UNITED NATIONS ECONOMIC COMMISSION FOR EUROPE

Republic of Moldova
Environmental Performance Reviews
Third Review





UNITED NATIONS

ECE/CEP/171

UNITED NATIONS ECONOMIC COMMISSION FOR EUROPE

ENVIRONMENTAL PERFORMANCE REVIEWS

REPUBLIC OF MOLDOVA

Third Review

UNITED NATIONS
New York and Geneva, 2014

Environmental Performance Reviews Series No. 39

NOTE

Symbols of United Nations documents are composed of capital letters combined with figures. Mention of such a symbol indicates a reference to a United Nations document.

The designations employed and the presentation of the material in this publication do not imply the expression of any opinion whatsoever on the part of the Secretariat of the United Nations concerning the legal status of any country, territory, city or area, or of its authorities, or concerning the delimitation of its frontiers or boundaries. In particular, the boundaries shown on the maps do not imply official endorsement or acceptance by the United Nations.

The United Nations issued the second Environmental Performance Review of the Republic of Moldova (Environmental Performance Reviews Series No. 23) in 2005.

This volume is issued in English and Russian.

ECE/CEP/171

UNITED NATIONS PUBLICATION
Sales E.14.II.E.6
ISBN 978-92-1-117075-7
e-ISBN 978-92-1-056518-9

ISSN 1020-4563

Foreword

In 1993, Environmental Performance Reviews (EPRs) of the United Nations Economic Commission for Europe (ECE) were initiated at the second Environment for Europe Ministerial Conference, in Lucerne, Switzerland. They were intended to cover the ECE member States that are not members of the Organisation for Economic Co-operation and Development (OECD). Subsequently, the ECE Committee on Environmental Policy decided to make them part of its regular programme. Since then, the Ministers affirmed their support for the EPR Programme, and decided in 2003 that the Programme should continue with a second cycle of reviews, and lately they formally endorsed the third cycle of reviews in 2011.

In response to new global and regional concerns, it was decided that integrating green economy into the third cycle of the EPR Programme promises to add value to its work, first, due to its relevance and importance for the countries under review and, second, due to the potential to enhance international cooperation with the community of donors and investors.

Through the peer review process, EPRs also promote dialogue among ECE member States and the harmonization of environmental conditions and policies throughout the region. As a voluntary exercise, an EPR is undertaken only at the request of the country concerned.

The studies are carried out by international teams of experts from the region working closely with national experts from the reviewed country. The teams also benefit from close cooperation with other organizations in the United Nations system, for instance the United Nations Development Programme (UNDP), the United Nations Environment Programme (UNEP) and the World Health Organization (WHO) as well as with the European Environment Agency (EEA) and other organizations.

This is the third EPR of the Republic of Moldova published by ECE. The review takes stock of progress made by the country in the management of its environment since the country was reviewed the second time in 2005. It assesses the implementation of the recommendations in the second review (annex I). This third EPR also covers ten issues of specific importance to the country related to policymaking, planning and implementation, the financing of environmental policies and projects, climate change mitigation and adaptation, and the integration of environmental concerns into economic sectors, in particular agriculture.

I hope that this third EPR will be useful in supporting policymakers and representatives of civil society in their efforts to improve environmental management and to further promote sustainable development in the Republic of Moldova, and that the lessons learned from the peer review process will also benefit other countries of the ECE region.

Michael Møller
Acting Executive Secretary
Economic Commission for Europe

Preface

The Republic of Moldova is the first country that has been reviewed under the third cycle of EPRs. The third Environmental Performance Review (EPR) of the Republic of Moldova began in May 2012 with a preparatory mission. During this mission, the structure of the review report was agreed upon and the time schedule established. A review mission took place on 5-13 February 2013. The team of international experts taking part included experts from Estonia, Georgia, Germany and Slovakia, as well as from the EEA and ECE.

The draft EPR report was submitted to the Republic of Moldova for comment and to the ECE Expert Group on Environmental Performance Reviews for consideration in August 2013. During its meeting on 1-2 October 2013, the Expert Group discussed the report in detail with expert representatives of the Government of the Republic of Moldova, focusing in particular on the conclusions and recommendations made by the international experts.

The EPR recommendations, with suggested amendments from the Expert Group, were then submitted for peer review to the nineteenth session of the ECE Committee on Environmental Policy on 24 October 2013. A high-level delegation from the Republic of Moldova participated in the peer review. The Committee adopted the recommendations as set out in this report.

The Committee on Environmental Policy and the ECE review team would like to thank the Government of the Republic of Moldova and its experts who worked with the international experts and contributed their knowledge and assistance. ECE wishes the Government of the Republic of Moldova further success in carrying out the tasks involved in meeting its environmental objectives, including the implementation of the recommendations in this third review.

ECE would also like to express its appreciation to the German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety, and to the German Federal Environment Agency for their support to the EPR Programme through the Advisory Assistance Programme for Environmental Protection in the Countries of Central and Eastern Europe, the Caucasus and Central Asia; to Germany and the EEA for having delegated their experts for the review; and to the UNDP for its support of the EPR Programme and this review.

Team of experts for the second EPR of the Republic of Moldova, 2013

LIST OF TEAM MEMBERS

Mr. Antoine Nunes	ECE	Team Leader
Mr. Yaroslav Bulych	ECE	Project coordinator
Ms. Oksana Rott	ECE	Logistics coordinator
Mr. Jyrki Hirvonen	ECE	Introduction
Mr. Merab Sharabidze	ECE consultant	Chapter 1
Mr. Aare Sirendi	ECE consultant	Chapter 2
Mr. Dieter Hesse	ECE consultant	Chapter 3
Ms. Adriana Gheorghe	EEA	Chapter 4
Ms. Virgina Fuse	ECE	Chapter 5
Mr. George Georgiadis	ECE	Chapter 6
Ms. Sabrina Stahl	Germany	Chapter 7
Mr. Juraj Farkaš	ECE consultant	Chapter 8
Mr. Sebastian Schmidt	ECE consultant	Chapter 9
Mr. Yaroslav Bulych	ECE	Chapter 10

Mr. Mikhail Kokine, Chief of the Operational Activities and Review Section of the ECE Environment Division, undertook a full substantive review of this publication.

