covering the entire country forest area. The network density is 2x2 km or 1 plot per 400 ha. There is another network comprising 12 control plots, with a density 16x16 km or 1 plot per 25,600 ha. Data from this network are collected, validated and processed according to the Guidelines of the International Cooperative Programme Forest under the Convention on Long-range Transboundary Air Pollution.

17. The forest monitoring provides data on forest ecosystems viability, productivity and protection. It serves "Modsilva" by developing proposals on the extent of forest cuts versus the status of forests, forecasting the yield and quality of wood, evaluating the forests regeneration capacity and choosing appropriate measures for improving forest health.

18. Several institutes of the Academy of Sciences (e.g., Institutes of Zoology, Botany and Genetics), the State University of Moldova and the Agrarian State University study the country's wildlife at species level. Information on the status of selected species is usually published once every three years. The Red Book of the Republic of Moldova (second edition, 2001) includes 14 species of mammals, 39 species of birds, eight species of reptiles, one species of amphibians and 37 species of insects. The publications of "Animal World of Moldova" and "Plant World of Moldova" series started in 2003.

19. The information published in the Republic of Moldova makes estimates of conservation status difficult and the information reported is somewhat unreliable. Some of the species currently reported as threatened may prove to be more common, while many other species will be added to the list as the knowledge base grows.

20. Local people are permitted to collect plants on larger tracts of nature reserves. Unfortunately, there are no data about the types or quantity of plants collected or the impact this has on the reserve. Without such monitoring, collectors might completely eliminate species from the reserves.

E. Analytical laboratories

21. The HMS has its network of certified analytical laboratories located in the main cities such as Balti, Cahul, Chisinau, Dubasari and Tiraspol. The MoHSP operates 35 territorial analytical laboratories and a central laboratory at the National Scientific and Practical Centre of Preventive Medicine (NCPM).

22. Since 1998, the SEI, which is in charge of compliance monitoring and pollution control, has closed down one (in Causeni region) of its then six certified laboratories (one central and five regional). During the same period the total number of employees decreased from 59 to 33 while the total number of air, water and soil samples taken and analyses made increased from 7,764 to 8,491 and from 22,012 to 25,265, respectively.

23. The evaluation of SEI laboratory capacities undertaken in 2002 in the framework of the World Bank Environmental Compliance and Enforcement Capacity Building Project revealed

that the equipment in SEI laboratories was obsolete. For instance, none of these laboratories are equipped for organic micro-pollutants analysis in water, air and soil samples. Only the SEI central laboratory in Chisinau makes analysis of heavy metals. In the framework of the project a gas chromatograph was supplied to the SEI central laboratory in Chisinau for measurements of pesticides and PCBs. "AGeoM" laboratories, on the contrary, remain poorly equipped.

24. There are no joint inter-calibration or training exercises organized in the country. Since the laboratories do not participate in the national and international inter-laboratory comparisons, the quality assurance and quality control issues are of concern.

F. Ambient quality standards

25. The Republic of Moldova continues to apply former USSR ambient environmental standards. The lists of ambient quality parameters have not been revised using or harmonized with international standards since Moldova received independence, except the drinking water quality parameters that are under revision in accordance with WHO requirements.

26. The system of standards is comprehensive and ambitious, covering more than 1,000 pollutants and mandating very low concentrations of pollutants. Overall, an excessively large number of regulated pollutants impose unrealistic monitoring and enforcement requirements on public authorities. Some of the Moldovan standards are below the threshold of detection, so it is impossible to know whether they are being achieved or not. Due to budget limitations, there is no routine monitoring of some pollution parameters that should be measured according to monitoring standards.

27. At the same time, existing standards do not take into account substances occurring naturally in the environment, which are characterized by seasonal variations (e.g., chlorides and sulphates in water bodies). Some substances are unregulated (for example, phosphorus, which may lead to eutrophication, and carcinogenic substances in water). No water quality parameters are defined for recreation purposes and maintenance of aquatic ecosystems.

28. Existing ambient quality standards need to be amended and built on to provide a system that can work for all stakeholders. This change is also necessary in order to comply with the policy of the Moldovan Government to harmonize its standards with EU legislation. A new system of ambient quality standards should focus on hazardous substances, taking into account both international guidelines and specifics of the environment.

II. INFORMATION MANAGEMENT AND REPORTING

A. Information systems

29. In the Republic of Moldova, there is no national environmental information system as such. Individual ministries and departments develop their own decentralized databases of relevance to the environment following their own technical protocols and procedures. Progress is made largely thanks to external support.

