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LIST OF ACRONYMS

AAQMD	Ambient Air Quality Monitoring Division
AAQEMC	Ambient Air Quality and Environmental Monitoring Center
AGMR	Agency for Geology and Mineral Resources
AAM	Agency “Apele Moldovei”
CIEMIM	Center on Integrated Ecological Monitoring and Information Management
COP	Conference of the Parties
CBD	Convention on Biological Diversity
CPAC	Chemical and Physical Analyzing Center
CLRTAP	Convention on Long-range Trans-boundary Air Pollution
ECE	Economic Commission for Europe
EG	Expert Group
EEA	European Environment Agency
EIC	Ecological Investigation Center
EIC	Environmental Information Center
EHgeoM	S.E. Hydrogeological Expedition EHgeoM
EMEP	European Monitoring and Evaluation Program
ENPI	European Neighbourhood and Partnership Instrument
EU	European Union
EPA	Environmental Protection Agency
EQMD	Environmental Quality Monitoring Development
GIS	Geographical Information System
GD	Governmental Decision
IEG	Institute of Ecology and Geography
MCA	Millennium Challenge Account
MCC	Millennium Challenge Corporation
MEA	Multilateral Environmental Agreements
MoE	Ministry of Environment
MH	Ministry of Health
NBS	National Bureau of Statistics
NCPH	National Center for Public Health
NDS	National Development Strategy
NFP	National Focal Point
NGO	Non-Governmental Organization
NO_x	Nitrogen Oxide
NO	Nitrogen Monoxide
NWMS	National Waste Management Strategy
ODS	Ozone Depleting Substances
POPs	Persistent Organic Pollutants
RBM	River Basin Management
RCPH	Regional Centers for Public Health
SEIS	Shared Environmental Information System
SEI	State Ecological Inspectorate
SHS	State Hydrometeorological Service
SSPH	State Service for Public Health
SQMC	Soil Quality Monitoring Center

TAIEX	Technical Assistance and Information Exchange
TAU	Territorial Administrative Unit
TNMN	Trans National Monitoring Network
UNEP	United Nations Environmental Program
UNCCD	United Nations Convention to Combat Desertification
UNECE	United Nations Economic Commission for Europe
UNFCCC	United Nations Framework Convention on Climate Change
WG	Waste Governance
WFD	Water Framework Directive
WMO	World Meteorological Organization

Executive Summary

The purpose of this report was to consider the requirements for introducing the Environmental Neighborhood Policy Instrument – Shared Environmental Information System (ENPI-SEIS) in the Republic of Moldova. The main goal of the ENPI-SEIS project is to promote environmental protection in the ENPI countries.

The Republic of Moldova supported the idea of launching the ENPI-SEIS Project at the First session of the “Environment and Climate Change” Panel that took place in March 2011. According to the statement of the Deputy Ministry of Environment of the Republic of Moldova, SEIS project objective represents one of the priorities of the Ministry of Environment and will be the corner stone for the activities within next period.

This report reflects the current situation in Moldova regarding inter-institutional cooperation and responsibilities, monitoring management and exchange of data, and public information for the main three priority areas identified within the project – water, air and waste. For report development official documents of the Ministry of Environment, State Environmental Inspection, State Hydrometeorological Service, Agency “Apele Moldovei”, Agency for Geology and Mineral Resources, National Bureau of Statistics, National Center for Public Health and other were reviewed.

In the Republic of Moldova environmental monitoring is a basic element of any environmental management system. The Republic of Moldova has an environmental monitoring system covering ambient environmental quality, state of natural resources like soils, forests and wildlife, and pollution emissions and discharges. The Ministry of the Environment plays a key role in environmental observations and data collection. As agreed at the First session of the “Environment and Climate Change” Panel that took place in March 2011, the priorities of the Ministry of Environment (MoE) will be the corner stone for the activities in fields of water, air and waste. In this context we present the main network of environmental quality monitoring stations in Figure 1, which are maintained generally by the State Hydrometeorological Service (SHS).

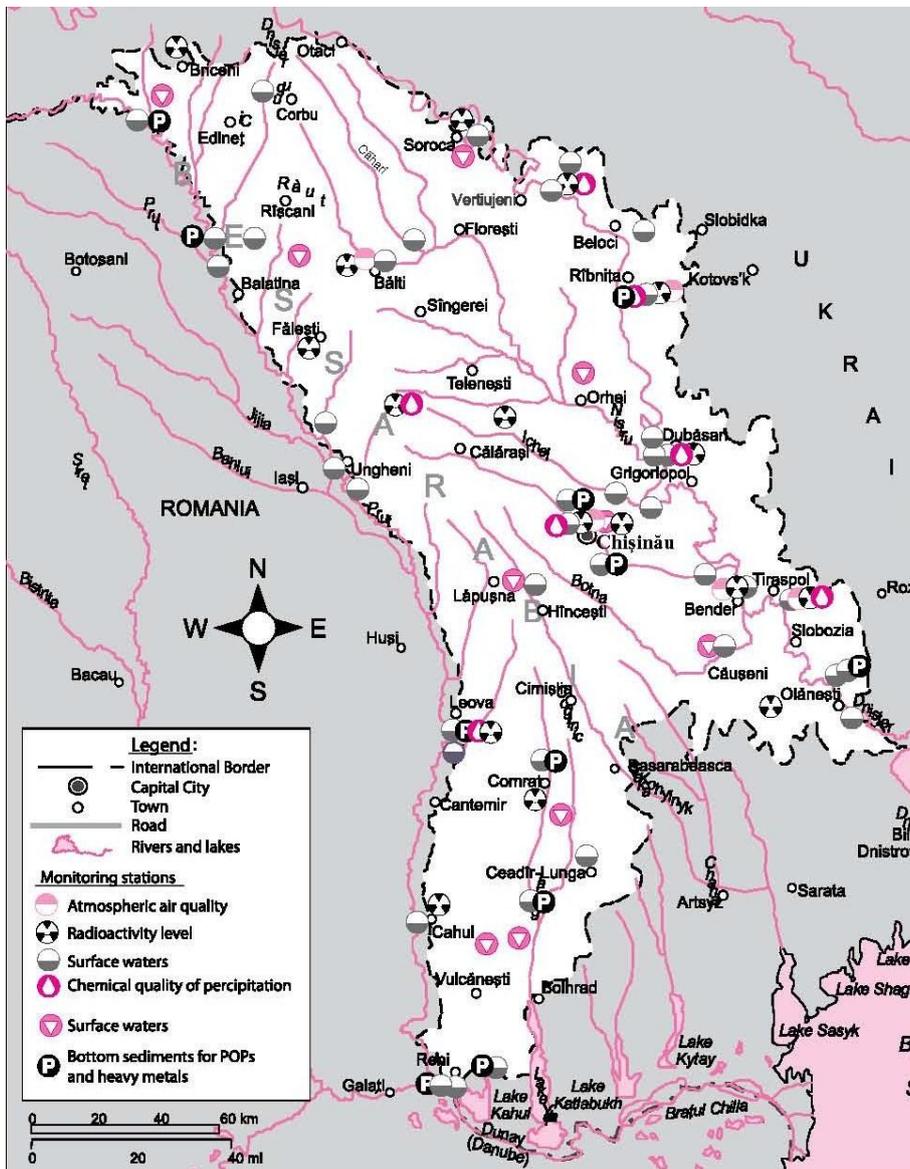


Figure 1.
The main network of environmental quality monitoring stations in the Republic of Moldova

Chapter 1 describes the current state of sectoral monitoring organizations and information systems that are implemented in Moldova. Here also are considered the responsibility for monitoring/information activities of the involved bodies, as well as existing environmental data flows. In the Republic of Moldova there are about 9 governmental bodies involved in environmental information collection, management, assessment and dissemination, including monitoring of environmental components for **water, air and waste**: National Bureau of Statistics, Ministry of Environment, Environmental Information Center, State Environmental Inspection, National Water Agency “Apele Moldovei”, State Hydro-meteorological Service, Agency for Geology and Mineral Resources, Institute of Ecology and Geography, State Service for Public Health.

Besides, the follow thematic offices were established for the implementation of national sectorial Strategies, Action Plans, international conventions and agreements and to facilitate the fundraising for these purposes: Biodiversity Office, POPs Office, Ozone Office, Biosecurity Office, Climate Change Office, Carbon Finance Office and Pollution Prevention Office.

Concerning environmental data flows there are two sources to collect the environmental information: (1) use of natural resources and environmental pollution, where can be listed the economic entities

that use/pollute the environment during their activity and (2) environmental monitoring activities that are undertaken by different governmental organizations (SHS, AGMR, Agency “Apele Moldovei” etc.).

Chapter 2 of the report describes the infrastructure of water, air and waste monitoring, including organizations involved in the monitoring and their main functions. In **water monitoring** field there is a well-developed stationary hydrological network formed of 46 stations spread across the whole territory of the country including Transdnistria for recording water level and water temperature. In transboundary Prut River basin there is a well-functioning system for regular data exchange between Moldova and Romania. Similar data exchange exists for the transboundary area of the Dniester River although there are no joint monitoring stations with Ukraine.

The systematic observations on surface water quality (of Dniester and Prut Rivers) is implemented through 49 monitoring sites set up on 16 large and small rivers, 5 reservoirs, 3 natural lakes and 1 estuary. At the informational posts are made measures at 8.00 a.m. and 20.00 p.m. daily. In case of floods, the observational regime is changed, data being collected each 4 hours.

There are also 5 automatic stations located on Raut River Basin, which provide hydrological information in real time every 4 hours.

The **monitoring of air** quality is implemented through a monitoring network formed of 17 fixed posts in 5 industrial regions. On a daily basis, three times per day there are collected samples of air pollution, which are analyzed by main parameters such as sulphur oxide, carbon oxide, nitrogen dioxide.

In 2007, there was established an automatic control station in Mateuți, which undertakes real time air monitoring activities: automatically monitored 15 parameters, out of which 10 atmospheric pollutants. The data on exposure to gamma rays and on 5 meteorological parameters are taken at this station too.

The national monitoring network of atmospheric *precipitation* chemistry is based on 6 quality indicators.

There are 18 weather stations and one on-line automatic station (in Mateuti) for assessment of the radioactive state of the environment.

It is important to mention that a **waste monitoring** network does not exist in Moldova, or we can say that there are in place only some elements of the required network. Mainly two organizations are involved in waste monitoring: MoE is responsible for waste data collecting and NBS is carrying out waste data dissemination.

Chapter 3 refers to the reporting obligations of the Republic of Moldova under multilateral environmental agreements at global, regional and sub-regional level. The Republic of Moldova is a party to several international conventions and agreements dealing with SEIS prioritized themes – water, air and waste.

This chapter also is offering references to environmental data availability on three topics. In particular, **hydrological monitoring data** for the period 1993-2009 are stored in a DOS program, being introduced in digital format. Since 2009 data are entered in an Excel format. The Agency “Apele Moldovei” holds a paper-based database on water use and discharges since 1983. Within the MCA Project “Irrigation Sector reform activity – RBM sub-activity” that is under implementation in Moldova, there was investigated possibility to convert the paper-based information to Windows interface, but the underlying database is still Dbase. Only data from year 2010 are available in Windows format. Other data used within the Agency are introduced in Excel format; the Agency “Apele Moldovei” does not have GIS capacity.

Air data for period of 1970-1992 is on paper base, information for period 1992-2005 is transferred in MSDOS program and data base for the 2005 - present is in Excel program. State Hydrometeorological Service stores, analyses and interprets the data on atmospheric air pollution received from the analytical laboratories and the data on the radioactive background collected from all

stations. This information is published in warning bulletins on exceptional pollution, bulletins on current quality of air covering the country territory. Also, the gathered information on air quality is presented on maps that are produced for 5 cities of the country. This information is available in Romanian language.

Waste data publishing in the annual Statistical Yearbook, also these data are available in electronic format on the website of the NBS. For the waste reporting procedure, there are used 3 statistical forms as: F 1 – “Generation and use of waste in enterprises and organizations”, F 2 – “Toxic waste” and F 3 – “Domestic waste in urban area”.

In **Chapter 4** analyzes are given on strengths and weaknesses for SEIS implementation in the Republic of Moldova. Among strengths are mentioned: (1) clear path for EU integration, (2) legal provisions for SEIS development and improved administrative and statistical system for environmental data collection, etc. Weaknesses includes: (1) poor inter-institutional cooperation, (2) unclear institutional framework for SEIS implementation, etc.

Chapter 5 proposes on future activities for collaboration within the ENPI-SEIS project. A list of priorities is included for the short and long term actions taking into account the national needs, especially those mentioned and discussed during the country visit. One of the main ideas would be getting support from the ENPI-SEIS Project in developing and participation in a Twinning Program for establishing of the Integrated Environmental Information Center that will host all the information (databases) gathered by all structures involved in the monitoring and information system process. Second proposal is development of a new legal document on Integrated Environmental Monitoring System in the Republic of Moldova, with support of the ENPI-SEIS Project, this representing one of the most important activities that could be implemented in the following period.

Another idea is participation in the real time monitoring activities of air parameters within the Air Watch Program.

I INTER-INSTITUTIONAL COOPERATION

1.1. Current state of sectoral monitoring organizations and systems

In the Republic of Moldova environmental monitoring is a basic element of any environmental management system. The environmental monitoring system of Moldova covers ambient environmental quality, state of natural resources such as soils, forests and wildlife, and pollution emissions and discharges. The Ministry of the Environment (MoE) plays a key role in environmental observations and data collection whereas the main network of environmental quality monitoring stations is maintained generally by the State Hydrometeorological Service (SHS). A number of other organizations are also involved in water, air and waste monitoring, data and information collection and management. Among main actors in the fields of water, air and waste are subdivisions of the Ministry of Environment, Ministry of Health and National Center for Public Health, Ministry of Agriculture and food Industry and National Bureau of Statistics. Each organization has a role in this process. However, there is no optimal level of coordination for data collection and management between those organizations. Thus necessary information exists in fragmented, incomplete and dispersed forms. As mentioned below, in the Republic of Moldova several organizations deal with monitoring of air, water and waste. A short general description of organizations which have combined functions for air, water and waste monitoring is presented below. Specifics about monitoring activities of these organizations are described under following sections on Water, Air and Waste together with activities of other organizations involved only in monitoring of one specific environmental media.