Information cut-off date: 30 November 2013

ECE Information Unit
Palais des Nations
CH-1211 Geneva 10
Switzerland

Tel.: +41 (0)22 917 44 44
Fax: +41 (0)22 917 05 05
E-mail: info.ece@unece.org
Website: http://www.unece.org

LIST OF CONTRIBUTORS

National contributors

Ministry of Environment

Mr. Gheorghe Șalaru
Ms. Valentina Țapiș
Mr. Lazăr Chirică
Ms. Maria Nagornîi
Ms. Svetlana Bolocan
Ms. Elena Breahnă
Ms. Nadejda Chilaru
Mr. Veaceslav Ciornîi
Ms. Elena Creangă
Ms. Lilia Eladii
Mr. Gavril Gîlcă
Mr. Vitalie Grimalschi
Ms. Veronica Josu
Ms. Veronica Lopotenco
Ms. Raisa Leon
Ms. Maria Malic
Ms. Ludmila Marduhaeva
Mr. Corneliu Mîrza
Ms. Galina Norocea
Ms. Irina Panamariova
Mr. Adrian Panciuc
Ms. Anatolie Pîrlii
Ms. Elina Pleşca
Mr. Valentin Pleșca
Ms. Tatiana Pleșco
Ms. Ana Sîrbu
Ms. Viorica Staver
Ms. Svetlana Știrbu
Ms. Ala Rotaru
Ms. Serafima Tronza

Ministry of Economy

Mr.Vadim Ceban
Mr. Călin Negură

Ministry of Finance

Mr. Viorel Pană
Ms. Lilia Taban

Ministry of Labour, Social Protection and Family

Mr. Oleg Barcari

Ministry of Regional Development and Constructions

Mr. Valerian Bînzaru

Ministry of Transport and Roads Infrastructure

Ms. Elena Cacicovschii
Mr. Andrei Cuculescu
Mr Adam Begu
Mr. Andrei Slănină
Mr. Ion Sula
Ms Maria Nedealcov

Ministry of Agriculture and Food Industry	
	Ms. Tamara Rozmerița
	Mr. Ion Sula
	Mr. Mihai Butucel
Ministry of Education	
	Ms. Galina Gavriliță
Ministry of Health	
	Mr. Dumitru Sirețeanu
Agency of Geology and Mineral Resources	
	Mr. Dumitru Coadă
	Mr. Boris Iurciuc
Agency “Apele Moldovei”	
	Mr. Valeriu Cojocaru
	Mr. Gîscă Constantin
	Mr. Alexandru Coronovschi
	Mr. Dimitru Proca
	Mr. Ion Șavga
	Mr. Lazăr Sergiu
Institute of Pedology, Agrochemistry and Soil Protection “Nicolae Dimo”	
	Ms. Olga Arhip
	Mr. Aurel Burghelea
	Mr. Valerian Cerbari
	Mr. Vladimir Filipciuc
	Ms. Ecaterina Cuharuc
	Ms. Tamara Leah
	Ms. Marina Lungu
	Mr. Vasile Lungu
	Mr. Vasile Plămădeală
	Mr. Iurii Rozloga
	Mr. Alexandru Rusu
	Ms. Galina Mămăligă
	Ms. Irina Sincovschi
	Mr. Andrei Siuris
Institute of Ecology and Geography	
	Mr. Iurie Bejan
	Mr. Tudor Castraveț
	Mr. Petru Cocîrță
State Chancellery	
	Ms. Oxana Gluscenco
	Mr. Ion Gumenie
State Ecological Inspectorate	
	Mr. Victor Dumneanu
	Mr. Dumitru Osipov
	Mr. Vadim Stîngaci
	Ms. Alina Surdu

State Hydrometeorological Service	
	Ms. Violeta Balan Mr. Gabriel Gîlcă Ms. Elina Pleșca Ms. Svetlana Știrbu Ms. Liudmila Treșcilo
Environment Pollution Prevention Office	
	Ms. Tatiana Țugui
Ozone Office	
	Mr. Anatol Tarîță
Climate Change Office	
	Mr. Ion Comendant Mr. Vasile Scorpan Mr. Marius Țaranu Ms. Lilia Țaranu
Chisinau Ecological Agency	
	Mr. Nelian Căpățînă
National Bureau of Statistics	
	Ms. Elena Orlova Ms. Ludmila Lungu
National Energy Regulatory Agency (ANRE)	
	Mr. Gheorge Lupan Mr. Alexandru Mija
National Agency for Regulation of Nuclear and Radiological Activities	
	Mr. Ionel Balan
Forestry Research and Management Institute	
	Mr. Dumitru Galupa
Centre for Strategic Environmental Studies	
	Ms. Tatiana Belous
State Tourism Agency	
	Mr. Sergiu Iordan
Agency “Moldsilva”	
	Mr. Tudor Botnari
Association of water supply and sewerage companies “Moldova Apa-Canal”	
	Mr. Iurie Nistor
Chisinau municipal waste enterprise “I. M. Regia Autosalubritate”	
	Mr. Tudor Manev

Municipal Administration of Chisinau
Mr. Ion Bălțeanu
Mr. Oleg Ponomarenco

Sanitary Veterinary and Animal Origin Food Safety Agency
Mr. Vitalie Carauș

SC “Centre of Quarantine, Identification, Arbitrage Expertise and Disinfection of Products”
Mr. Nicanor Cernautan

C.I. “Fructagroprom”
Mr. Iurie Bivol

National College of Viticulture and Winemaking in Chisinau
Mr. Ion Ciorna
Mr. Alexandru Covrig

General Inspectorate for Phytosanitary Surveillance and Seeds Control
Mr. Jacob Arama

Republican Centre of Applied Pedology
Mr. Gheorghe Jigău

State poultry farm “Anenii Noi”
Mr. Semion Oprea

International community

United Nations Convention to Combat Desertification in Countries Experiencing Serious Drought and/or Desertification, Particularly in Africa (UNCCD)
Ms. Jamal Annagylyjova

United Nations Development Programme (UNDP)
Ms. Ecaterina Melnicenco
Ms. Silvia Pana-Carp
Ms. Ina Prisacaru
Mr. Alexandru Rotaru
Mr. Ruslan Surugiu
Ms. Nadia Vetter

World Bank
Mr. Arcadii Capcelea

Delegation of the European Union to the Republic of Moldova
Mr. Oleg Hîrbu

European Environment Agency (EEA)
Ms. Carmen Mădălina Cozma
Mr. Valentin Foltescu

ENPI FLEG Programme
Mr. Aurel Lozan

REC Moldova	Mr. Victor Cotruță
Swedish Embassy	Mr. Patrick Stalgren

Non-governmental and other organizations

"Biotica" Ecological Society	Mr. Alexei Andreev
Ecological Movement of Moldova	Mr. Alecu Reniță Ms. Lilia Curchi
"Eco-TIRAS"	Mr. Ilya Trombitsky
Silva'Mileniu III	Mr. Andrei Cerescu