30. For instance, under its project implemented in 2001-2003 on "Assistance to Moldova in the Implementation of the Aarhus Convention", Denmark provided the MENR and its institutions with hardware (a server and 22 workstations), software, expert advice and training to develop and install environmental databases, "Mediul Moldovei" at the HMS and "Controlul Ecologic" at the SEI. The purpose was to improve the Ministry's information system by establishing a network of interconnected personal computers equipped with a database application designed to deal with the data on the state of the environment (water, air and soil) and data associated with the environmental legislation enforcement. Both databases are not functioning after the completion of the project in 2003.

B. Coordination and data exchange

31. Coordination and data exchange between monitoring institutions remain sporadic and are frequently the result of the individual initiative of technical experts. Despite several inter-ministerial arrangements (e.g., the agreement on cooperation between the former Ministry of the Environment, Construction and Territorial Development and the former Ministry of Health, signed in 2000) currently there are few operational channels of information exchange. This generates duplication of efforts and information gaps, and does not allow environmental information to be fully used in decision-making.

32. The Republic of Moldova made some efforts to integrate environmental data and information stored at different institutions. In December 1998, the former Ministry of the Environment adopted a regulation on a so-called integrated environmental monitoring system (IEMS). According to this regulation, which focused on actual data exchange rather than on monitoring, 15 ministries, departments and the National Academy of Sciences were expected to designate responsible institutions to participate in the exchange of data on a broad set of indicators relating to social and economic development, waste, air, water, soils, mineral resources, flora, fauna and environmental policy instruments. The designated institutions were supposed to supply information to an environmental monitoring centre to be established at the former Ministry of the Environment. The centre was expected to coordinate actions of suppliers of environmental information, process the data, operate national databases and to submit complete, generalized and specific information on environmental conditions to decision makers and the general public. The Ministry together with the former Department of Statistics had to establish formats and time schedules for data transmission. These formats and time schedules have not been developed yet.

33. Under its project on "Assistance to Moldova in the Implementation of the Aarhus Convention", Denmark assisted the Republic of Moldova, inter alia, to prepare an inventory of monitoring data and institutions performing analysis and sampling of such data, followed by proposals for setting-up an IEMS. Denmark financed the staff of the IEMS Centre that was physically located at the HMS. It also provided the Centre with a server, personal computers, software and an Internet connection to assist it in the development of the IEMS.

34. The country does not seem to have followed up proposals elaborated under the above-mentioned project. No discussion was undertaken with high-level officials in the Ministries and Departments to which specific monitoring recommendations were addressed. The authority of the 1998 IEMS Ministerial Regulation happened to be insufficient to make the IEMS operational.

Overall IEMS is not functioning and the environmental data exchange remains greatly handicapped. As no functional links were established with the HMS and other key monitoring institutions in the country, the IEMS Centre practically ceased to exist after the completion of the project and the discontinuation of the Danish financial support late 2003.

35. No more time should be spared to reinvigorate the IEMS Centre. Human and technical resources from the IEMS Centre that are presently at the disposal of the HMS should be effectively used for the purpose. The HMS Division of Environmental Quality Monitoring might constitute a core for a strengthened Centre that could serve as a working vehicle to facilitate inter-departmental cooperation on environmental data collection and management in the country.

36. There is a successful example of inter-departmental cooperation on data exchange to build on. With the support of France, the MENR, in cooperation with the MoHSP, "AGeoM" and "Apele Moldovei", has recently created a water data centre. The centre operates a decentralized but harmonized database that contains data on:

(a) Water-monitoring stations (39);

(b) Water flow and physical and chemical parameters (some 30) relating to 1993-2000;

(c) Ten rainfall monitoring stations covering data for 1993-2003;

(d) Water consumption and pollution by 2,689 economic agents in 1996-2003;

(e) Groundwater quality and quantity covering 1,660 wells;

(f) Results of the inventory of lakes and water reservoirs and wastewater treatment stations undertaken by the SEI in early 2000s; and

(g) Water accounts established for 1994, 1998 and 2000.

37. The Republic of Moldova made efforts to strengthen coordination under some sectoral monitoring frameworks. The 2000 governmental regulation on monitoring environmental pollution with radioactive, toxic and bacteriological substances established institutional arrangements for data exchange in case of emergencies. Another regulation, that was adopted two years later, aimed at improving environmental health monitoring in the country. The latter regulation helped the MoHSP to make some progress in improving data collection and reporting.