Ministry of Environment (MoE)

The Ministry of Environment¹ (MoE) is the central public authority responsible for development of legal and regulatory framework in the field of environmental protection, rational use of natural resources, including management of air, waste, water resources, water supply and sewerage system, ensuring compatibility of legal framework with Multilateral Environmental Agreements (MEA) of which Moldova is party, etc. In its task also are included establishment of an information management system, development of databases in its fields of competence, development of national records system on state of impact on atmospheric air, air pollution monitoring, waste monitoring, etc.

Some of the MoE functions and competences for water, air and waste are implemented by specialized bodies in its subordination: State Hydrometeorological Service (**SHS**), Agency “**Apele Moldovei**”, Agency for Geology and Mineral Resources (**AGMR**) and State Ecological Inspection (**SEI**).

Actually there is no information management system established the system that is acting now is implemented sporadically and based on the responsibility of Republic of Moldova under MEA, national legislation (Law on hydrometeorology, other), but no clear established information system exists. Concerning people involved in maintaining information system, for example, from 377 employees of the SHS, 65 employees are involved in monitoring, and particularly they are dealing with the whole process of environmental information management starting with data collection, processing, interpretation and information. In Agency “Apele Moldovei”, about 29 specialists are involved in this process now and they are working under 2 divisions – Basin Division for Water Management and Water Supply and Sewerage System.

The existing data bases within the SHS on water, air, soil and radiology are maintained by SHS. For example - till 1992 data for water are on paper based format, since 1992-2005 – in MSDOS format and since 2005-present in Excel. The same situation is for soil but data on air and radiology are still in MSDOS. These databases are not accessible to public. It is possible to access them after an official request addressed to the SHS and the data provided are the processed ones, not the primary data.

¹ More information on MoE activity can be found at: <http://www.mediu.gov.md/md/cond/>

Additionally seven so called “thematic offices” were created to support MoE in implementation of national sectorial Strategies, Action Plans, international conventions and agreements and to facilitate the fundraising for these purposes. They work on the project based approach and besides support for implementation of MEA they are tasked to establish and maintain relevant databases. In fact we can say that there is planned to establish such databases (for example, in the framework of the project “Improved coverage and management effectiveness of the protected areas system in Moldova” a draft plan for the biodiversity database is developed). In reality, “data bases” means the collecting of sectorial information, such as information on climate change, biodiversity, ozone, pops etc. (for example, inventory of the greenhouse gas emissions, biodiversity state, ozone pollution etc.). During implementation of some thematic projects, information included in country reports, strategies, etc. is collected on paper based format. There are no digital databases available yet. The list of thematic offices is presented below.

- Biodiversity Office (<http://bsapm.moldnet.md/>)
- POPs Office (<http://www.moldovapops.md>)
- Ozone Office (<http://www.ozon.md>)
- Biosecurity Office (<http://www.biosafety.md>)
- Climate Change Office (<http://www.clima.md>)
- Carbon Finance Office (<http://www.cfu.md>)
- Pollution Prevention Office

Information related to environment and health is collected by State Service of Public Health and managed together with Ministry of Environment.

Environmental Information Center (EIC)

EIC works under the supervision of the Ministry of Environment. It was established with Danish support in 2000. EIC holds an environmental research library and contains web sites of more than 80 national and international environmental institutions. According to EIC terms of reference, the Center shall focus its activity on establishment of environmental electronic databases for satisfy professional needs of decision makers, specialists in the field and public at large. Unfortunately, until now **there is no electronic database** established. This happens due to lack of funds, software, equipment, trained specialists.

State Hydrometeorological Service (SHS)

SHS is an institution subordinated to the Ministry of Environment, which is functioning according to the Law on hydrometeorological activity in the Republic of Moldova, No. 401 from 3 April 2003, adopted by the Government of the Republic of Moldova.

SHS task is to lead the environmental quality monitoring, especially of surface water, atmospheric air, environmental radiological state and soil quality. Also SHS is responsible to provide population, central and local public administration bodies, economic entities with hydro meteorological and environmental quality information. The national environmental monitoring system was established in 1980, main focus being on monitoring of environmental quality and determining of pollution levels, detecting high pollution of surface water, air and soil, preventing and mitigating the anthropogenic impact on the environment and population, and informing systematically the public on environmental quality.

Environmental Quality Monitoring Department (EQMD)

EQMD in the frame of SHS performs systematic ecological monitoring of the environmental components (surface water, air, soil, γ -radiation etc.) on the basis of the monitoring network established throughout the entire territory of the Republic of Moldova. The Department holds an Accreditation Certificate SNA MD CAECP LÎ 01 220 from 23 February 2010, according to international standard ISO/CEI 17025. The EQMD has 7 subdivisions:

1. Expedition Group (EG);
2. Surface Water Quality Monitoring Centre (SWQMC);
3. Soil Quality Monitoring Centre (SQMC);

4. Ambient Air Quality Monitoring and Radioactive Background Level Centre (AAQMRBLC);
5. Ambient Air Quality Monitoring Division Balti city (AAQMD);
6. Physical-Chemical Analysis Center (PCAC);
7. Center on Integrated Ecological Monitoring and Informational Management (CIEMIM).

State Ecological Inspection (SEI)

SEI is responsible for protection of natural resources, focus being on water, air and waste through issuing permits for special water use, water discharge and air pollution for economic actors. The SEI has 4 Environmental Agencies in Chisinau, Balti, Cahul, TAU Gagauzia and 31 territorial environmental inspections, located in each district of the country. Total number of SEI's employees being 326 persons, of which 59 works in central office and 267 in territorial offices. This activity is regulated by an internal decision that sets out the competences for issue of environmental authorizations (nr. 62 of 3 September 2008).

Until early 2011, the Central office of SEI issued permits for special water use and its four territorial subdivisions issued permits for water and air pollution for economic actors located in their supervised areas. From 2011, all permits are issued by the Central office. A permit is issued for a period of 5 years. In 2010, SEI registered 1297 water users from which only 632 have permits. Permits are issued following an approval on water use by other governmental organizations as: "Apele Moldovei" Agency, State Services for Public Health, Agency for Geology and Mineral Resources (AGEOM).

SEI monitors economic actors for permit compliance through regular monitoring and thus collects data for air pollution, water pollution and water discharge and waste disposal. SEI has the role of collection and validation of reports for waste and air pollution. The report on waste is passed later on to NBS and reports on ozone to the MoE. The main report on activity of the SEI is prepared yearly and is named "Environmental protection in the Republic of Moldova". This report is prepared in Romanian language and is published in print and also in electronic format on the website of the SEI and MoE. More information can be found at: <http://www.inseco.gov.md/>

Institute of Ecology and Geography (IEG)

Another organization involved in this process, under the MoE supervision is Institute of Ecology and Geography (IEG). IEG is in charge of the study of the dynamics and trends in geo-and ecosystems components under the influence of natural and anthropogenic factors, evaluation of factors which determine the occurrence of unfavorable geo-ecological situations and establishing the integrated information base for monitoring. More information about the Institute can be found at: www.ieg.asm.md

National Bureau of Statistics (NBS)

National Statistics system

NBS is the central statistical body subordinated to the Government of the Republic of Moldova, which conducts and coordinates the entire activity in the field of official statistics in the country, and works according to the Law on Official Statistics (nr. 412) adopted on 9.12.2004. According to its mandate, NBS is conducting and coordinating activities in field of statistics within the country. In the Bureau, responsibilities include development and adoption of methodologies for statistical research and establishment of indicators, approval of forms for reporting and data collection including for environmental sector. NBS is also in charge of dissemination of statistical information according to its Action Plan adopted by the Government of the Republic of Moldova.

Starting with 2009, based on bilateral cooperation between the NBS and MoE, a new system for data collection on environmental statistics was established. The system specifically established the responsibilities of institutions such as SEI within the MoE, which through its territorial representatives presents the list of economic entities that operate in the region to regional statistical offices. NBS together with MoE developed and adopted in 2009-2011 a common decision that foresees adoption of 7 new templates on environmental data reporting that refer to expenditures for environmental

protection, geological data reporting, water use, air, toxic waste, municipal waste, ozone. Among these forms, 2 have statistical and 5 administrative statute.

The NBS ensures printing of the reporting forms and is in charge of their distribution to economical entities that have to report on their activity, according to the list presented by SEI. The SEI collects the reports from economic entities, verifies the presented data and submits them to NBS or other institutions responsible for data processing as Agency "Apele Moldovei" (water use reports), Ministry of Environment (ozone report). The data are processed and published in the Statistical yearbook that is published in Romanian, Russian and English versions and is also available in PDF and Excel format.

In 2010, NBS prepared and published the statistical book on "Natural resources and environment of the Republic of Moldova" that represents the first publication in the field. It is prepared based on the statistical reports received from economic entities and based on administrative data received from the ministries and other central public authorities of Moldova. This report contains data on protection of atmospheric air, use of water resources, production and use of production and consumption waste, other environmental information. The report also contains information on demographical situation, population health, some economic indicators. It is available in print and electronic forms. More information on the Bureau activity can be found at: <http://statbank.statistica.md/pxweb/Database/RO/databasetree.asp>

Cooperation with E-Governance

The EU integration goal of the Republic of Moldova is very ambitious and its implementation requires a very close cooperation of all stakeholders. Thus, establishment of information systems, promotion of e-governance approach, ensuring public access to environmental information are important tools that could facilitate the integration process. The Government of Moldova has started actions in this aspect and in 2010 the E-Governance Centre was established. The key objective of the Center is to make accessible the synchronized databases from different sectors not only to decision-makers but to the general public as well. The E-Governance Centre on an annual base is launching a call for project proposals on electronic services. This competition is addressed to all central public administration bodies. In this regard, a template for project proposal was developed that includes the following information: project title, title of e-service, description of e-service, project objective, functionality of e-service, other e-services that can interact, individual beneficiary, organizations involved in implementation, required equipment, cost of e-service, specialists training needs that will implement the project, preliminary implementation plan, risks/opportunities, risk management, evaluation and monitoring of e-service and sustainability of e-service. The procedure of project financing includes: an invitation for participation in competition is sent to all institutions, the audit phase (evaluates capacities including IT), submission of project proposal itself, evaluation phase and approval of the best project proposals. Approval is done by the Coordination Council for E-Transformation. MoE participated in the current year competition, with deadline for project submission 1 of September. MoE submitted 3 project proposals as: 1) Monitoring of environmental authorizations issued by SEI, 2) Electronic system for notification of nuclear and radiological activities with purpose of their authorization, 3) Online access on data and certificates regarding data. The result of the competition is not known yet. In order to be more competitive in process of E-Governance project writing. ENPI-SEIS project support would be appreciated.

1.2. Responsibilities for environmental data

In the Republic of Moldova there are 9 governmental bodies involved in environmental information collection, management, assessment and dissemination. Below are described the structures in charge of environmental protection issues, including monitoring of environmental components for ***water, air and waste***.

In order to better understand the relations between the governmental institutions for environmental information exchange, the following a table the responsibilities of each organization for reporting on environmental data summarizes.

Table 1.
Inter-institutional cooperation in environmental sector

Institution	Environmental Sector	Responsibilities		Inter-institutional cooperation for data exchange
		Information	Monitoring/Research	
National Bureau of Statistics http://statbank.statistica.md/pxweb/Database/RO/databasetree.asp	Water, air, waste	Dissemination of statistical information according to its Action Plan adopted by the Government of the Republic of Moldova. Starting with 2010 NBS is preparing the statistical report "Natural resources of the Republic of Moldova", based on statistical and administrative reports.	Development and adoption of methodologies for statistical research and establishment of indicators, approval of forms for reporting and data collection including for environmental sector	Receive information and data from State Ecological Inspection, Agency "Apele Moldovei", State Hydrometeorological Service, State Service for Public Health and send to Ministry of Environment
Ministry of Environment http://www.mediugov.md/	Water	Ensure the establishment and management of information systems and databases in its fields of competence, maintain the statistics on state and quality of surface water resources, provide evidence of water resources and ensure maintenance of State Water Cadaster.	Development and promotion of state policy in the field of environmental protection, rational use of natural resources, waste management, biological diversity conservation, researches in geology and soil protection, management of water resources, water supply and sewerage system, regulation of radiological and nuclear activities, state ecological control, hydrometeorology and environmental data monitoring. These responsibilities are implemented through its subordinated institutions.	Receive information and data from State Ecological Inspection, Agency "Apele Moldovei", institute of Ecology and Geography, Agency of Geology and Mineral Resources, State Hydrometeorological Service, as well as receive processed data from National Bureau of Statistics and send to Environmental Information Center Ministry of Environment cooperates with State Service for Public Health on water issue for example setting out the key target indicators for water in context of implementation of the Water and Health Protocol, other Conventions.
	Air	Ensure the establishment and management of information systems and databases in its fields of	Issue the authorization for the import and export of the substances that deplete the ozone	Receive information and data from State Ecological Inspection and State Hydrometeorological Service, as well as

		competence	layer. Has the role of data validation for ozone report.	receive processed data from National Bureau of Statistics and send to Environmental Information Center
	Waste	Ensure the establishment and management of information systems and databases in its fields of competence	Issue the authorization for waste management.	Receive information and data from State Ecological Inspection, as well as receive processed data from National Bureau of Statistics and send to Environmental Information Center
Environmental Information Center http://cim.mediu.gov.md/	Water, air and waste	Dissemination of information that was collected by Ministry of Environment and its subordinated institutions.		Information is received directly from Ministry of Environment
State Ecological Inspection http://www.inseco.gov.md/	Water	The main report on activity of the SEI is prepared yearly and is named "Environmental protection in the Republic of Moldova" that contains information on water, air pollution and waste. Conduct national initiatives on water issue as "Water-spring of life", Clean river from Village to village", main scope being public awareness and participation in water protection issues.	Issuing authorizations for special water use, implement control of environmental legal framework enforcement, apply penalties for law breaking. In the context of statistical reporting on environmental protection, SEI has the role of data collection and validation for waste and air pollution, which is passed on later to MoE (for ozone) and NBS.	Receive information and data from all enterprises, organizations and economic entities; from Agency "Apele Moldovei", Agency for Geology and Mineral Resources, State Service for Public Health (this information exchange relates more to process of issuing the authorization for water use. The listed organizations shall submit their opinion on the request for water use, based on which the SEI is issuing or not the authorization, unfortunately the collaboration is limited to such information exchange. Also, there is a collaboration between these institutions during the development of the national Report on State of the Environment) and send it to Ministry of Environment and National Bureau of Statistics
	Air	Lead the annual European initiative "In city without my car", focused on air protection issues.	Development of annual allowed norms for pollutant emissions into the atmosphere from fixed and	Receive information and data from all enterprises, organizations and economic entities (all gathered information is included

			mobile sources, Keeps records and implements the inventory of enterprises /organization that pollute the atmosphere.	in the annual report on “Environmental protection in the Republic of Moldova”) and send it to Ministry of Environment and National Bureau of Statistics.
	Waste	Organize and lead the national competition “The greenest, cleanest and most developed locality”, main purpose of which is to keep clean our localities, inform on negative impact of waste to people health and environment.	Undertakes legal enforcement on production, transport, use or elimination of waste. Collects and validates the reports on waste.	Receive information and data from all economic entities and send it to National Bureau of Statistics (all gathered information is included in the annual report on “Environmental protection in the Republic of Moldova” that is sent to the Ministry of Environment)
Agency “Apele Moldovei” http://www.apelemoldovei.gov.md/	Water	Besides MoE, information on water use is presented to Ministry of Economy, National Bureau of Statistics and based on request it is also presented to Design Institute “Acvaproiect” and Institute of Ecology and Geography of the Academy of Science of Moldova. Participates in development of the State Water Cadaster	Development and implementation of water management resources policy, hydro-amelioration and water supply and sewage system services in Moldova. Agency is responsible for collection and data processing on water use for statistical reports.	Collected information and data is sent to State Ecological Inspection, Institute of Ecology and Geography, Ministry of Environment, National Bureau of Statistics