Other

Independent experts	Ms. Jana Tafi Ms. Ljubov Gornaja Ms. Gabriela Vasiliu-Isac
ABS Company	Ms. Inga Balica
Ircon, Czech Republic	Mr. Libor Novák

Page

CONTENTS

Page

PART II DOMESTIC-INTERNATIONAL INTERFACE

Chapter 5: Implementation of international environmental agreements and commitments

Chapter 6: Climate change adaptation and mitigation

PART III: ENVIRONMENTAL MAINSTREAMING IN PRIORITY SECTORS AND PROMOTION OF SUSTAINABLE DEVELOPMENT

Chapter 7: Sustainable water management

Chapter 8: Waste management

Chapter 9: Biodiversity and protected areas

Chapter 10: Agriculture and environment

Page

ANNEXES

LIST OF TABLES

Page

LIST OF FIGURES

LIST OF MAPS

LIST OF BOXES

LIST OF PHOTOS

PHOTO CREDITS

Photo I.1: Eco-TIRAS
Photo 1.1: Mr. Yaroslav Bulych
Photo 2.1: Mr. Yaroslav Bulych
Photo 3.1: Ms. Angela Sochirca
Photo 4.1: Ms. Angela Sochirca
Photo 5.1: Mr. Yaroslav Bulych
Photo 6.1: Eco-TIRAS
Photo 7.1: Eco-TIRAS
Photo 8.1: Eco-TIRAS
Photo 9.1: Eco-TIRAS
Photo 10.1: Mr. Yaroslav Bulych
Cover page photos: Dniester River (Eco-TIRAS), handcraft (Lilia Taranu), stork family (Angela Sochirca), house in Butuceni village (Eco-TIRAS), peony (Angela Sochirca)

KEY ABBREVIATIONS

ANRE	National Energy Regulatory Agency
CDM	Clean Development Mechanism
EBRD	European Bank for Reconstruction and Development
EIA	environmental impact assessment
ENPI	European Neighbourhood Partnership Instrument
EPR	Environmental Performance Review
ESD	education for sustainable development
EU	European Union
GD	Government Decision
GHG	greenhouse gas(es)
GMO	genetically modified organism
MDGs	Millennium Development Goals
MEA	multilateral environmental agreement
MO	Ministerial Order
MTEF	medium-term expenditure framework
NAER	National Agency for Energy Regulation
NBS	National Bureau of Statistics
NDS	National Development Strategy
NEEP	National Energy Efficiency Programme
NEF	National Environmental Fund
NGO	non-governmental organization
ODS	ozone-depleting substances
OECD	Organisation for Economic Co-operation and Development
PA	protected area
POP	persistent organic pollutant
PPP	public–private partnership
SEI	State Ecological Inspectorate
SHS	State Hydrometeorological Service
SIDA	Swedish International Development Cooperation Agency
UNDP	United Nations Development Programme
UNFCCC	United Nations Framework Convention on Climate Change

SIGNS AND MEASURES

..	not available
-	nil or negligible
.	decimal point
$	dollar
cap	capita
Ci	Curie
d	day
GWh	gigawatt-hour
ha	hectare
kg	kilogram
kJ	kilojoule
km	kilometre
km^2	square kilometre
km^3	cubic kilometre
kgoe	kilogram of oil equivalent
ktoe	kiloton of oil equivalent
kV	kilovolt
kW	kilowatt
kWh	kilowatt-hour
l	litre
m	metre
m^2	square metre
m^3	cubic metre
MW	megawatt
ppm	parts per million
s	second
t	ton
toe	ton of oil equivalent
tofe	ton of fuel equivalent
TWh	terawatt-hour

CURRENCY CONVERSION TABLE

Year	Lei per Euro	Lei per US$
2005	15.69	12.60
2006	16.49	13.13
2007	16.61	12.14
2008	15.29	10.39
2009	15.49	11.11
2010	16.40	12.37
2011	16.33	11.74
2012	15.57	12.11
October 2013	17.78	13.04

Source: ECE common database (accessed 20 November 2013).

Executive summary

The second Environmental Performance Review (EPR) of the Republic of Moldova was carried out in 2005. This third review intends to measure the progress made by the Republic of Moldova in managing its environment since the second EPR and in addressing upcoming environmental challenges.

Gross Domestic Product (GDP) per capita in national currency terms more than doubled between 2005 and 2012 and GDP per capita in 2005 Purchasing Power Parity (PPP) US$ terms grew an impressive 26.4 per cent from 2005 to 2011. Despite this growth the Republic of Moldova's GDP per capita remains the lowest in Europe.

The massive inflow of workers' remittances has played a very important role in the country's economic development. About 22 per cent of the Moldovan population resides outside the country – compared with a 3.1 per cent global average. In 2012, workers' remittances made up 22.8 per cent of GDP.

The total volume of air pollutants emitted from stationary sources decreased 24 per cent between 2005 and 2010. However, this positive development is not attributable to industry becoming cleaner than before but, rather, to the reduction in total volume of industrial production.

The total emissions of SO_2 more than doubled between 2005 and 2011 from 2,400 tons to 5,800 tons annually. Practically the whole SO_2 emissions increase was due to the increased emissions from transport.

Drinking water quality is deteriorating, despite the fact that total wastewater discharges decreased by 7.3 per cent from 2005 to 2011. The percentage of samples not meeting sanitary standards grew from 52 per cent in 2005 to 72 per cent in 2011 in the case of water taken from the centralized sources of water supply. The sanitary situation of the decentralized water sources has stayed at the disappointing level of 83 per cent of the samples failing to meet standards.

The amount of municipal waste in 2012 was about 1.9 times higher than in 2005. Generated industrial waste, on the other hand, was, in 2012, only 70 per cent of the 2005 level, mainly due to the contraction of manufacturing industry. The annual amount of recycled industrial waste fluctuates a lot. The recycling rate was 30 per cent in 2005 and 22 per cent in 2011. The end-of-year waste stock stored at the source increased from about 4.3 million tons in 2005 to 7 million tons in 2010.

The hazardous waste generated in 2012 was only 50 per cent of that generated in 2005. Hazardous waste accumulated in on-site storage facilities also diminished from 0.89 million tons in 2005 to 0.6 million tons in 2011.

The amount of timber harvested officially between 2006 and 2010 remained more or less stable, ranging between 410,000 and 440,000 m^3/year, with about 90 per cent being fuel wood. Officially, all sites affected with logging were fully covered with regeneration works. At the same time, the estimated volume of wood consumed in the Republic of Moldova amounts to some 1.04 million m^3 annually, with about 75 per cent being fuel wood.