C. Environmental statistics

38. The National Bureau of Statistics has recently expanded its collection of statistical data on the environment. In particular, it has introduced statistical reporting on emissions into the air of polycyclic aromatic hydrocarbons (PAH), heavy metals and POPs. Overall statistical data is collected today from economic agents and relevant public entities in 17 subject areas. It publishes aggregate data in its statistical yearbook and transmits a detailed environmental data compendium to the MENR.

D. Environmental reporting

39. The monitoring and data collection results are, to a various extent, reported to decision-making bodies and made available to the general public and the international community. For instance, the HMS publishes:

(a) A daily bulletin on ambient air quality that is submitted to the public authorities and is uploaded on the HMS web site (http://www.meteo.md);

(b) A monthly bulletin on air, water and soil quality and the background radiation circulated among the public authorities and transmitted to the Ecological Movement of Moldova, an NGO that is publishing the monitoring data in its widely-spread quarterly bulletin;

(c) Annual reports on air quality, water quality and soil quality; and

(d) Annual State Water Cadastre (jointly with "Apele Moldovei" and "AGeoM").

40. The NCPM of the MoHSP publishes a monthly bulletin and an annual report on sanitary and epidemic conditions in the country and posts them on the web site http://www.sanepid.md. The MoHSP and the MENR jointly published national environmental health reports for the European Ministerial Conferences on Health and Environment held in 1999 and 2004. Since 2006, the NCPM plans to publish such reports annually. It also envisages creating a database and publishing a bulletin on drinking water quality.

41. Some important types of data are not published at all or are not readily accessible:

(a) Forest monitoring data and inventories by "Moldsilva";

(b) Groundwater measurement data by "AGeoM"; and

(c) Emission monitoring data by the SEI. (Single paper copies of annual inspection results may be freely accessed at the State Ecological Inspectorate).

42. The National Institute of Ecology publishes annually the National Report on the state of the environment. The last (bilingual) one was published in 2004 in 1000 copies each and uploaded on Internet (http://www.cim.moldova.md). The report is largely descriptive, as it is not based on internationally agreed indicators. It is not used in policy or decision-making.

43. The country reports regularly to the United Nations Commission on Sustainable Development and to governing bodies of applicable multilateral environmental agreements (MEAs). In a particular case, it reported the complete emission data on heavy metals and POPs to the Executive Body on Long-range Transboundary Air Pollution in 2004. National communications, national strategies and other information relating to the country's participation in MEAs and international environmental programmes (or the information on how to access these documents) are, however, rarely circulated in the country or uploaded on official environmental web sites.

44. The Republic of Moldova is not taking advantage of all opportunities to build its monitoring and reporting capacities that are provided by the UNECE Working Group on Environmental Monitoring and Assessment. Its participation and contribution are sporadic.

III. THE DECISION-MAKING FRAMEWORK

45. Since 1998, the Republic of Moldova has adopted a series of laws and regulations setting or amending the decision-making framework for environmental information. A number of policy documents on environmental information have been elaborated over the past seven years. Few of them set clear objectives or envisage concrete measures with responsible institutions, deadlines and sources of financing. Policy objectives and measures are frequently expressed in a very general or ambiguous way. As a result, it is hardly possible to assess progress in the achievement of policy objectives that were formulated in such way as to: (a) extend monitoring activities and undertake monitoring of biological resources (1995 *Concept of Environmental Protection*); (b) review and improve the environmental monitoring system (EGPRSP).

46. However, there was some progress in the achievement of a few policy objectives, in particular, the monitoring of POPs in the air (*National Action Plan on Environmental Health*), the preparation of an inventory of POPs and PCB (EGPRSP) and the creation of local environmental information centres (1995 *Concept of Environmental Protection*).

47. On the contrary, there is no evidence that several policy objectives had been or were being implemented, including:

(a) The development of a database on environmental quality and the state of natural resources, and the elaboration of programmes for monitoring surface and ground water quality, and of a national investment programme for improving the monitoring system (1995 *Concept of Environmental Protection*);

(b) The creation of a groundwater monitoring programme and the improvement of forestry inventory (EGPRSP);

(c) The establishment of a coordinating committee and a secretariat to monitor the implementation of the National Action Plan on Environmental Health, and the harmonization of water standards with EU standards (*National Action Plan on Environmental Health*).

48. Some objectives even regressed. For instance, the Environmental Information Centre of the MENR that was to expand its activities according to the 2001 *Concept of Environmental Policy* actually squeezed its activities due to drastically reduced staff numbers.

49. Overall, the existing systems of environmental information could function significantly more effectively if strategic planning and monitoring of progress made in achieving policy objectives were more effective. A substantial investment is urgently needed in staff expertise and capacity-building within the relevant public authorities to improve strategic planning and management skills.