State Hydrometeorological Service www.meteo.md	Water	<p>Inform population, central and local public administration bodies, economic entities on hydro meteorological data and environmental quality information, undertake state control on use of hydro-meteorological information. Participation in information exchange at global level on hydro-meteorological observations and reporting under the hydro meteorological and environmental quality monitoring conventions and agreements.</p> <p>Participates in development of the State Water Cadaster</p>	Is in charge of undertaking monitoring on hydrological regime, air quality for the entire territory of the country.	Collected information and data is sent to National Bureau of Statistics. State Hydrometeorological Service collaborate with National Bureau of Statistics for the indicators development on air, temperature and precipitation
	Air	<p>Systematically elaboration of forecasts on air quality in the monitored localities and determines the character of interaction between the atmospheric air and meteorological conditions;</p> <p>development and transmission of warnings about the eventual changes of the air quality level;</p> <p>development of recommendations for the work regime of relevant enterprises during the unfavorable meteorological conditions.</p>	Develop the indicators on air quality, use of ozone depleting substances, temperature, etc.	Collected information and data is sent to National Bureau of Statistics, as well as to World Meteorological Centre in Moscow.
Agency for Geology and Mineral	Water	Participates in development of the State Water Cadaster	Promoting state policy in the field of management and monitoring of underground resources in Moldova, including water, in order to make	Send just the opinion on request for water use authorization to State Ecological Inspection

Resources http://www.mediu.gov.md/md/asg/			estimations of groundwater reserves, as well as monitoring of ground water quality and regime. Take part in process of issuing the water use authorization by approving the authorization application.	
Institute of Ecology and Geography www.ieg.asm.md	Water, waste, air	Contribute to evaluation and modernization of environmental informational system in Moldova and inform on main global and regional environmental problems, develop the National Strategic Action Plan for environmental protection in Moldova.	Develop and implement the Informational Geographic System for researches in field of environment	Cooperate with Agency "Apele Moldovei" and Ministry of Environment for the preparation of the national Report on State of the Environment
State Service for Public Health www.cnspl.md	Water	Provide information on drinking water pollution and quality in the centralized underground water sources to stakeholders and population.	Maintenance of state sanitary and epidemiological supervision system, monitoring of drinking water quality and pollution; carrying out regular inspections for violation and protection of satisfactory sanitary conditions;	Send information and data to State Ecological Inspection, Ministry of Environment, National Bureau of Statistics
	Air		Set out the norms for maximum allowed concentrations for air pollutants and their influence on atmosphere and human health.	Send information and data to National Bureau of Statistics

In spite of the fact that national institutions in charge for providing information on environmental components, especially on water, air and waste, are making efforts to fulfill these obligations in the best possible way, there is still poor cooperation experience at the institutional level. The exchange of information is fragmented, sporadic and is done on a limited basis. This situation definitely has to be improved by strengthening the legal framework on this issue and ensure legal enforcement. Nevertheless, in existing situation can be found good examples that have to be further developed and applied. One of the good examples of data exchange among institutions can be considered the procedure for development of State Water Cadaster. This process involves three institutions, each of them having joint responsibilities for elaboration and editing of the State Water Cadaster on an annual basis: the Agency "Apele Moldovei" (Water Basin Management Department), State Hydrometeorological Service, and Agency for Geology and Mineral Resources.

Another example can be the procedure on issue of water use authorizations that involves several governmental institutions such as SEI, Agency "Apele Moldovei", AGMR, SSPH. The role of these organizations is to give an approval for the application on water use activity, based on the results of analyses of proposed activity and its impact on water quantity and quality. Besides the existing special type of cooperation between these organizations, on other side, this procedure is a bit confusing. The applicant for water use authorization shall make more effort and spend more time while receiving the authorization due to the complicated procedure by visiting all mentioned institutions and waiting for their approval. This example also makes evident the fact that there is a case of overlapping responsibilities of different governmental institutions. It would be required to have clear separate functions of the institutions involved in this process.

Based on the conducted review for the Country report, can be concluded that none of the institutions involved/responsible for environmental information exchange is using a networked relational database for storing and exchange of data. There is a need to establish such a database on common platform principle.

In context of the above the ENPI-SEIS Project is considered as a potential instrument to assist in improvement of the cooperation level within the national institutions.

1.3. Environmental data flow

In the Republic of Moldova there are two sources to collect environmental information: (1) use of natural resources and environmental pollution, where can be listed the economic entities that use/pollute the environment during their activity and (2) environmental monitoring activities that are undertaken by different governmental organizations (SHS, AGMR, Agency "Apele Moldovei", etc.).

The scheme below shows the existing process of sharing data and information between the governmental organizations involved in the process of environmental management.

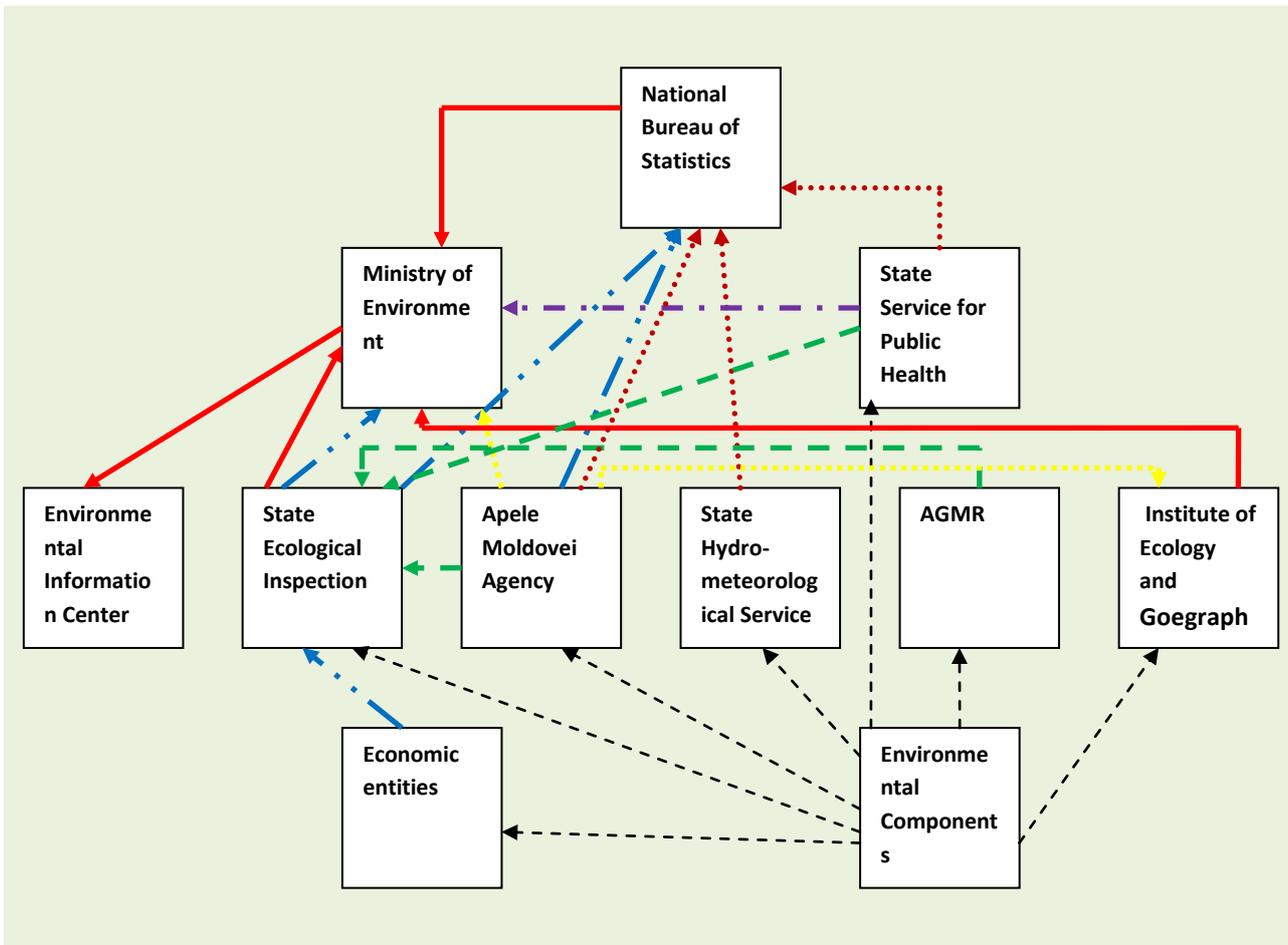


Figure 2.
Scheme on data flow
Legend on inter-institutional cooperation

Use of environmental components (water, air, soil) –	----->
Reporting on environmental components use/pollution –	- . . .>
Cooperation for development of indicators (water quality, quantity, air, temperature etc.) –>
Dissemination of information on water use –>
Exchange of information on water for issuing the authorization on water use -	- - - ->
Cooperation on implementation of Water and Health Protocol –	- . . .>
Dissemination of information on natural resources use, state of environment -	----->

II INFRASTRUCTURE

2.1. Water monitoring

There are 5 organisations dealing with water monitoring in Moldova. All of them are subordinated to the Ministry of Environment. Table 2 presents a short overview of main monitoring functions of these institutions. The rest of the chapter describes each organization in more detail.

Table 2.

Organizations involved in water monitoring in the Republic of Moldova and their main functions

Name of organization	Monitoring function
State Hydrometeorological Service (SHS)	Water availability and surface water quality Hydrology and hydrochemistry
State Ecological Inspection (SEI)	Water discharge and water pollution from economic actors (within permitting system)
Agency for Geology and Mineral Resources (AGMR)	Groundwater quality and regime
The State Service of Public Health (SSPH)	Drinking water quality, chemical and microbiological water pollution, bathing water quality
The Agency "Apele Moldovei"	Water use and water discharge by economic actors

State Hydrometeorological Service (SHS)

Water quantity monitoring

SHS is responsible for establishment and management of the National Fund of **hydro meteorological data**. SHS also monitors surface water quality. SHS undertakes observations on hydrological regime on the entire territory of the country. This task is ensured through a well-developed stationary hydrological network formed of 46 stations of which 7 are emplaced on the Prut River, 8 on the Dniester River and 1 on the Danube River. The rest of them are spread on the whole territory of the country including Transnistria. All 46 stations record **water level and water temperature**. The stations set up on the Prut River are managed by SHS, in transboundary area they are jointly managed with Romania. There is well functioning system for regular data exchange between both countries. Similar data exchange exists for transboundary area of the Dniester river although there are no joint monitoring stations with Ukraine.

Water quality monitoring

Surface Water Quality Monitoring Centre (SWQMC) monitors **water quality of Dniester and Prut Rivers**. It was established in 1964. SWQMC should ensure systematic observations on surface water quality. This is implemented through 49 monitoring sites sections set up on 16 large and small rivers, 5 reservoirs, 3 natural lakes and 1 estuary.

Water monitoring is supported by the stationary hydrological network that comprises 2 hydrological stations placed in Balti and Dubasari and 46 hydrological posts on the rivers Prut - 7 and its affluent – 6, on the Dniester River - 8, on its affluent – 14, on rivers with direct flow into the Black Sea – 2, including on the lakes and reservoirs Stinca-Costesti – 4 and on Dubasari lake – 3 and 20 informational posts. Beside mentioned, measures of discharge and level of water at 8.00 a.m. and 20.00 p.m. are done on a daily basis. Received data are passed to the Telecommunication Center next day at 8.00 a.m. In case of floods, the observational regime is changed, data being collected each 4 hours.

Water levels are recorded by an observer from a number of metal posts placed in the river a few centimeters above the water.

SWQMC laboratory has the following equipment that is used in water quality investigation:

- Spectrophotometer UNICAM 969 that determine copper, chromium, cadmium, lead, zinc nickel;
- Analytikjena mercury analyzer, which determines mercury;

- GS-MS Agilent 7890/5975 C, determine chlororganic pesticides, polyaromatic hydrocarbons, phthalates, nonilfenolii and their isomers;
- CARY spectrophotometer that determine phenols, petroleum products, total phosphorus and minerals, detergents, nitrates, silica;
- KФK2 determines sulphates, KФK-3 the total iron determinants;
- Determine sodium and calcium PFK;
- Lonometru ЭВ-74 block titration with BAT - 15 to determine alkalinity;
- ВЛР weighing 200 - serves for total suspension and weighed filters for reactive substances;
- Centrifuge ОПН provide preliminary filtration of water for analysis.