The consumption of fuel wood is very high, due to a lack of alternative fuel supply, and almost matches the annual growth in the forest. Due to this high turnover, the forest in fact has no chance to age and thus the capabilities for increased biodiversity value are weakened.

Policymaking framework for environmental protection and sustainable development

The environmental legislation did not change substantively in the period under review as only a few environment-related laws were adopted. However, 25 environmental legislative acts and 35 by-laws are expected to be approved by the end of 2014 according to the 2012 Action Plan for the harmonization of the legislation with European Union (EU) directives. This process is expected to trigger a substantial reform of the entire environmental legal framework towards a more integrated approach to environmental protection.

Currently, there is no environmental strategy in the country. To close this gap a national environmental strategy for 2013–2022 was drafted and it is expected to be adopted. In addition, the Ministry of Environment is developing strategies for integrated waste management, biodiversity, water resources management and preventing natural disasters. They are expected to be submitted for adoption by the end of 2013.

Despite the institutional developments, sustainable development has not yet emerged as a core principle of policy development in the country. Promoting sustainable development is a difficult task for the Ministry of Environment considering that the country's environmental requirements are frequently seen as a liability rather than an asset for improving social well-being.

The term "strategic environmental impact assessment" does not exist in the national legislation. The Republic of Moldova signed but has not ratified the Protocol on Strategic Environmental Assessment (Kiev, 2003) to the Espoo Convention on Environmental Impact Assessment in a Transboundary Context.

Regulatory and information instruments and their enforcement

In the field of compliance and enforcement of environmental standards and requirements, moderate progress has been made by the country since 2005. On water and air, environmental quality standards from Soviet times are still used. A huge number of standards are not in line with current international requirements. Numerous regulated pollutant substance regulations are mostly unenforceable, as they are far beyond realistic monitoring capacities.

Environmental permits are still based on single-medium approaches and do not consider the overall environmental impact of economic activities. As a result, an operator of an economic activity may need to obtain a range of environmental authorizations, sometimes from a series of public authorities. The same permitting system is used for all enterprises regardless of their size and pollution potential. The issuing of permits for pollution of the environment and use of natural resources is performed by different institutions.

The current national environmental legislation on industrial emissions lacks a systematic approach and is being focused on regulating the protection of the environment in all sectors separately. An integrated approach to environmental compliance is still under development.

Economic instruments and financing of environmental protection expenditure

The system of environmentally related taxes and charges has not changed since 2005. These payments generate revenues for the environmental funds, but there is no supporting evidence that they provide significant incentives, if any, for pollution abatement. The system of taxes for emissions of air pollutants from stationary sources and for discharges of water pollutants is administratively complex due to the very large number of pollutants that are covered. This significantly weakens the effectiveness of the system.

Separate charges for import of plastic packaging and for tetra-pak packaging that contains products (except dairy products) were introduced in 2007. The tax base (customs value) for the product charges on imports of goods is also neither pollution oriented nor related to the costs of damage prevention. These product charges are, moreover, not applied to similar domestically produced goods.

Market-based instruments (such as trading of emission permits) are not applied. A scheme for the promotion of renewable energy sources is under development. There is no legal framework yet for public sector green procurement or for eco-labelling.

The installation of individual water meters has increased significantly and reached 96 per cent of all connected water users. The average bill collection rate is 82 per cent, pointing to problems of enforcing payment of water bills. There appear, however, to be serious problems – notably in Chisinau – with the quality of meters installed in the past, which are seen to lead to a systematic under recording of cold and hot water consumption, which, in turn, entails significant losses for the Chisinau water company and the local district heating company.

Environmental monitoring, information and education

An integrated environmental monitoring system is not yet established in the country. Currently, the monitoring landscape remains fragmented with many institutions involved in the process and limited information sharing between them. However, comparatively with 2005, significant progress was registered in some areas such as water monitoring, especially for surface waters. Some improvements were registered in other areas such as forests and protected areas, soil and radioactivity. Mixed progress is registered in air monitoring, with limited monitoring capacity of urban air quality. Biodiversity is also lacking systematic monitoring, with fragmented or non-systematic activities carried out by various organizations.

The country lacks a national environmental information system as such. Government bodies have their own databases of relevance for their domain and in practice limited sharing or exchange takes place between them.

Coordination at the institutional level (both national and local) remains poor with non-systematic information exchange between them. Currently, none of the institutions involved in or responsible for environmental information exchange is using a networked relational database for storing and exchanging data. Good progress is observed in terms of public access to statistical data, including environment-related data. Statistical data are available free of charge on the website of the National Bureau of Statistics (NBS). Furthermore, since 2010, a publication containing environment-related statistics for the country, "Natural resources and the environment", has been prepared annually by the NBS and is available online.

Environmental education is present in the school curricula throughout the whole education process. Nevertheless, responsibilities for the area and the institutional competences are often unclear, not systematic and underfunded. Environmental education and education for sustainable development remain heavily dependent on donor support.

Implementation of multilateral environmental agreements and management of foreign assistance

The highest political priority is currently the partial approximation to the EU, the signing and then the implementation of the EU–Republic of Moldova Association Agreement. The negotiations started in January 2010 and are expected to conclude by the end of 2013. Implementation of multilateral environmental agreements (MEAs) has benefited from the preparation of legislation to harmonize the country's legislative situation to the requirements of different EU environmental directives.

In 2005, the Republic of Moldova reconfirmed its commitment towards the implementation of the Millennium Development Goals (MDGs). However, in 2006, the country had already revised all the targets set under MDG7, with the exception of afforestation. The main reason for this was the slow progress in reaching the targets set.

The country generally complies with reporting on the implementation of MEAs, with the exception of the Protocols on Persistent Organic Pollutants (POPs) and on Heavy Metals to the Convention on Long-range Transboundary Air Pollution.

Climate change mitigation and adaptation

The country lacks a national strategic framework on climate change mitigation and adaptation, although sectoral strategies of climate change relevance have been developed in some cases. The development of a national climate change adaptation strategy and a low emissions development strategy started in 2010 with the aim of addressing this major gap in the country's policy framework. However, the development of these two strategies was still ongoing in 2013.

The National Energy Efficiency Programme for 2011–2020 is currently the main document dealing with energy efficiency. NEEP is supported in its implementation by three-year national action plans for energy efficiency. Although the legal framework for renewable energy has been created, a major obstacle to implementing renewable energy policies is the high cost of producing energy from renewable sources.