Also the portable equipment for surface water quality assessment is included in this laboratory, namely:

- Portable analyzer WTW multi 340i that determines the oxygen dissolved in water, water conductivity, temperature, water saturation with oxygen;
- Portable analyzer Multi 340I/SET, evaluating the same parameters;
- Spectrophotometer TURB 430IR/SET that determine water turbidity.

The laboratory has accreditation, compatible with the requirements SM SR EN ISO/CEI 17025:2006. Thus the laboratory of SWQMC has the permit to undertake activities related to surface water investigation. The gained accreditation is available for the period 2010-2014.

The laboratory has been supplied with new equipment, thus in 2009 was made the acquisition of Analytikjena mercury analyzer and in 2007 – the spectrometer UNICAM 969 for determination of heavy metals.

SHS stationary hydrological network also includes 5 automatic stations located on Raut River basin at: Balti, Cubolta, Jeleboc, Sevirova, Telenesti. These automatic stations provide hydrological information in real time every 4 hours.

During the period 2004-2010 the SHS was equipped with automatic weather stations for all hydro-meteorological posts, hydrological and hydro-chemical posts including automatization of hydrological monitoring for the Raut River. In 2010 the Environmental Quality Monitoring Department of the SHS was supplied with modern equipment and laboratories also with a high performance chromatograph. But, there is still room for improvement, as not all SHS monitoring station are equipped with pressure transducers (a sort of equipment that allows registration of recording the water level) and real-time data passing equipment. Only 5 stations have been equipped with automatic level measurement and transmission equipment. To measure water flow in rivers, there are used current meters. SHS was recommended to upgrade this equipment.

Information use exchange and dissemination

SHS is participating in information exchange at global level on hydro-meteorological observations and reporting under the hydro-meteorological and environmental quality monitoring conventions and agreements.

The received hydro-meteorological information is used for development of hydrological and meteorological forecasts as well as for warnings. This information is also sent to World Meteorological Center in Moscow with purpose to ensure the global data exchange under the WMO commitments. In order to increase the veracity and competency of the analyses carried out in the laboratories, specialists from SHS each half of year participate in the external international laboratory control (Qualco Danube) organized in cooperation with the VITUKI Environmental Protection and Water Resources Research Institute, Hungary.

Collected hydro-meteorological information including water monitoring data is generalized and published in several publications such as “Year book on hydrology”, “Annual data on surface water regime and resources”, “State water Cadastre”. Recently was published the “Activity report for 2010”, that reflects the measures undertaken by SHS during the year of 2010. This report is prepared in Romanian and English languages, is available in printed form and can also be found in electronic format on the website of the MoE and SHS.

In the context of this section is reasonable to mention that within SHS are implemented the following projects: Moldo-Czech project "Flood Warning and River Monitoring System for the Prut River" (2010-2012), aiming to improve the technical basis for river monitoring system and warning of floods. Other project implemented by SHS – "Disaster and Climate Risk Management" project oriented to reduce the country's vulnerability to natural risks. More information on activity of SHS can be found at: www.meteo.md

The existing data on water, air, soil and radiology, since 1993 to present are stores in Excel format.

The **State Ecological Inspection (SEI)**

Water discharge and water pollution monitoring

Through a special investigation center SEI monitors compliance to water discharge requirements set up by the permits. The investigation center develops annual sampling programs for wastewater quality in order to monitor the demand for biochemical oxygen, ammonium, etc, at wastewater treatment plants.

Within the SEI are working three **Ecological Investigation Centers (EIC)** emplaced in Chisinau, Balti and Cahul and serve the entire territory of Moldova. The main task of the EIC is to collect samples and effectuate chemical analysis for: air, from the stationary pollution sources; surface water, waste water and rain water from enterprises, organizations and economic entities. Also within these laboratories soil investigation is undertaken, especially on soil pollution with toxic substances, pesticides, etc. 10 specialists are working in the Chisinau and Balti EICs and 3 specialists in Cahul EIC. The EIC is monitoring 29 biological waste water treatment plants, 4 electro-thermic plants, range of rivers as Dniester, Prut, Bic, Ichel, others. Also, within the Center is investigated the ecological situation at PECO stations and the equipment control of the mobile pollution sources at enterprises. Starting with 2001 the Center has been accredited for evaluation of products conformity according to national requirements. In 2009 the Center passed the latest accreditation. The evaluation was done in accordance with the requirements of international standard ISO /CEI 17025:2006 "General requirements for the competences of laboratories for calibration". The accreditation certificate is issued for a 4 year period (2009-2013). In accordance with this accreditation all three laboratories are obliged to develop the manual for management which contains the applying policy and system for maintenance of quality within the lab, requirements to calculate the uncertainty for each analyze, etc.

The EIC has the appropriate equipment to determine 16 indicators for air pollution including NO_x, CO₂, ammonia, sulphure dioxide, methane, dust, xylene, hydrocarbons, acetone, hexane, benzene, ethylic ether, butyl alcohol, acetic acid, 27 indicators for waste water - temperature, pH, chemical oxygen demand, biological oxygen consumption, suspended matter, dry residue, total hardness, chlorides, sulphates, ammonium, nitrate, nitrite, phosphate, grease, petroleum products, anionic detergents, dissolved oxygen, calcium, magnesium, sodium, potassium, heavy metals. For soil there are investigated 10 indicators - pH, humus, fixed residue, cations and anions in watery extract, nitrate, ammonium, mobile phosphorus and potassium, petroleum products, grain component. The measurements in air samples are done through the following methods – with gas analyzers, express with the use of indicator tubes for determination of noxious and by chromatographic methods. Analyzes in water and soil samples are implemented by the following methods – gravimetric, titrimetric, spectrophotometric and chromatograph.

The EIC is equipped with following equipment: 4 spectrophotometers, 4 analytical balances, 4 technical balances, chemical reactive, and indicator tube. Actually the EIC has only 70 % of the required equipment. There is still need to buy additionally spectrophotometers, analytical weighing, gas analyzers for stationary sources of air pollution, chromatography, and environmental chamber/room.

The SEI has no database on issued water use authorizations, those being recorded by hand in a registry.

Agency for Geology and Mineral Resources (AGMR)

AGMR main responsibility is to ensure the rational use and protection of mineral resources and underground waters in Moldova. AGMR has 24 employees in two divisions and one section.

Groundwater quantity and quality

AGMR should ensure management and monitoring of underground resources in Moldova, in order to make estimations of groundwater reserves, as well as monitoring of ground water quality and regime. AGMR monitors physical-chemical parameters of underground waters and activates according to the requirements of the Subsoil Code (2009). The existing scheme for monitoring and assessment of groundwater resources was established in 1968. The water regime parameter monitoring is implemented through a state network formed of 180 underground wells emplaced in 33 localities. Water level is measured once every three days. The instruments used in this activity are roulette, thermometer and level measurements tools. The chemical characteristic of measured water after observations are important for further activities on natural resources exploitation and drilling of new wells. Received data are introduced in internal Excel spreadsheets which provide information on name of water source, quality parameters, abstraction rate, etc., unfortunately this database is not accessible to public.

Information use and dissemination

An interim report on groundwater status is prepared annually and the assessment report of groundwater resources – every five years. According to the National Report on the State of the Environment 2007-2010, during 2010 about 317367.50 m³ of drinking water was extracted from underground sources for consumption and about 70536.26 m³ of technical water.

Identified needs

AGMR need to be equipped with computers, software and modern instrumentation as well as the appropriate level of staff training is desirable.

The State Service of Public Health (SSPH)

SSPH is an agency subordinated to the Ministry of Health (MH) of the Republic of Moldova and represents the main organization responsible for maintenance of state sanitary and epidemiological supervision system.

Drinking water monitoring

SSPH is responsible for maintenance of state sanitary and epidemiological supervision system., including monitoring of drinking water quality and pollution, carrying out regular inspections to ensure compliance to sanitary requirements; providing monitoring and information to stakeholders and population.

The most important drinking water sources in Moldova are the Dniester River which provide 83% of water supply, Prut River has 1,8% and other surface water sources has 0,2%.

The water quality monitoring is implemented by the National Center for Public Health and 26 other Regional Centers for Public Health (RCPH). The surface water monitoring is undertaken through a monitoring network (samples collecting points) that is placed on the following Rivers: Dniester, Prut, Racovat, Raut, Bic, Ichel, Lunga, Ialpuș, Cogilnic and Cahul. Water samples are investigated for general conditions (temperature, oxygen in water, nutrients, salinity, acidification, etc.) and for microbiological parameters as well.

The water samples for surface water quality monitoring are processed in the laboratory of the NCPH that has the following equipment: photoclорimeter, thermostat, ionometer, gas chromatograph, thin layer chromatograph. Almost all this equipment is available in the RCPH as well. The NCPH laboratory is participating in several international comparison programs such as IMEP, UNEP; it also undertakes joint sampling exercises with similar structures in Ukraine.

The underground sources cover only 15% of the needs (data from the Environmental protection Report of the RM, 2010). The NCPH network on supervision and control for underground water involves almost 3000 artisanal wells and about 112 000 terrestrial well and springs. The monitoring

work on water quality in artisanal wells is difficult due to lack of records, wells protection, monitoring, evaluation, and research methods.

Regarding the technical capacity of the NCPH it has laboratories capable to analyze few organic pollutants. It is important to mention that there is need to improve the laboratories capacity for analyzing phosphorus components that are important parameters for the eutrophication process. In the framework of Sanitary-Hygienic component of the Dniester III project NCPH was one of two beneficiary laboratories for improving efficiency. Particularly, Finnish virologist from Helsinki University was invited to evaluate the situation on water sanitary and provide recommendations on improving laboratory efficiency. Taking into account the recommendations, doctors-virologists from Odessa and Chisinau laboratories had training in State Scientific and Practical Centre of Epidemiology and Microbiology Republic of Belarus (Minsk, Jun 2011). The doctors were trained on sanitary-virology control of the water and assessment of their epidemiological safety. Concerning laboratory capacity NCPH was provided with equipment and products, such us, installations for water samples from water sources; sets for collection and concentration of viruses from drinking water using trap devise; test-systems for antigen detection hepatitis A, enterovirus, rotovirus; reagents kits for PCR-diagnostic; environments for cell culture studies and sterile glassware.

The National Center for Public Health (NCPH) based on the Regulation on Sanitary norms for drinking water quality monitoring (adopted in 2007), is responsible for epidemiological state of surface waters and quality of drinking water. This is implemented based on 36 sanitary – chemical and 10 sanitary – microbiological parameters including virusological parameters and parasites. There are investigated the microbiological parameters.

According to the monitoring results for 2008-2010, about 40% of samples taken in the surface water springs mentioned above do not correspond to hygienic requirements, based on the statistical report 1- water management, the main source of population water supply are the surface waters. As mentioned in the State of the Environment Report (2007-2010), the water pollution index for Prut River did not change significantly in 2010 and is included under the category II of pollution as well as waters of the Dniester River, which mean that they are clean.

Information use and dissemination

On a yearly basis, MoH subordinated institutions, including SSPH, are developing and publishing the Report on “Sanitary- hygienic condition an epidemiological situation in the Republic of Moldova” that comprise the effectuated analysis on sanitary–hygienic and microbiological indicators of centralized and non-centralized water supply including ground and surface water.

The SSPH together with MoE is responsible for implementation of the Water and Health Protocol in the Republic of Moldova. The target indicators for potable water quality, waste waters and improvement of water supply were developed within the joint working group established for protocol implementation that included representatives of the different national and international institutions, as well as international experts. The brochure “Setting targets and target indicators in accordance with the Protocol on Water and Health in the Republic of Moldova” was published in Romanian and Russian languages and could be accessed through the at the link: www.cnsp.md.

Agency “Apele Moldovei”

“Apele Moldovei” Agency is a subdivision of MoE. It is a public authority responsible for development and implementation of water resources management policy, hydro-amelioration, water supply and sewage system services in Moldova. The Agency is setting up the water use limits based on technological needs. The “Apele Moldovei” Agency has 29 employees that work in two divisions.

Water use monitoring

“Apele Moldovei” collects and processes data on water use for statistical reports. The information on water use is collected based on statistical form nr.1 “water use” by the Water Basin Management Department. The form include fields on water use permits, data on water use limits and water withdrawals, etc. These forms are distributed to be completed among water users (economic actors)

recorded in the State Register, prepared by Basin Water Management Department. Based on this approach about 2495 report forms on water use have been filled in 2010.

Information use and dissemination

“Apele Moldovei” Agency holds the statistical evidence on water use based on above-mentioned forms. The annual report on water use according to form No1 “water management” include 3 tables:

1. Water collected from natural resources, water received from other enterprises (organizations), amount of used and amount of distributed water. This table includes the following **indicators** – water used for household purposes or as drinking water, for industry, at stationary irrigation systems, for agriculture, fishery, distributed to other consumers, transportation losses, measurements are done in thousand m³.

2. Water discharge. This table shows the volume of water discharge in thousand m³, including polluted wastewater, conventionally treated wastewater by special utilities, content of pollutants as petrol products, nitrates, dry residue, total nitrogen, oil, etc. The degree of water treatment shall correspond to requirements foreseen in Regulation for protection of surface water against pollution with residual waters.

3. Other indicators. This table is used to show supplementary indicators on water use that are not reflected in first and second tables. The main indicators presented in the third table are the annual water consumption with closed system of water supply as water supply systems, direct water use, water use with closed system, repeated water use.

Information use and dissemination

The collected and generalized information on water is distributed to the following governmental organizations: MoE, Ministry of Economy, National Bureau of Statistics and based on request it is also presented to Design Institute “Acvaproiect” and Institute of Ecology and Geography of the Academy of Science of Moldova. Agency “Apele Moldovei” takes an active part in development of the State water Cadaster together with State Hydrometeorological Service and Agency for Geology and Natural Resources. State Water Cadaster is an annual publication available only in paper version.

Relevant projects

Currently in Moldova under the MoE umbrella, several projects with the aim to improve water monitoring and information management systems are being implemented.

1. The Millennium Challenge Account (MCA) Project **“Transition to a performed agriculture”**, (2011-2015) is funded by Millennium Challenge Corporation (MCC). Project has 2 components – 1) transfer of irrigation management, 2) River basin management (RBM). For the first activity there is plan to create a Water Users Association, to rehabilitate 11 central irrigation systems, train specialists involved in irrigation system management, establish a national network (10 mobile stations) that will monitor in real time water quantity and quality. Second activity will cover the entire territory of Moldova, purpose being to offer support for RBM improvement. The project will contribute to improvement of monitoring network through purchasing of equipment for real time water quality monitoring, developing a GIS database, also, there will be organized trainings for Agency “Apele Moldovei” specialists. The new Law on water (that was adopted in the Parliament of the RM on 23 December 2011) will create the legal framework on implementation of the WFD and will define 2 districts – Dniester and Prut/Danube, thus there will be need to develop 2 RBM Plans. The MCC Project plans to develop a GIS system for one basin selected by the beneficiary.

2) Another project is funded by the French development agency **“Capacity building in data administration for assessing transboundary water resources in the countries of Eastern Europe, Caucasus and Central Asia (EECCA)”**, (2010-2012). The Dniester River basin is one of the 2 pilot areas of the project, the main aims of which are to support capacity building in data administration and data exchange within the main national and regional authorities concerned in order to develop the production of information necessary to better guide water resource management

decision-making, on the one hand, and to develop regional tools aiming to identify the available information, and to disseminate the results and experience feedbacks obtained in the pilot area, on another hand. There are 3 components of the project: (1) and (2) aim at developing capacities in data administration and sharing in the pilot transboundary area by using methodologies which could later be applied to other transboundary river basins in countries of Eastern Europe, Caucasus and Central Asia; (3) the third component regroups the actions planned at the regional level. this project is planned to be carried out in partnership with the plenipotentiaries of the bilateral agreement of 1994 on the Dniester and the involved national authorities.

3) “Reducing vulnerability to extreme floods and climate change in the Dniester river basin” (2010-2014) as a climate change component of the Dniester III project is being implemented under the Environmental and Security initiative (ENVSEC) and UN Water Convection’s program of pilot projects. The project’s aims to expand and further strengthen cooperative management in the Dniester river basin to address cross-border management of floods, taking into account both current climate variability and long-term impacts of climate change on flood risks in Ukraine and Moldova. The project deliverables are:

- Scenario- and modeling-based study of climate change impacts with a special focus on extreme floods in the Dniester basin
- Vulnerability assessment and production of flood hazard and risk/ vulnerability maps
- Improved / new automated flow monitoring stations (4 to 6; mainly on Ukrainian territory) and data exchange infrastructure
- Enhanced capacities and plans for flood risk communication on the sub-basin / local level
- Agreement and planning of further measures for flood risk reduction, and, if possible, implementation of selected small measures

4) “Information management system and infrastructures for the transboundary Dniester River basin” is a GIS component of the Dniester III project. The Dniester GIS project has been executed through 2008-2009 by national parties in Ukraine and Moldova (including the region of Transnistria), coordinated and supported by UNEP/GRID-Arendal. Through the project, a database with spatial data for basin-wide water management has been assembled from national and small-scale sources, for the transboundary Dniester river basin. The special website <http://enrin.grida.no/dniester/index.cfm> has been created. This website presents the resulting [spatial/GIS database](#) (including data for download), and map outputs from this database, both [interactive \(web-gis\)](#) and [downloadable graphic files](#). There is a big spectrum of information there:

- Basic and analytical information on hydrology (river basin districts, sub-catchments, river, lakes, chemical measurements stations, national water discharge)
- Administrative (marine coastline, international boundaries, sub-national boundary levels, settlements, roads, railroads)
- Climate (temperature, precipitation)
- Population
- Protected areas
- Seismology
- Land cover
- Soil types and proportions
- Elevation (topography / DEM)
- Satellite imagery

2.2. Air monitoring

There are 3 organizations dealing with air monitoring, 2 of them are under subdivisions of MoE, the third one is under the Ministry of Health. The main air monitoring actors and their functions are presented in Table 3.

Table 3.

Organizations involved in the air monitoring in Republic of Moldova and their functions

Name of organization	Monitoring function
State Ecological Inspection (SEI)	Negative impact on atmospheric air, air pollution, monitoring of air quality
State Hydrometeorological Service (SHS) Ambient Air Quality and Environmental Radioactivity Monitoring Centre (AAQEMC)	Atmospheric Air Monitoring, Precipitation Monitoring, Assessment of the Radioactive State of the Environment
The State Service of Public Health (SSPH)	Air quality monitoring, norms of polluted emissions

According to the Governmental Decision nr.847 of 18.12.2009, the responsibility of the MoE for air protection, especially development of national records system on state of negative impact on atmospheric air and air pollution monitoring, is implemented through its subdivisions SEI and SHS. The state control for protection of atmospheric air is ensured by SEI and SSPH according the provisions of the Law on air protection, nr. 1422-XII of 17.12.1997. SEI is also in charge of collecting and examination of the statistical reports on air that is sends to NBS.

State Ecological Inspection (SEI)

Air pollution by stationary and mobile sources

SEI is responsible for issuing authorizations for air pollution. According to the internal decision adopted in this context, the central office of SEI is in charge of **calculation of pollutants emissions** into the atmosphere from mobile sources including: auto transport, railway transport, airlines, river transport. It also calculates the consumed fuel for transport utilities – gas, diesel, liquefied petroleum gas.

The volume of emissions of pollutants into the atmosphere from mobile sources in 2010 196,423.732 tons, 20,020.672 tons more than in 2009, including: 147,745.689 tons – carbon oxides, 18948.210 tons - nitrogen oxides, 4645.089 tons - sulfur oxides, 2119.201 tons – hydrocarbons, and 5180.830 tons aldehydes.

Below is a graphic that shows the trend in atmospheric air pollution by mobile sources.

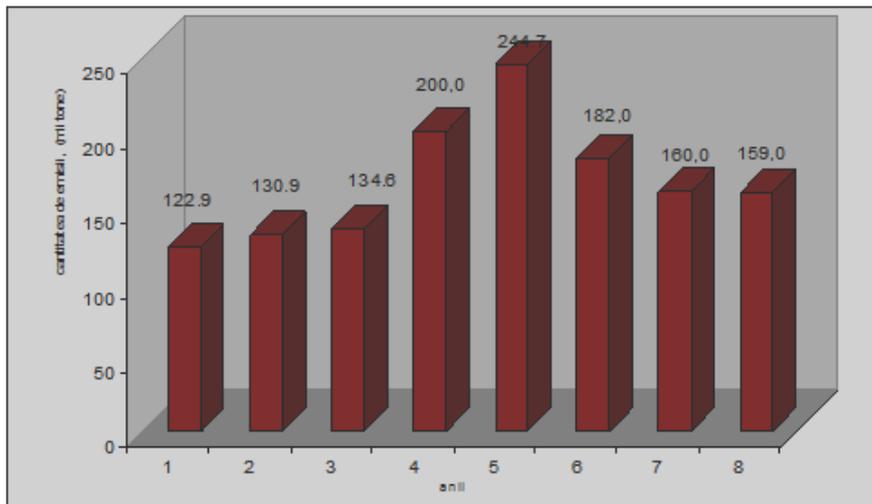


Figure 3.
Trend in atmospheric air pollution by mobile sources for the period 2001-2008
Source: State Hydrometeorological Service

Forecasts show that in 2010-2020, passenger and goods transportation needs and cars will double. This will negatively influence the atmospheric air quality. Volatile organic substances, persistent organic pollutants (POPs) and heavy metals are considered as toxic substances with a high degree of influence on the environment and, consequently, on public health in polluted communities.

5748 companies are registered as stationary air polluting sources in Moldova, 3 are power plants, 2777 boiler, 681 refueling stations. The total quantity of pollutants released into the atmosphere from stationary sources during 2010 amounted to 24,158.582 tons, including particulate matter - 4674.267, tons sulfur dioxide - 1659.527 tons, nitrogen oxides - 2526.304 tons, carbon monoxide - 6980.827 tons, hydrocarbons - 1785.105 tons, others - 3567.179 tons. The data presented are not complete, since Transnistrian enterprises are not included because the data is not available. An important tool for air quality regulation is the authorization system on pollutant emissions into the atmosphere. This requirement is fixed in the Law on air protection (nr. 1422-XII, 1997). Currently, it is known that from the total number of companies that are activate within the country, only 72,3% has authorization. Atmospheric air pollution during the years 1990-2010 shows a decreasing trend in the period 1990-2000 and an increase in the period 2000-2010, because for the first period there was a closure of enterprises but for the second period the number of cars increased in Moldova.

Collected information is also used for reporting under the relevant international conventions and is published in Romanian language in the Yearbook of SEI – “Environmental protection in the Republic of Moldova for 2010”. This report is accessible as paper as well as in PDF format on the website: www.mediu.gov.md

Norms for polluted emissions

SEI participates in development of annual allowed norms of pollutant emissions into the atmosphere from fixed and mobile sources, keeps the records and implements the inventory of enterprises and organizations that pollute the atmosphere.

In order to evaluate **air quality**, the Ministry of Health sets out the norms for maximum **allowed concentrations for pollutants** and their physical influence on atmosphere and human health. SEI is approving norms for admissible emission limits based on authorizations that are issued for pollutant emissions into the atmosphere. Authorization is issued for a period of 5 years. Currently, air pollution is one of the most serious problems in our country. Data on pollutant emissions are used for tracking pollution level, calculation of pollutant, emissions and establishing air quality data. Based on monitoring results for period 2007-2010, it is obvious that air pollution is increasing.

Ozone protection

SEI prepares the report on ozone protection - "Production, consumption, import/export of substances that are depleting the ozone layer, regulated by Montreal Protocol". The information for this report is collected from the economic entities by SEI specialists and after verification of data; information is presented to MoE Ozone Office for processing and generalization.

State Hydrometeorological Service (SHS)

Ambient Air Quality and Environmental Radioactivity Monitoring Center (AAQEMC)

Ambient Air Quality

The monitoring of ambient air quality in Moldova started in 1969 and is now implemented based on the following legal documents:

- Law on hydrometeorological activity (nr. 1536-XIII, 1998),
- Law on environmental protection (nr. 1515-XII, 1993),
- Law on atmospherical air protection (nr. 1422-XIII, 1997).

The SHS is implementing the monitoring of air quality through a network of 17 fixed posts emplaces in 5 industrial regions: Chisinau – 6, Balti – 2, Bender – 4, Tiraspol – 3 and Ribnita - 2. On a daily basis, three times per day samples of air pollution are collected, which are analyzed parameters such as sulphur oxide, carbon oxide, nitrogen dioxide. The ambient air quality activity is carried out based on the Guideline for atmosphere pollution control, developed in 1991.

Automated monitoring station located in Mateuti performs the electronic analysis of the air quality.

It is important to note that the laboratory is accredited according to ISO requirements only for the analysis station in Chisinau. **Transboundary air quality** analysis performed at Leova station has no ISO accreditation. In order to have a clearer picture of the pollution of the atmosphere, there is a need to purchase and install in Chisinau an automatic station to investigate the air quality similar to the one in Mateuti. Also it is needed to do automatic monitoring for industrial pollution, pollution from mobile sources. It is required that the monitoring process be a continuous one.

Collected information on air pollution in transboundary context is presented yearly to Norway Institute for Atmospheric Research in accordance with the requirements of the LRTAP convention. Also, information on air temperature each month is presented to the Global Center on Climate Data (USA), European Center on climate data (Germany) and Regional Meteorological Center (Russia).

Information on atmospheric air pollution by stationary and mobile sources is used for development of the National Report "State of the environment in the Republic of Moldova" and is also included in the Statistical Yearbook. These reports are available in Romanian and English languages on paper and electronic format and are placed on the website of the NBS and MoE. Also, pollution data and forecasts for the next two days on atmospheric air pollution are included in the daily bulletin prepared by SHS. These bulletins contain information on maximum concentrations for nitrogen dioxide, formaldehyde and solid suspension. Bulletins are prepared in Romanian language and are published on the web site of the SHS <http://www.meteo.md/mold/nsqilca.htm>

Precipitation monitoring

Precipitation monitoring is carried out at meteorological stations in Chisinau, Cahul, Cornesti, Balti and Leova. Data on air monitoring are used for development of the SHS "Activity report", Samples on air pollution that are collected three times per day (7⁰⁰, 13⁰⁰, 19⁰⁰).

Starting with the fourth trimester of 2011, there will be initiated monitoring of particulate matters PM₁₀ and of other inorganic components of POP (Persistent Organic Pollutants). The requirements for determination of particulate matters PM₁₀ are mentioned in the requirements of Framework Plan regarding the development of particulate matters monitoring with the fraction PM₁₀ and PM_{2,5} fÎm in the countries of Eastern Europe, Caucasus and Central Asia (EECCA). This Plan was developed by the World Health Organization.

Radioactive monitoring

The AAQEMC is also responsible for assessment of the radioactive state of the environment. Starting in 1978, systematic observations on the level of exposure of the γ -irradiation are carried out twice per day (7^{00} and 20^{00}) at 18 weather stations (in the northern part – 7, in the central part – 7, in the southern - 4), as well as on-line at the Mateuti automatic station.

SHS is involved in implementation of the LRTAP Convention. In 2007 there was reestablished the transboundary pollution control station in Leova. Now there are undertaken real time observations of ambient air quality in line with EMEP Program (European Monitoring and Evaluation Program), level I and level II. Starting in 2010, with the support of Norwegian Institute for Air Research (NILU), there have been initiated investigations regarding elementary and organic carbon determination based on particulate matter PM10. The centre also takes additional observations of anthropogenic radionuclide ^{137}Cs , ^{90}Sr (cesium-137, strontium-90), summarily activity γ - β in the atmospheric deposits, as well as determining of the telluric radionuclide composition in the soil ^{226}Ra , ^{232}Th , ^{40}K (radium-226, thorium-232, calium-40). Also, since 2009 the investigation of radioactive aerosols in the ambient air was initiated by installing a station (ASS-500) in Chisinau.

2.3. Waste monitoring

It is important to mention that a waste monitoring network does not exist in Moldova, there are in place only some elements of the required network. Mainly two organizations are involved in waste monitoring.