The 2008 National Strategy for Sustainable Development of the Agro-industrial Sector for the period 2008–2015 provides a series of measures aimed at combating land degradation through afforestation and creating new vineyards and orchards that may have an impact on the level of carbon sequestration and reduce greenhouses gas (GHG) emissions. The 2011 National Programme for Conservation and Improvement of Soil Fertility for 2011–2020 provides for measures to prevent soil erosion by restoring green manure for soil protection, afforestation of degraded, highly eroded sloping grassland, and promotion of cultivation of grassy crops between rows in orchards and vineyards.

Sustainable water management

A policy framework on water management seems to be in place. The 2007 Strategy of Water Supply and Sanitation of Communities sets out specific medium-term (2008–2012) and long-term (2012–2025) objectives. However, the Strategy lacks a national water action plan and lacks financing.

Access to sewerage systems is increasing slowly, from about 42 per cent in 2005 up to about 50 per cent in 2012. With such slow progress the country will hardly meet its national MDG target of 65 per cent of the population with access to improved sewerage set for the year 2015.

The situation regarding wastewater treatment in the country is very bleak. In 2010, only 17 of 198 wastewater treatment plants (WWTPs) (9 per cent) were in a satisfactory state, 112 (56 per cent) require repair and 69 (35 per cent) required full refurbishment. Most WWTPs operate de facto with mechanical treatment only. As a result, discharges from WWTPs into water bodies contain organic substances, ammonium and nitrates. A lot of industrial WWTPs are old and obsolete. Currently, a huge amount of untreated industrial wastewater is discharged into rivers.

Waste management

Waste management in the Republic of Moldova has developed only moderately since 2005. The current waste management practice relies on disposal in dumpsites. These are, in the majority of cases, small, uncontrolled and operating without an environmental permit.

Good progress is observed in reducing the number of illegal dumpsites. As a result of the efforts of environmental authorities, the total area under unauthorized dumpsites has decreased from 61 per cent in 2001 to only 31 per cent in 2009. The total number of unauthorized dumpsites also recorded a downward trend from 1,356 in 2001 to 854 in 2009 and their share of all dumpsites from 73 to 46 per cent.

Although there is no national approach to material recovery from municipal solid waste, a number of private companies are introducing systems for collection of recyclables. However, the main source of secondary raw material in the Republic of Moldova is waste from paper or plastic production. Also, several municipalities are introducing separate collection of recyclables in the form of pilot projects.

International donors increased their involvement in waste management during the last few years and this resulted in improvements in the management of obsolete pesticides and expired chemicals, but overall management of municipal and manufacturing waste is developing slowly and old practices remain.

Biodiversity and protected areas

Only about 2 per cent of the country's grassland ecosystem is still covered by natural or semi-natural habitats. This low percentage is additionally fragmented; intensive agriculture has pushed the ecological integrity of steppe habitat to its limits. Currently, natural steppe communities have been preserved only in small and isolated areas; five protected areas preserving steppe vegetation exist, with a total area of less than 1 per cent of the country's surface. This figure is too low to protect the gene pool of steppe plant communities in the Republic of Moldova. The biodiversity of the steppe has been particularly altered and affected due to intensive grazing, soil erosion and salinization, and intensive use of fertilizers.

The lack of viable habitats of significant size is certainly the most significant threat to biodiversity of each of the country's ecosystems providing the required space for in situ conservation. The status of flora diversity, in particular in steppe ecosystems, remains unsatisfactory throughout the country due to intensive agriculture.

Invasive species are posing another threat. Of the invasive plant species, about 130 species are damaging crops and 15 species are damaging trees. Annual losses in agriculture that are caused by invasive species are from 5 to 10 per cent of cereal crops, 15.2 per cent in weeding plants and 25 per cent of multicultures.

The negative consequences of intensive land use remain unchanged in comparison with 2005. These include erosion and landslides, conversion of steppe, soil salinization and drainage of wetlands or improper grazing management. Yet, a steady development of organic agriculture is leading to the creation of favourable conditions for biodiversity conservation.

Since 2005, wetlands have received significant attention, reflecting the economic and ecological importance of the ecosystem. The designation of three wetlands of international significance – Ramsar sites – offers the chance for increased species and habitat conservation measures.

Between 2007 and 2010 the Agency "Moldsilva" undertook several activities to restore or establish forest/wooded lands. Activities for forest regeneration (reforestation of trees) on the National Forest Lands (NFL) took place on about 3,500 ha. Additionally some 20,000 ha of degraded sites, not previously forested, have been afforested as an approach to combat desertification and erosion as well as provide alternative fuel wood sources. On some 10,000 ha of the NFL "natural regeneration" was supported.

Agriculture and environment

Agriculture remains one of the main economic sectors despite its GDP share having diminished from 19.1 per cent in 2005 to 14.4 per cent in 2011. In 2011, agriculture employed about 28 per cent of the labour force. Agro-food exports constitute about 45 to 50 per cent of total exports and are backed by the export-oriented agro-processing industry, which produces approximately 7 to 8 per cent of GDP.

The land use structure in the country has not changed significantly since 2005. The land cover under orchards decreased by 22.2 thousand ha (some 14 per cent) and that under pastures by 20.4 thousand ha (5.5 per cent). At the same time, the land cover under forests increased by 23.6 thousand ha (some 5 per cent) and fallow lands by 24.1 thousand ha (some 240 per cent). This illustrates the process of many owners abandoning land. On some of the abandoned land natural reforestation takes place.

The most severe drought in the Republic of Moldova in living memory took place in 2007, impacting upon 80 per cent of the country's territory and including widespread crop failures and food shortages. Household production from home gardens, a mainstay of food supply for most rural families, also reduced sharply. In monetary terms the losses for the agricultural sector were estimated at close to US$1 billion. The greatest losses were experienced by fruit and vegetable growers (US$550 million), livestock producers (US$305 million) and cereal growers (US$132 million).

Since 2005, areas affected by soil erosion remain at the same level. Soil degradation is estimated to cause US$239 million in economic damage each year, including losses from erosion, landslides and in ravines, and agricultural production losses. Subsistence farming households, which cannot afford to address the problem, are particularly affected by erosion and soil fertility losses.

INTRODUCTION

I.1 Demographic and socioeconomic context

Population

The demographic indicators of the Republic of Moldova have not changed much since 2005. The total resident population has remained unchanged at 3.6 million. However, a significant part of the country's population lives abroad. The United Nations Department of Economic and Social Affairs estimates that about 22 per cent of the Moldovan population resides outside the country – compared with a 3.1 per cent global average.