Table 4.

Organizations involved in waste monitoring in Republic of Moldova and their functions

<i>Name of organization</i>	<i>Monitoring function</i>
State Ecological Inspectorate (SEI)	Collection and verification of the waste data
National Bureau of Statistic (NBS)	Processing, publishing and spreading of the waste data

State Environmental Inspection (SEI)

Waste data collecting

The MoE is in charge of developing and implementing the **waste policy** within the country. The SEI subordinated to MoE, according to its responsibilities has to supervise and control enforcement of the environmental legal framework for economic entities including the waste sector. The system of official statistics in field of waste management is established by the Law on official statistic no. 412-XV of 9 December 2004, Law on environmental protection no. 1515 of 16 June 1993 and Law on production and household waste no. 1347-XIII of 9 October 1997. Thus, Form 1- "Waste generation and use of waste" and Form 2 "Generation, use and disposal of toxic waste" have to be filled in by all economic entities that work in the field of waste management and submitted to SEI. The received information regarding **waste management** is validated by SEI specialists and then it is sent to NBS. The Form 3 "Domestic waste in urban area" is filled in by waste collection companies and is sent directly to NBS.

In the forms is shown: the availability of waste at the beginning of the year, waste generation, income, use, transfer, waste eliminated or removed to landfill and the balance at the end of the year.

Form 1 "**Waste generation and use of waste**" includes the following information:

- Title and availability of waste at the beginning of the reporting period;
- Waste;
- Admission and use of waste;
- Delivery, including for export;
- Elimination or removal to landfill;
- Available at the end of the reporting period.

Table 5.
Generation and use of waste in enterprises and organizations by type and movement of waste, 2010

<i>Type</i>	<i>Existing at the beginning of the year</i>	<i>Generated</i>	<i>Inputs</i>	<i>Used</i>	<i>Supplied</i>	<i>Destroyed or transported to dumps</i>	<i>Existing at the end of the year</i>
Waste – total	5847,9	1860,3	3253,0	1435,2	961,6	1511,5	7052,9
Waste of quarrying enterprises	5597,3	439,3	2073,9	1064,4	204,4	0,0	6841,7
Waste of livestock production	81,2	279,2	27,6	204,3	7,6	115,6	60,5
Waste of foodstuff and drinks production industry	38,0	368,8	4,8	23,6	198,4	152,3	37,3
Waste of housing and communal services and domestic waste	56,5	416,6	699,6	6,0	-	1102,8	63,9
Waste of inorganic chemistry	14,8	0,0	-	14,5	0,0	0,0	0,3
Waste of plant growing	2,8	37,5	0,7	17,9	5,1	15,3	2,7
Secondary raw material for ferrous metallurgy	9,7	8,6	148,1	0,7	148,3	0,2	17,2
Waste of forestry industry	4,6	11,2	-	2,9	8,6	0,5	3,8
Secondary raw material for non-ferrous metallurgy	0,6	0,2	6,7	0,0	6,4	0,0	1,1

Source: National Bureau of Statistics

Form 2 "**Generation, use and disposal of toxic waste**" includes the following information:

- Code group and type of toxic waste;
- Title;
- Technological Process, which produced toxic wastes;
- Chemical composition in%, aggregate state, the class of toxicity;
- Available at the beginning of the year;
- Formed waste, received from other companies in t., imported;
- Utilized (scrapped);
- Neutralized (eliminated);
- Exported (in storage, landfill);
- Transferred to other companies, exported;
- A year-end and place of storage.

Form 3 "**Domestic waste in urban area**" includes the following information:

- Transportation of solid waste, thousand cubic meter;
- Transportation of liquid waste, thousand cubic meter;
- Area of neutralization of domestic solid waste, hectare.
- Number of discharge tanks.

Economic agents / companies present annual reporting forms to the territorial statistical bodies by 25 January and 15 March each year.

Table 6.
Domestic waste in urban area, 2001-2010

Indicators	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Transportation of solid waste, thousand cubic meter	1101,9	1148,4	1143,5	1200,0	1268,5	1353,6	1790,6	2130,8	2210,2	2302,6
Transportation of liquid waste, thousand cubic meter	28,9	24,3	20,8	24,3	23,9	27,8	28,9	42,0	57,4	56,9
Area of neutralization of domestic solid waste, hectare	125,9	142,6	148,8	154,4	166,9	180,2	195,0	190,1	199,2	206,5
Number of discharge tanks	16,0	17,0	17,0	14,0	14,0	16,0	16,0	17,0	18,0	18,0

Source: National Bureau of Statistics

The SEI in cooperation with **Agency for Land Relations and Cadastre (ALRC)**, in order to make use of centralized data, of topographical, geodetic and mapping documents has been created **State Cartographical and Geodetic Fund**. This Fund is storing mentioned materials for the whole territory of the Republic of Moldova. The scale of the Fund map is 1:1000000, the following layers are included – cadastre, public infrastructure, borders of localities, environmental information (mineral resources, water basins, mines and carries, deposits of solid household waste, land parcels). These materials are of technical, scientific, economic, historical, social and cultural interest and can be found at: <http://www.mediu.gov.md/md/ies/>

National Bureau for Statistics (NBS)

Waste data reporting

According to the provisions of Law on production and household waste (nr. 1347-XII, 1997), enterprises that generate waste during their activity, have to present on annual base, a report on the quantity of generated, transported or disposed waste. According to the new decision, adopted by MoE and NBS in 2010, on approval of forms and reports on environmental protection, the procedure of data collection was modified. Thus, reports on waste are collected and processed by SEI, also information is validated and passed later on to NBS.

The National Bureau for Statistics is processing received information on waste from SEI and publishes reports which are distributed among central and local public authorities including MoE. Reports contain statistical data, inclusively regarding **accumulation, use and treatment of waste, including hazardous, etc.** With regard to statistical data it is important to mention that statistical records for waste is not sufficiently implemented and is not reflecting the real situation in the field. For example, there is missing the form for statistical reporting on trans- boundary movement of hazardous waste, this being coordinated within the country based on the Basel Convention requirements (ratified by the Republic of Moldova in 1989). The data on waste generated, used or disposed including toxic waste are published yearly in the Statistical yearbook, developed by NBS (<http://statbank.statistica.md/pxweb/Database/RO/01%20GEO/GEO04/GEO04.asp>) and are also used for development of the SEI Yearbook (<http://inseco.gov.md/informatii-de-interes-public/>).

Improvement of the waste legislation and procedures

The Republic of Moldova is making efforts to improve its legal framework - an activity that covers the waste sector as well. Thus, now under adoption procedure is the new Law on waste and the National Waste Management Strategy (NWMS). The NWMS has been developed by the Ministry of Environment, in accordance with the requirements of National Development Strategy. This Strategy is a key milestone in the transposition of European waste management practices in our country. It also

defines targets for reduction of the quantity of generated waste by introducing waste prevention and recycling measures and is promoting the integrated waste management approach.

MoE is in charge of issues and withdraws authorizations for waste management (article 4, letter b) of the Law on production and household waste No. 1347 of 9 October 1997. The licensing procedure for waste management is established by decision of the Ministry of Ecology and Natural Resources no. 20 of March 14, 2005. Also, according to the internal decision nr. 233 of 10.11.2003, MoE is issuing notifications for transboundary movement of waste including hazardous waste. Information on transboundary movement of waste is sent to the Secretariat of the Basel Convention.

The POPs Office under MoE supervision has benefited from several projects within which was developed a Management Information System (<http://pops.mediu.gov.md/>). Scale of the system is 1:1700000 and offers information on index of risk on POPs pollution, level of contamination, protection measures. Within the POPs office was developed the National Profile for chemicals management in the Republic of Moldova. Due to its considerable efforts, the Republic of Moldova at the V-th Conference of Parties in April 2011, in Geneva was highly appreciated as one of the first countries in the world to, get significant results in convention implementation and obtained two awards: the POPs Star Award for implementation of the convention and the Award for the elimination of the PCBs (PEN Network Award). During the first 10 years of implementation in Moldova more than 3350 tons of obsolete pesticides from 350 warehouses and 40 illegal dumps were collected, repackaged and stored in 35 centralized warehouses.

Also, within WG project that is implemented by the Pollution Prevention Office of the MoE, a new scheme on waste data collection and reporting has been proposed. As is foreseen in the new Law on environmental protection, there shall be created an Environmental Protection Agency (EPA). Since EPA will be set up, there is suggested the following scheme for data collection: the MoE will deal with policy development and would be responsible for establishing the EPA. SEI will keep its responsibilities on law enforcement and control, for data collection, monitoring of reported data, and establishment of environmental indicators, but data processing will be the responsibility of the EPA. NBS will be informed by the Agency on final results of reporting procedure and will deal with statistical data collection and report preparation. These changes are not adopted yet, since they require making an institutional reform and for its implementation there is need for technical assistance such as software, new equipment for data processing, training of the specialists that will be involved in data collection and processing, etc.

In order to improve future collaboration between waste monitoring actors, the following **problems** have to be solved:

- development of new reporting forms especially for the waste sector including hazardous waste, with support of Norway Statistical Office, development of new software for information processing,
- development and improvement of methodologies for establishment of statistical indicators on environment, first of all being need for indicators on expenditures for environmental protection,
- improvement of data collection procedure,
- Information distribution spreading.

III CONTENT

3.1. Country reporting obligations

3.1.1. Reporting obligations at national level

Under this section is worth to mention that in 1998 the Regulation on integrated monitoring system of the environmental components was developed and adopted. This document determines the structure,

rules of functioning, and institutional responsibilities in relation to integrated environmental monitoring system in Moldova. Besides its entering into force, this document is not yet applied. Nevertheless attempts were made to implement the Regulation, but this initiative was not supported by governmental organizations and now it is not functioning. As result, we can say that there are no procedures on environmental data sharing and exchange of information for the moment. Actually, the concept of the new integrated monitoring system is included in the new draft Law on Environmental Protection that is in the final stage for adoption by the Parliament of the Republic of Moldova. Also in this context, are included in the draft Law on water, Law on waste, Law on chemical substances, which also include the provisions of the EU legal requirements.

Taking this into account and acknowledging the importance of such legal document, we consider that the development of a new legal document for integrated environmental monitoring system is one of the most important activities that could be implemented with support of the ENPI-SEIS Project in the following period.

3.1.2. Reporting under Regional and Sub-regional MEAs

Reporting under Regional and Sub-regional MEAs. The Republic of Moldova has ratified 5 regional environmental conventions: Convention on Environmental Impact Assessment in a Trans boundary Context (Espoo); Convention on the Trans-border Effects of the Industrial Accidents; Convention on the Protection and Use of Transboundary Watercourses and International Lakes; Convention on Long-Range Transboundary Air Pollution; Convention on Access to Information, Public Participation in Decision-Making and Access to Justice in Environmental Matters. From the lists will be described only the relevant ones as:

1. ***The Convention on the Trans-border Effects of the Industrial Accidents*** (Helsinki, 17 March 1992), ratified through Parliament Decision no. 1546-XII dated 23 June 1993;

The NFP for this convention is SHS which undertakes many activities in order to implement the convention provisions in Moldova. SHS took measures to improve the risk management and climate related disasters by strengthening its technological and methodological capacity. In collaboration with the Government of the Czech Republic, there were installed 11 automatic hydrometric stations. Starting in August 16, 2010 SHS introduced the system of dangerous hydro meteorological phenomena warning codes with four colors (green, yellow, orange and red), a process carried out by adjusting the conditions of the international quality standards.

2. ***The Convention on Long-Range Transboundary Air Pollution*** (Geneva, 13 November 1979), ratified through Parliament Decision no. 399-XIII dated 9 July 1995; Also, Moldova have ratified 2 Convention Protocols – POPs (2002) and Heavy metals Protocol (2002). The Gothenburg Protocol was signed but is not yet ratified.

The NFP for CLRTAP is the SEI. In order to meet the provisions of the Convention and especially under the EMEP program, there are taken regular samples of atmospheric precipitation at the transboundary stations Leova and Chisinau, to determine heavy metals as Pb, Cd, Cu, Zn, Cr, Ni. To investigate these heavy metals was used the atomic-absorption spectral method.

Also, Moldova has benefited from international assistance within which in 2009 have been implemented with support of Czech Republic, the project “Support for implementation of CLRTAP in Moldova in context of Gothenburg Protocol”. The Project budget was 44.000 \$. Within project was ensured technical assistance for assessment of national legal and normative framework in context of regulation of air quality and identification of its correspondence with international legislation, consolidation of inventory quality and forecast of national emissions according the requirements of EMEP/CORINAIR Guidebook and EMEP Regulation for reporting of national emissions, and capacity enforcement for evaluation of integrated emissions modeling. In 2011 was launched the regional ENPI project „Air Governance in EECCA countries”, with a budget of 6,935 million Euro that will be

implemented in period of 2011-2014. Main project objective consists of improvement of sustainable management of natural resources, including diminution of climate change effects, and amplification of cooperation in this field. Also project will deal with convergence of national legal framework to European legislation on air quality and implementation of these provisions, increasing the information and awareness level through cooperation at regional and sub-regional level of decision makers, representatives of industry and civil society.

3. ***The Convention on Access to Information, Public Participation in Decision-Making and Access to Justice in Environmental Matters*** (Aarhus, 29 June 1998), ratified through Parliament Decision no. 346-XIV dated 7 April 1999;

The NFP for Aarhus Convention implementation is the MoE. In June this year Moldova hosted the fourth session of the Meeting of the Parties to the Aarhus Convention. By this event was developed and adopted the Action Plan for implementation of the Aarhus Convention in Moldova. The priority actions from the Plan are development of the Law on access to environmental information, development of communication strategies among the central public administration until end of 2011, strengthening of institutional capacities that are involved in generation, processing, spreading of information on environmental protection, establishment of the National Centre on integrated monitoring, and development of electronical environmental data bases, accessible to public. Other relevant information is that MoE is working now on development of the National Environmental Protection Strategy for 2012-2020. Main objectives of the Strategy are to optimize the data collection, processing and information system in field of environment, reorganize the monitoring, reporting system on national and international level and ensure access to environmental information. In regard to sectorial objectives, were mentioned the establishment and development of the environmental information system that includes development and maintenance of the databases, and use of the set of indicators in field of environment approximated to UN ECE and EEA requirements.