Economic development

The Republic of Moldova's Gross Domestic Product (GDP) per capita is the lowest in Europe. Nevertheless, on average, per capita GDP development has been good since 2005. GDP per capita in national currency terms more than doubled between 2005 and 2012, while in 2005 Purchasing Power Parity (PPP) US$ terms it grew an impressive 26.4 per cent from 2005 to 2011. However, GDP development has not been smooth. In the middle of the review period, the GDP growth rate plunged after the 2008 global financial crisis. The 7.8 per cent growth in 2008 changed to a 6 per cent contraction in 2009. This contraction was very short and the economy returned to 7 per cent GDP growth in 2010 and 6.4 per cent growth in 2011. In 2012, the upswing ended and the economy contracted by 0.8 per cent.

The economy is dependent on foreign trade and affected by the economic performance of the country's trading partners. In 2012, exports of goods and services accounted for 43.8 per cent of GDP and 51.9 per cent of the exports went to the EU area. The crisis in the EU countries reduced the demand for Moldovan exports in 2009, transmitting the Eurozone crisis to the Moldovan economy, but exports recovered in 2010 and increased 75 per cent between 2009 and 2012.

Agriculture is one of the main economic sectors and a major contributor to the economy. In 2011, agriculture employed about 27.5 per cent of the labour force. Agro-food exports constitute about 45 to 50 per cent of total exports and are backed by the export-oriented agro-processing industry, which produces approximately 7 to 8 per cent of GDP. The 2006 ban on Moldovan wine imports to the Russian Federation and the unprecedented 2007 drought were a severe blow to the Republic of Moldova's economy, but also pushed the country to diversify its export markets. With the ban lifted and the restrictive regulations on wine, wheat, oil seed and new manufactured exports eased, the export sector grew rapidly and the higher export income both from the increased access to EU markets and the higher prices for agricultural commodities such as vegetables, wine and tobacco led to GDP growth.

The Republic of Moldova's GDP structure has changed since 2005. Agriculture's GDP share diminished from 19.1 per cent in 2005 to 12.8 per cent in 2012. A similar decrease took place with regard to industrial production – from 18.3 per cent in 2005 to 16.4 per cent in 2014. GDP share of the construction industries stayed the same while the share of services increased from 58.7 per cent in 2005 to 66.7 per cent in 2012.

Due to the large proportion of the Republic of Moldova's labour force working overseas, the massive inflow of workers' remittances has played a very important role in the country's economic development. Workers' remittances made up 30.6 per cent of the Republic of Moldova's GDP in 2005. This extremely high figure diminished somewhat over the review period to 22.8 per cent of GDP in 2011. Because of the exodus of the working-age population, the national unemployment rate has in general been low. The 4 per cent unemployment rate in 2008 went up to 7.4 per cent in 2010 but decreased to 5.6 per cent in 2012.

Poverty eradication

In 2005, about 29 per cent of the population were living below the national poverty line. By 2008, the figure had dropped to 26.4 per cent. In 2009, when workers' remittances declined due to the global financial crisis, the general level of poverty remained practically unchanged compared with 2008. This was largely because of unchanging price levels and a growth in public assistance to support household income.

After 2009 poverty levels declined significantly and in 2012 the proportion of the population below the national poverty line had dropped to 16.6 per cent, a fall of 9.8 percentage points compared with 2009. The main reasons for the falling poverty rate were related to increased agricultural production, increased

prices for agricultural products and more efficient targeting of social benefits to the most vulnerable population groups.

The Republic of Moldova's score on the UNDP's human development index (HDI) was 0.660 in 2012, placing it in the group of countries with medium human development. The Republic of Moldova ranked 113th of the 187 countries compared, while its HDI was below the regional average (0.771) for Europe and Central Asia.

Gender

Infant mortality rates in 2005 were almost equal by gender: 12.5 per thousand for boys and 12.3 per thousand for girls. In 2011, the mortality rate had increased slightly to 13.6 per thousand for boys but diminished to 8.2 per thousand for girls. There is almost no discrepancy between immunization rates for girls (84.8 per cent) and boys (85.9 per cent). Malnutrition rates among male and female children are not significantly different.

Access to education is identical for both genders. All men (100 per cent) and 99.4 per cent of women aged 20-24 complete either secondary or higher education. These figures exclude the Roma, whose school attendance and completion rates are much lower than average.

Women are underrepresented in decision-making bodies. Only 19.8 per cent of Members of Parliament were women in 2012. Although this is higher than in neighbouring Ukraine (9.4 per cent), for example, it is still a relatively low figure. At the local level, women hold 17 per cent of the district municipal council positions.

I.2 Key environmental trends

Air and climate change

Air quality and air emissions

The total volume of air pollutants emitted from stationary sources decreased 24 per cent between 2005 and 2010. In the long term there has been a significant reduction in the volume of emissions – the 34.7 kilotons of emissions in 2010 were about one tenth of the 1990 figure.

This positive development is not attributable to industry becoming cleaner than before, but, rather, to the reduction in total volume of industrial production. This does not bode well for the future – when industrial production picks up again, increased emissions will follow.

Total emissions of SO_2 more than doubled between 2005 and 2011, from 2,400 tons to 5,800 tons annually. Industrial SO_2 emissions remained stable and at a very low level (200 to 400 tons annually) throughout the period. Practically the whole SO_2 emissions increase was due to the increased emissions from transport. The bulk of the 2011 SO_2 emissions, 4,500 tons or about 77 per cent of the total, was produced by the transport sector.

The volume of air emissions from the transport sector, primarily from automobiles, has steadily increased due to both the increasing number of vehicles and more frequent and longer trips. The number of passenger cars increased 45.7 per cent from 2005 to 2011 while the road transport demand grew 49.5 per cent during the same period.

Mobile sources generate high quantities of hydrocarbon, carbon monoxide, nitrogen and sulphur monoxides, and the level of the emissions is dependent on several factors, such as fuel quality, mechanical condition of the cars and traffic congestion.

Mobile NO_X emissions increased from 20,000 tons in 2005 to 28,700 tons in 2008, then decreased to 15,800 tons in 2010 and increased again to 18,400 tons in 2011 when mobile NO_x emissions made up 92 per cent of total NO_X emissions.

There was a 45.5 per cent increase in emissions of non-methane volatile organic compounds between 2005 and 2011. Total emissions in 2011 were 1,600 tons.

Greenhouse gas emissions

GHG emissions have been rising slightly since 2005; total GHG emissions in 2010 were 2.6 per cent higher than in 2005. Total CO_2 emissions grew 6 per cent from 2005 to 2010.

In 2005, the energy sector produced 65 per cent of total GHG emissions. Emissions from the energy sector increased 5 per cent between 2005 and 2010 and, in 2010, the energy sector's share of the total had increased to 67 per cent. The growth rates of some parts of the energy sector were much higher. Between 2005 and 2010, GHG emissions from the energy industry and transportation increased 29.6 and 15 per cent respectively.

Emissions of CH_4 and N_2O are diminishing, mostly due to decreases in the use of synthetic and organic nitrogen fertilizers but also because of the declining number of domestic livestock. Between 2005 and 2010, CH_4 and N_2O emissions decreased 6.6 and 3.3 per cent respectively.

Water

Abstraction and use

Annual water abstraction has remained stable since 2005. In 2012, 850 million m^3 of water was abstracted; the majority (about 68 per cent) was used in industry, 14 per cent for household purposes and 5 per cent for irrigation. In addition to the limited water resources, low water use efficiency and water losses (7.5 per cent) are intensifying the overall water scarcity.

In 2011, about 99 per cent of the population in urban areas had access to improved water supply systems and the rural population's access rate was not much lower – 93 per cent. The main water source in rural areas remains groundwater extracted from private or public wells.

The average proportion of the population with access to sewerage systems increased from 34.2 per cent in 2005 to 56.7 per cent in 2011. About 90.7 per cent of the urban population was connected to sewerage systems in 2011, while the connection rate was only 31.4 per cent in rural areas. Pit latrines are still the most common sanitation system in rural communities.

Pollution

Total wastewater discharges decreased by 7.3 per cent from 2005 to 2011. Nitrate discharges diminished by 38.8 per cent and sulphates by 20.8 per cent, while chloride discharges increased by 12.3 per cent.

Drinking water quality

In spite of the decrease in discharges, drinking water quality is deteriorating. The percentage of samples not meeting sanitary standards grew from 52 per cent in 2005 to 72 per cent in 2011 in the case of water taken from the centralized sources of water supply. The sanitary situation of the decentralized water sources has stayed at the disappointing level of 83 per cent of the samples failing to meet standards.

The pollution sources of surface water are individual household sanitation systems, poorly treated or untreated municipal wastewater discharges, and leakages from agriculture and solid waste management sites.

Land

There has been no big change in the land use pattern since 2005. In 2011, arable land covered 53 per cent of total land area, permanent crops, comprising orchards and vineyards, accounted for 9 per cent, while pastures covered 10 per cent of the land area. The area of land under intensive agriculture has remained stable, while the area of meadows and pasture has diminished by about 12,000 ha since 2005.

Land degradation

Land degradation is a significant threat to the country's land resources. About 2 million ha of agricultural lands are situated on slopes with a variety of degrees of inclination, making them vulnerable to degradation. The Agency "Moldsilva", the public administrative body of forestry and hunting, estimates that 1.86 million ha of the arable lands are under the risk of erosion.

Figures from 2011 classified 877,000 ha – 35.1 per cent of the agricultural land area and 25.9 per cent of the total land area – as subject to erosion. About 4.6 per cent of the agricultural area and 13 per cent of the eroded land was seriously eroded. Land erosion is advancing by an average of around 7,700 ha a year.

The quality of soil is affected by the annual humus loss of between 5 to 7 tons/ha. In addition, the continuous diminution of the soil's nutrient reserves by 150 to 180 kg/ha/year is disturbing the nitrogen, phosphorus and potassium balance of the soil.

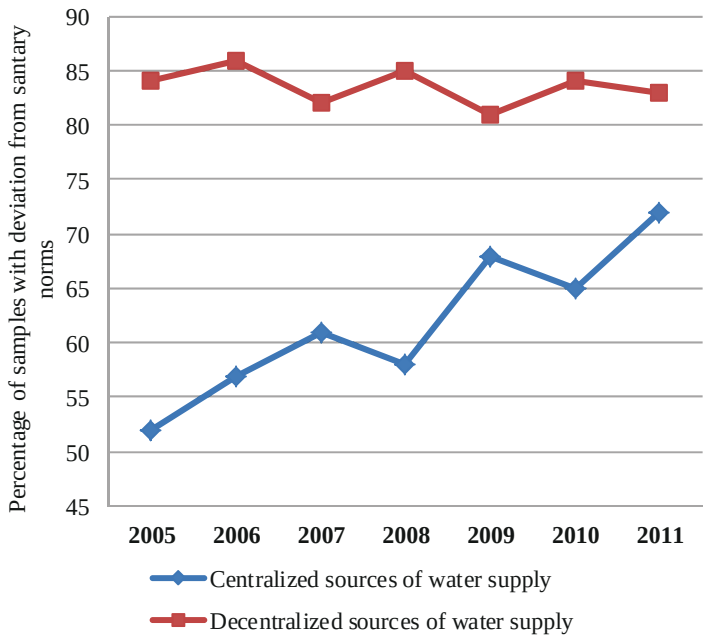
Biodiversity and protected areas

Forests

There has been no significant change in the composition or size of the forests since 2005. Over half (53 per cent) of Moldovan forests are planted and almost all the rest (46 per cent) are semi-natural. There are practically no undisturbed forests in the country. Between 2005 and 2012, forested area increased by 11,710 ha. In 2012, there were 423,710 ha of forests covering about 12.5 per cent of the country's territory. The amount of timber harvested officially between 2006 and 2010 ranged between 0.41 and 0.44 million m^3 annually. About 90 per cent of this harvested timber was used as fuel wood.

Photo I.1: Moldovan landscape

Figure I.1: Water samples deviating from sanitary norms, percentage



Source: Statistical Yearbook of the Republic of Moldova, 2012.

Illegal logging is a threat to the forests. According to official data of 2010, the volume of illegal logging was about 16,000 m³ in community forests, protection belts and other lands covered with forest vegetation outside the National Forest Lands (NFL) and about 4,000 m³ in forests managed by the Agency "Moldsilva".

Protected areas

The protected area (PA) network is small and not very well developed. In 2005, PAs covered 2 per cent of the country's land area. In 2007 this had increased to 4.8 per cent of the land area and it has remained at that level. The protected area is highly fragmented –

there are 312 protected sites with an average size of 516 hectares.

Flora and fauna

The number of mammals, fish and birds in the critical and dangerous situation categories increased from 64 in 2005 to 98 in 2010. The Republic of Moldova has 210 bird species of which 13 per cent were in a critical situation in 2005. The situation has worsened; in 2010 about 18 per cent of the bird species were in a critical situation.