Reporting under Sub- regional MEAs. There are some other sub-regional MEAs of which Moldova is Party: Convention on the Wild Life and Natural Habitat Preservation In Europe; Convention on Cooperation for the Protection and Sustainable Use of the Danube River; The European Landscape Convention.

1. ***Convention on Cooperation for the Protection and Sustainable Use of the Danube River*** (Sofia, 26 June, 1994), ratified through Parliament Decision no. 323-XIV dated 17 March 1999;

The NFP for the Danube convention implementation is IEG. Under Danube Convention implementation has been undertaken an many activities as follows: concluded a Bilateral Cooperation Agreement between Republic of Moldova and Romania, based on which are undertaken investigations on water quality of the Prut River at 7 jointly established monitoring sections. There are analyzed 26 hydro chemical indicators and 3 groups of hydro biological elements.

Collaboration with Ukraine was developed on the same approach. Based on the bilateral agreement, water quality monitoring on Prut and Dniester rivers is done at 3 joint monitoring sections where 22 hydro chemical indicators are investigated. Also, the agreement foresees the mutual exchange of information and data on water quality of the Dniester and Prut rivers in the transboundary sections.

In the frame of the International Commission for the Protection of the Danube River, monitoring is carried out at 6 sections of the TransNational Monitoring Network (TNMN) on Prut River, where are analyzed 22 hydro chemical quality indicators and 3 groups of hydro biological elements. Monitoring of the aquatic alluvial deposits in the TNMN by is carried out by analyzing 21 quality indicators.

3.1.3. Reporting under Global MEAs

The Republic of Moldova has ratified and become party to 18 environmental conventions and 4 protocols, among which 10 are global environmental conventions as follows:

1. Convention on the Biodiversity;

2. UN Framework Convention on Climate Changes UNFCCC;
3. Convention for the Protection of the Ozone Layer and Montreal Protocol on Substances that Deplete the Ozone Layer;
4. Convention on the Control of Trans boundary Movements of Hazardous Wastes and Their Disposal;
5. UN Convention to Combat Desertification;
6. Convention on Wetlands of International Importance especially as Waterfowl Habitat (Ramsar);
7. Convention on the Conservation of Migratory Species of Wild Animals (Bonn);
8. Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES);
9. Convention on Persistent Organic Pollutants;
10. Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade.

The most relevant global conventions in context of the SEIS project priorities (water, air and waste) are the following:

1. **UN Framework Convention on Climate Changes, UNFCCC** (Rio de Janeiro, 12 June 1992), ratified through Parliament Decision no. 404-XII, dated 12 June, 1995; Under this convention Moldova has reported twice in 2000 and 2010. First national communication of the Republic of Moldova was referring to period 1990-1998, second communication was covering the period 1990-2005. The third national report is under development and will cover the period 1990-2010. MoE has established a unit for implementation of the UNFCCC, thus being institutionalized the Climate Change office (www.clima.md) that is the responsible body for implementation of the convention in the Republic of Moldova. More information on the results of implementation can be found at: http://unfccc.int/essential_background/library/items/3599.php#beg

2. **The Convention for the Protection of the Ozone Layer** (Vienna, 23 March, 1995), Montreal Protocol on Substances that Deplete the Ozone Layer (Montreal, 16 September 1979), ratified through Parliament Decision no. 966-XII dated 27 July, 1996; The Ozone Unit was created through Minister's order nr. 27 on April 7, 1999 and is responsible for coordination of process of implementation of the NP Action Plan aimed at a gradual phase-out of ODS in the Republic of Moldova; monitoring the implementation of the NP, conduct and accomplishment of the Refrigeration Management Plan and the Program for the recovery/recycling of refrigerants; monitoring results of gradual phase-out of ODS and development of appropriate reports concerning the gradual phase-out of ODS in Moldova and presenting them to the Government of Moldova, UNEP and other international bodies. (<http://www.ozon.md/?lng=en>). The Montreal protocol refers to 916 substances, Moldova does not produce any of them and activity is focused on import/export of these substances, mainly referring to 3 of them. Being part to this Protocol, Moldova has to eliminate till 2020, all substances falling under annex A and starting with 2013 Moldova will have to eliminate substances specified in annex C.

More information on Moldova reporting state under the convention could be find at: http://ozone.unep.org/new_site/en/Information/

3. **The Convention on the Control of Trans boundary Movements of Hazardous Wastes and Their Disposal** (Basel, 22 March 1989), ratified through Parliament Decision no. 1599-XIII on 10 March 1998; Ministry of Environment is designated as responsible authority for the coordination of convention implementation. Within the Basel Convention, Moldova is reporting annually according to the provisions of the articles 13 and 16. The NFP for Basel Convention is responsible for coordination and implementation of Basel Convention, involving the working group members in the implementation of Action Plans developed by Secretariat of Convention. In this regard, was approved the Regulation on control of trans-boundary movements and disposal of hazardous waste, no. 637 of 28.05.2003, that transposes the Basel Convention provisions on the control of trans-boundary movement and disposal of hazardous waste in order to prevent illegal trans-boundary waste movement.

The most recent report on Basel Convention implementation was sent to the Secretariat of the convention on 16.01.2009. More information on reporting under the Basel Convention can be found at: <http://basel.int/natreporting/index.html>

4. **Convention on Wetlands of International Importance especially as Waterfowl Habitat** (Ramsar, 1971), ratified through Parliament Decision no. 504-XIV dated 14 July 1999; Republic of Moldova started to report under the Ramsar Convention since 2002, in 2005 was sent the second report and in 2008 there was sent the third report. Next COP at which national reports are presented will be in 2015. More information on Moldova status under the Ramsar Convention can be found at: http://www.ramsar.org/cda/en/ramsar-documents-natl-rpts-cop10/main/ramsar/1-31-121-277_4000_0

5. **The Convention on Persistent Organic Pollutants**, (Stockholm, 23 May, 2001), ratified through Law no. 40-XV dated 19 February, 2004. NFP for the POPs Convention is MoE. In order to implement the provisions of POPs Convention, in 2006 Ministry of Ecology and Natural Resources established the POPs Office, main task of which was promoting the National Strategy for Reduction and Elimination of Persistent Organic Pollutants and implementation of the National Implementation Plan for the Stockholm Convention. The Office is also carrying out and coordinating projects in the field of persistent organic pollutants and other hazardous chemicals, and implementing the requirements of relevant international treaties. (<http://www.moldovapops.md/management/>). Republic of Moldova has reported on POPs Convention implementation in 2007 and 2010. More information on results of implementation of Stockholm Convention in Moldova can be found at: <http://chm.pops.int/Countries/National%20Reports/First%20Round%20of%20Party%20Reports/tabid/254/Default.aspx>

3.2. Description of environmental data availability and data flows

3.2.1. Water data information

Information collected from laboratory analyses and from the monitoring network is sent to Centre on Integrated Ecological Monitoring and Informational Management (CIEMIM) of SHS. This Center is responsible for storage, collection, generalization, statistical analyses, and assessment of data on environmental quality. Its task consists of development of a database based on analysis and calculations received from the Environmental Quality Monitoring Department. The database is systematically completed with updated information on the state of air, surface water and soil pollution. This information is used to prepare monthly bulletins on environmental quality, on high and extremely high pollution, and provide informative bulletins and other types of updated information for the beneficiaries.

The national monitoring system is undertaken according to the national and regional requirements. SHS is analyzing 49 hydro chemical indicators such as indicators of oxygen regime, physical indicators, biogenic elements, heavy metals, POPs and 7 groups of hydro-biological elements - bacterioplankton, - phytoplankton (during the last years there was initiated the spectrometric determination of the chlorophyll „a” content, that was a requirement of Water Framework Directive 60/2000 and international standard SM SR ISO 10230:2007), zooplankton, periphyton, phytobenthos, macrophytes and macrozoobenthos. The technological process for water monitoring information development to be distributed to users has four main stages:

- Reception (include daily observations on water level, precipitations, water & temperature, turbidity, ice thickness, discharge),
- Collection (each month information from hydrological posts is sent to hydrological stations, daily until 8.30, the information from the informational posts is sent to the Chişinău-Apă to be operatively processed and to develop the hydrological forecasts),
- Process (process of information starts at the hydrological post and is ending in the Department of Hydrology which is developing the publications – ("The annual data on the regime and state of the surface water resources", "State Water Cadaster", "The guidelines of the multiannual characteristics".),

- Dissemination (making available forecasts of 1) spring high waters and pluvial floods, as well as dangerous hydrological phenomena, 2) forecasts on the river frost and melt thickness of the ice cover, 3) areas of snow cover, its height and the equivalent in water of the snow

Hydrological monitoring data for the period 1993-2009 are stored in a DOS program, being introduced in digital format. Since 2009 data are entered in an Excel format. Below is presented a map of the hydrological network in Moldova.

REȚEAUA NAȚIONALĂ DE MONITORING HIDROLOGIC

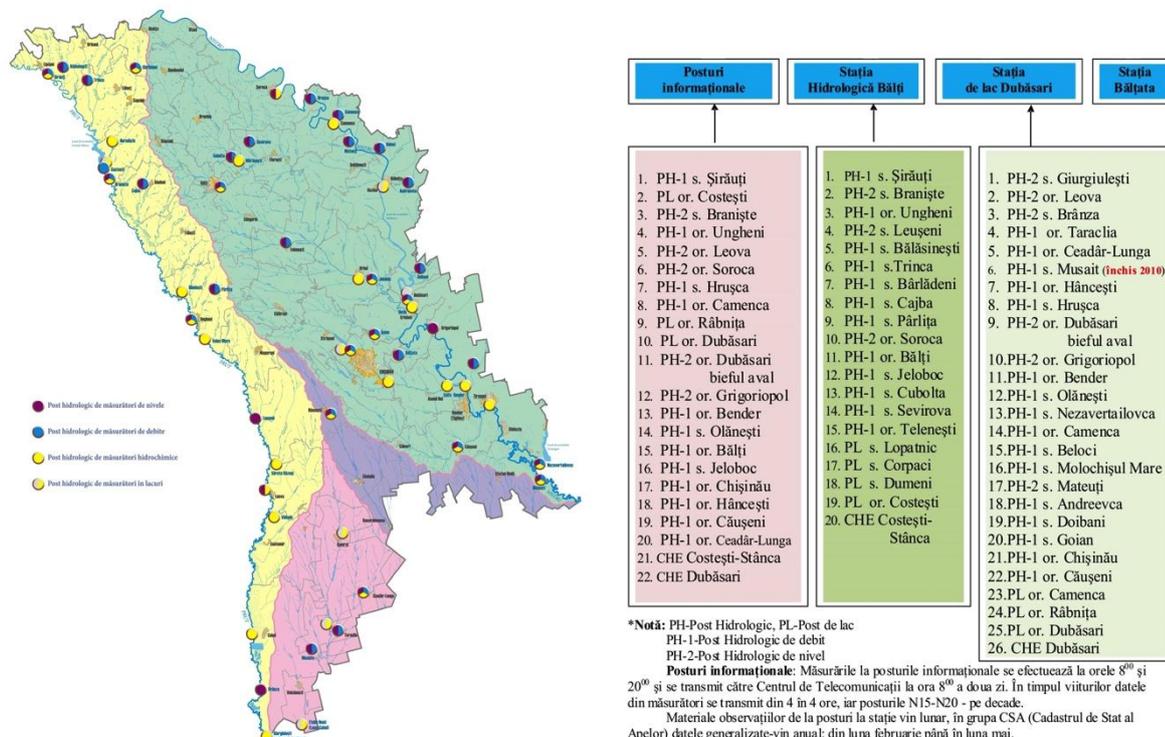


Figure 3.
National hydrological monitoring network
Source: State Hydrometeorological Service

The information about the quality of environmental compounds obtained on the basis of laboratory analysis and from the monitoring network can be found on the webpage www.meteo.md, as well as in the Data Fund of the State Hydro meteorological Service.

Agency "Apele Moldovei" is issuing reports on water management regularly since 1978. The reports on water use contain the following parameters: water abstraction, consumption, water supply for agriculture, water supply for household and drinking needs, and quantity of water in circulation and re-used, conventionally pure water, polluted waters, purified water. The Agency holds a paper database on water use and discharges since 1983. Within the MCA Project "Irrigation Sector reform activity – RBM sub-activity" that is under implementation in Moldova, there was investigated possibility to convert the paper-based information to Windows interface, but the underlying database is still Dbase. Only data from year of 2010 are available in Windows format. This tool stores data only for one year and when introducing new data the old data are deleted. The stored information in Windows is not spatially referenced. Other data used within the Agency are introduced in Excel format. In spite of the tasks that have to be fulfilled according its responsibilities, the Agency has lack of specialists for water quality, hydrology, GIS and IT sectors. One of the conclusions made by the MCA project was

that currently, the Apele Moldovei Agency does not have GIS capacity. In context of the above is evident that Agency needs further assistance in improvement of database development, software, equipment and training of specialists.

According to its tasks, **AGMR** collects hydrometric data, carries out aquifer pumping tests and is doing the groundwater sampling. In order to implement the quality monitoring of the main water supply sources, Agency is using the network of observation boreholes. The water level in the boreholes is measured by agency observers and local residents. On a monthly basis, measurements are sent by post to AGMR main office to be examined. The correctness of measurements is checked during inspection visits that are done usually twice a year. The analysis of groundwater quality can be sub-divided into two main formats:

1. Type 1, routine sampling of major ions and physical characteristics: sodium, potassium, calcium, magnesium, ammonia, sulphite, sulphate, bicarbonate, chloride, nitrate, fluoride, methane, taste, odor, turbidity, color, dry residue, total hardness, carbonate and non-carbonate alkalinity.
2. Type 2, targeted sampling of micro-components when there is known to be a problem: phosphate, manganese, iron, copper, molybdenum, arsenic, lead, selenium, zinc, aluminum and beryllium.

AGMR holds an archive (on paper) on all kinds of geological exploitation activities including hydrogeology, undertaken on the territory of the Republic of Moldova since 1890. AGMR requires to be equipped with computers, software (including numerical modeling packages such as MODFLOW, SURFER), and modern instrumentation including transducers for boreholes and loggers, such as DIVERS. Also the AGMR staff has to benefit of periodical training in order to be able to work at appropriate level.

National Center for Public Health (NCPH) is responsible for monitoring of the quality of drinking water. The observations made on this issue are reflected in a biennial Report "Health in relation to environment", second edition being published in 2010. This report is reflecting data and situation on monitoring, evidence and periodic analysis of population health in relation to environmental components. It is published in Romanian language and is available in electronic format at the website of the Center (<http://www.cnspl.md/info.php?id1=37&id2=26>).

Actually we do not have an information system for state supervision of public health which could offer information to all interested stakeholders on human health and environment. Also there is need for integration of the Ministry of Health and State Ecological Inspection laboratories into a unified laboratory system. Currently the laboratories of NCPH are able to analyze limited organic micro pollutants, being equipped with photo colorimeter, thermostat, ionometer, atomic absorption spectrometer, gas and liquid chromatograph. The national data on quality of drinking water are available only in annual collection of National Center for Public Health that are available at – www.cnspl.md .

3.2.2. Air data information

Since the very beginning, SHS has maintained a data base on paper for the period of 1970-1992, for the period 1992-2005 data is transferred to a MSDOs file and for the 2005 - present; data is in an Excel spreadsheet. SHS stores, analyses and interprets the data on atmospheric air pollution received from the analytical laboratories and the data on the radioactive background collected from all stations. This information is published in warning bulletins on exceptional pollution, as well as bulletins on current quality of air covering the national territory. Also, the gathered information on air quality is presented on maps that are produced for 5 cities. This information is available in Romanian language and is posted on the SHS website (www.meteo.md) .

Below is shown a map of air pollution for Chisinau city. Similar maps are developed for other cities including Balti, Tiraspol, Bender and Ribnita.

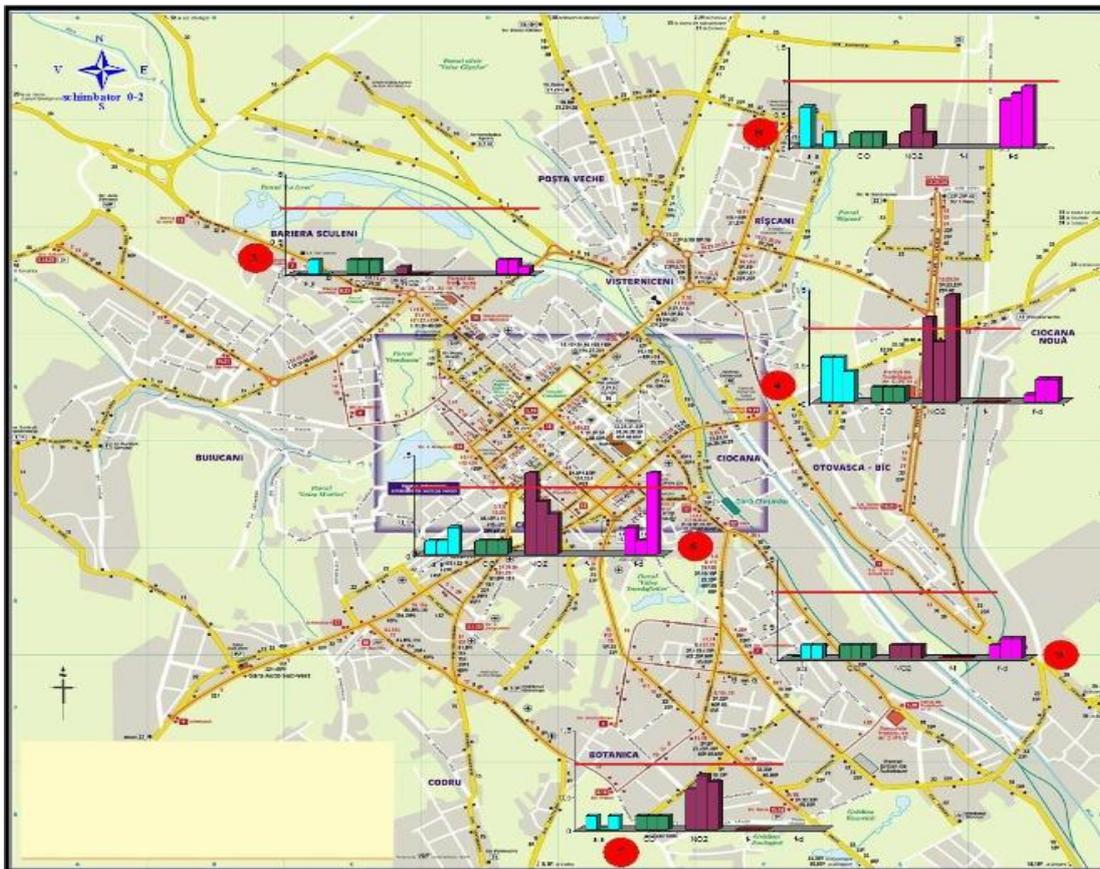


Figure 5.
Map of Air Pollution in Chisinau, 11/14/11(1300,1900) and 15/11/11 (700) (Maximum instant concentration, expressed in MAC*)
Source: State Hydrometeorological Service

Legend:

	Solid suspensions
	carbon monoxide
	nitrogen dioxide
	Phenol
	Formaldehyde
	CMA*
	POP
	wind direction
*CMA	Maximum allowed concentration

The information on air quality for the development of the following reports: “Environmental protection in the Republic of Moldova” Yearbook, “State of the environment of the Republic of Moldova” (2007-2010), is also used for publishing warning bulletins on exceptional pollution and current bulletins on air quality. This information is accessible in Romanian language on the website of the MoE (<http://www.meniu.gov.md/>) and SHS (www.meteo.md).

3.2.3. Waste data information

As mentioned in Chapter on infrastructure, section 2.3 above, no waste monitoring network is established yet in Moldova. In this context, we can refer only to data reported by economical entities according to the legal requirements in this sector. The procedure on waste reporting was described in above chapter. In final stage data is reported to NBS, which is processing and publishing them in the Annual Statistical Yearbook. These data are also available in electronic format on the website of the NBS (<http://statbank.statistica.md/pxweb/Dialog/Saveshow.asp>).

For the waste reporting procedure, 3 statistical forms are used: F 1 – “Generation and use of waste in enterprises and organizations”, F 2 – “Toxic waste” and F 3 – “Domestic waste in urban area”.

Table 7 was prepared in order to give an entire picture on primary data reported by economic entities and other organizations that work in the field of waste management.

Table 7.
Waste data reporting

Type of reporting form	Required reporting information
F1“Generation and use of waste in enterprises and organizations”	existing at the beginning of the year, / <i>thousand tonnes</i> generated, inputs, used, supplied, destroyed or transported to dumps, existing at the end of the year.
F 2 – “Toxic waste”	transported during one year, / <i>thousand m³</i> area of neutralization of domestic solid waste (ha), number of discharge tanks.
F 3 – “Domestic waste in urban area”	number of surveyed enterprises units, / <i>thousand tones</i> generated waste, neutralized waste, transported to domestic waste areas, existing waste at the end of year.

The reported information on waste, as mentioned above, is used for reporting under the Basel, Stockholm and Climate Change Conventions.

IV ANALYSIS OF STRENGTHS AND WEAKNESSES

After analyzing and describing, strengths and weaknesses of current cooperation, infrastructure and information on the environment with focus on 3 pointing areas - water, air, waste - we came to the conclusion that there are opportunities for SEIS development in the Republic of Moldova as follows:

1. First of all we should mention ***the clear EU integration path*** that is promoted in Moldova. The cooperation Moldova-EU is now in an advanced stage, resulting in negotiation of an Association Agreement between Republic of Moldova and EU where the environmental sector features as an important part.
2. The ***legal process for approximation*** of the EU Directives into national legislation is also well underway. Here we can mention the development of the draft Environmental Strategy (2012-2020), draft Law on Environmental Protection, draft Strategy on Waste Management (2012-2020), draft Law on waste, draft Law on Water, draft Law on Chemical substances, draft Law on Environmental Impact Assessment, that have the provisions on integrated monitoring of environmental components and EU legal provisions transposed etc.
3. ***Development and promotion of E-Governance approach.***
4. ***Provisions for Establishment of the Environmental Protection Agency.***
5. ***Good technical base within the SHS***, with trained specialists that could serve as base for the future SEIS center.
6. ***Improved administrative and statistical system*** for data collection in context of reporting on environmental pollution, improved cooperation between the MoE and NBS.
7. ***Existence of many databases in different sectors*** (POPs, SEI, climate change, ozone, water, air) that have to be synchronized and concentrated in the future SEIS Center.
8. ***Existence of international projects in the field*** of water, air and waste that could be partners or contribute to SEIS development, that could cover training needs, database development, supply with equipment, improvement of legal framework.

Beside the mentioned strengths, there are also some **constraints** for implementation of SEIS in Moldova including:

1. ***Imperfect legal framework.*** For example, existing legal framework (the 1997 Law on Atmospheric Air Protection) is regulating air pollution from mobile sources, but established limit values for pollution are those applied for old soviet vehicles and numbers of regulated components is limited as CO₂, hydrocarbons for the gas vehicles and fumigate level of diesel cars. Nevertheless, the Republic of Moldova has adopted in 1998 the Regulation on Integrated environmental monitoring system, which foresees data and information exchange on environmental components. Regulation was covering a large range of important social, economic, waste, water, soil, air, mineral resource, biodiversity, indicators, but in spite of undertaken efforts there is less progress on implementation of this Regulation.
2. ***Lack of inter-sectoral cooperation.*** Problems in collaboration between institutions under MoE subordination as well as with other governmental structures (MH), especially for data exchange.
3. ***Use of Soviet Union Standards*** for monitoring of environmental components. In Moldova are used only 28% of ISO standards, in rest the old Soviet standards are used.
4. ***Reduced list of parameters monitored*** in priority areas (water, air, waste). For example the monitoring and reporting systems on air quality that require enlargement of list of atmospheric pollutants like: PM₁₀, NH₃, COV, Pb, O₃, etc., Also, the evidence on management of solid household waste through the final disposal at the SHW landfills is only partially covered.
5. Use of ***different approaches for data sampling.***
6. There is ***no inter-calibration between laboratories.***
7. ***Few databases are on electronic format***, databases on the paper are still used.

8. **Introduction of integrated environmental authorization/permits.** The actual authorization system for air pollution is trying to regulate too many substances, but the rules for authorization are the same for the small or big enterprises regardless of the level of their impact on environment.
9. **List of environmental indicators is not officially adopted.**
10. **Lack of indicators and methodologies compatible with international standards**
11. **Fragmented environmental information system.** There are several institutions involved in the information process (MoE, SEI, SHS, NBS, etc), which offer fragmented data for separate sectors.
12. **Lack of sufficient equipment, trained specialists** for conducting the monitoring of environmental components.

V PROPOSED ACTIONS AND IMPLEMENTATION PLAN

In order to introduce efficient management of integrated environmental monitoring and a shared environmental information system in Moldova, assistance is required for the following issues:

- **Development and improvement of methodologies** for setting-up of statistical and environmental indicators, their processing, data collection, sharing of data, data bases development.
- **Approximation of national legal framework to EU requirements** for the priority sectors.
- **Establishment of emission limit values at national level for the air sector, development of atmospheric emissions inventory** for air pollutants and greenhouse gases.
- **Capacity building support (training)** for specialists in water and water related ecosystems, air and waste sector, especially for development of statistical and environmental indicators, processing of information, data collection, use of modern softs as GIS, ARC VIEW, development of databases, introduction of integrated environmental authorization/permits, development and implementation of the integrated RBM approach, development of State of Environment reports in accordance with UN ECE indicators list.
- **Assistance for accessing and using new software** for data, collection, processing, accession and reporting.
- **Support for using and integration of** E-Governance Centre in development of SEIS in Moldova.
- **Making compatible the environmental standards for SEIS development.**
- **Development of new reporting forms** for waste, water and air sectors, with support of Norway Statistical Office.
- **Identification of gaps and needs in information exchange** process between different organizations at national and international level.
- **Assist Moldova in becoming member of the EEA.** There is also needed methodological and procedural support for EPA establishment.

Based on the conducted discussions during the ENPI-SEIS country visit in September 6-7 this year, here are proposed several projects/activities for future collaboration within the ENPI-SEIS project.

1. **Establishing an Integrated Environmental Information Center.** Support and guidance is required for developing and participation in a TWINING Program for establishing the Integrated Environmental Information Center that will host all the information (databases) gathered by all structures involved in the monitoring and information system. According to the draft Environmental Protection Law provisions, this Center will include the existing registers, cadasters, data bases for all environmental components, also it will contain data and information on state of the environment, pollution levels, environmental impact of pollution and will facilitate access to environmental information for all stakeholders including public and civil society. This assistance will represent a significant support for Moldova in creating SEIS.

2. Another proposal consists of possibility to get **assistance within a TAIEX/TWINNING Programme for development and implementation of the River Basin Management Plans (RBMP)**. Currently in Moldova the new Law on water was adopted transposing the EU Directives in this field including the Water Framework Directive (WFD). Thus, Moldova will be obliged to start implementing the river basin management approach in water sector. In this context it will be helpful to get acquainted with European experience on developing, implementing RBM plans with inclusion of specific data and maps on water quality, water biodiversity etc.

3. **Participation in Air Watch Program**, which deals with public access to monitoring in the near real time of air quality. Starting with 2007 SHS is undertaking monitoring in real time of air parameters. Thus, in an automatic way are monitored about 15 parameters, out of which 10 are atmospheric pollutants and 5 are meteorological parameters. This activity will represent a new opportunity for Moldova to develop its air monitoring system, will facilitate development of new collaboration possibilities and will contribute to better fulfillment of Moldova's obligations under MEAs. Development of a new legal document on **Integrated Environmental Monitoring System in the Republic of Moldova**, with support of the ENPI-SEIS Project. Despite attempts to implement the

existing Regulation, this initiative was not supported by governmental organizations and now it is not functioning. As result, we can say that there are no procedures on environmental data sharing and exchange of information for the moment.