Data for plant groups are very sparse. Seven lichen species were in a critical situation in 2010, more than double the number (three species) in 2005.

Waste and chemicals

The amount of generated municipal waste in 2012 was about 1.9 times higher than in 2005. Generated industrial waste, on the other hand, was only 70 per cent of the 2005 level, mainly due to the contraction of manufacturing industry.

The annual amount of recycled industrial waste fluctuates a lot. The recycling rate was 30 per cent in 2005 and 22 per cent in 2011. The end-of-year waste stock stored at the source increased from about 4.3 million tons in 2005 to 7 million tons in 2010.

The number of enterprises producing hazardous waste and the annual amount of hazardous waste increased over the period 2005–2009 but then diminished swiftly.

The volume of hazardous waste generated in 2012 was only 50 per cent of that in 2005. Hazardous waste accumulated in on-site storage facilities also diminished from 0.89 million tons in 2005 to 0.6 million tons in 2011.

Map I.1: Map of the Republic of Moldova

Source: United Nations Cartographic Section, 2011.

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

PART I: ENVIRONMENTAL GOVERNANCE AND FINANCING

Chapter 1

POLICYMAKING FRAMEWORK FOR ENVIRONMENTAL PROTECTION AND SUSTAINABLE DEVELOPMENT

1.1 Legal framework and its implementation

Since 2005, few environment-related laws have been adopted in the Republic of Moldova. The environmental legislation adopted before 2005 did not change in the period under review apart from amendments related to administrative changes.

The 2007 Law No. 94-XVI on the National Environmental Network (NEN) creates the legal framework for the establishment, development, management and protection of the network, as part of the Pan-European Ecological Network and of local ecological networks.

The 2008 Code No. 218 on Offences ("Contravention Code") establishes the general and specific principles and provisions to be applied to contraventions and sanctions. The Code incorporates a specialized chapter on environmental offences consisting of 49 articles. Fines for non-compliance are calculated according to the instructions under the sections on permitting, compliance and enforcement.

The 2009 Law No 10-XVI on the State Supervision of Public Health states that atmospheric and indoor air shall not pose risks to human health. Zones of sanitary protection shall be established around industrial enterprises, at a certain distance from protected areas, public recreation areas, and health care and education institutions, as well as residential areas. The Law also stipulates that atmospheric and indoor noise levels, vibration, and other factors present in places with the permanent or temporary presence of humans should not pose a risk to human health.

The 2011 Law No. 272 on Water, in force from October 2013, includes provisions on river basin districts, the establishment of administrative arrangements for international waters, analysis of river basin district characteristics, undertaking preliminary flood assessment, preparation of flood hazard maps and flood risk maps, establishment of flood risk management plans, establishment of water quality monitoring programmes, river basin management programmes and consultation with the public. For its implementation, the Law on Water requires the development of some 20 subsequent regulations. Several draft regulations under the Law on Water have already been developed: on identification, delimitation and classification of water bodies; on surface water protection; on development and approval of a management programme and action plan; on procedures for the development and updating of water resources monitoring programmes; and on river basin committees.

In sectoral laws, of note are laws connected with renewable energy, agriculture, health and forestry. There are two major documents on renewable energy policy: the 2007 Law No.160-XVI on Renewable Energy, and the 2010 Law No. 142 on Energy Efficiency, which provides, inter alia, for the establishment of an energy efficiency agency.

In the agriculture sector, a series of laws has been adopted since 2006 regulating activities related to environmentally friendly agriculture management and product safety, including regulation of genetically modified organisms (GMOs). These are the 2006 Law No. 422-XVI on General Safety of Products, the 2007 Law on Organic Agro-food Production, the 2007 Law No. 221-XVI on Veterinary and Sanitary Activities, and the 2010 Law No. 228 on Protection of Plants and Phytosanitary Quarantine.

The 2006 Law No. 149-XVI on Fishery, Fishing and Fish Farming regulates the conditions for the creation and protection of fisheries, fish reproduction, and the growth and acquisition of hydrobionts, and establishes principles of public authority activity in managing aquatic biodiversity.

In the health sector, the 2007 Law No. 221-XVI on Veterinary and Sanitary Activities has general provisions concerning the regulation of residues of animal origin. In 2007, through Government Decision (GD) No. 618, the Government approved the list of indicators of sustainable forest management.

Photo 1.1: Presidential palace

Draft environmental laws

According to the 2012 Action Plan of the Government for 2012–2015 (GD No. 289) for the harmonization of the legislation with EU directives, 25 environmental legislative acts and 35 by-laws are expected to be approved by the end of 2014.

Its adoption is expected to trigger a substantial reform of the entire environmental legal framework towards a more integrated approach to environmental protection, implying a further convergence with EU legislation with the purpose of accelerating the compatibility of national legislation with the *acquis communautaire*.

If adopted, the draft law on waste, which is under consideration by the Government, will establish a new regulatory framework for waste management. The draft law provides for a waste management system and plans, waste prevention programmes, specific obligations on hazardous waste management and a permitting system.

It includes requirements on packaging and packaging waste, the management of end-of-life vehicles, electrical and electronic equipment, waste incineration, etc.

1.2. Strategies, programmes and related action plans, and their implementation

Environment

Currently, there is no environmental strategy in the country. With the support of UNDP, a national environmental strategy for 2013–2023 was drafted and it is expected to be adopted. The policy priorities for 2013–2023 aim at substantial effective reform of environmental policy at least cost. Priorities would concentrate on developing key sectoral strategies and investment plans, and modernization and improvement of information, monitoring and enforcement systems. In the medium to long term the focus is on the extension and continued modernization of environmental infrastructure for key sectors such as water, waste and urban air pollution. According to the 2012 Action Plan of the Government for 2012–2015 (GD No. 289) the strategy and nine supplementing documents are to be finalized for government consideration in the first quarter of 2014.

In addition, the Ministry of Environment is currently developing the following strategic documents: biodiversity strategy, air strategy, and water supply and sanitation strategy. They are expected to be submitted for adoption by the end of 2013.

The country is developing a national climate change adaptation strategy and a low emissions development strategy (chapter 6).

Sustainable development

Despite the institutional developments, sustainable development (SD) has not yet emerged as a core principle of policy development in the Republic of Moldova. An integrated approach towards SD is only slowly emerging, with policy planning still following a sector-based approach: the Ministry of Economy is responsible for economic development and energy, the Ministry of Labour, Social Protection and Family for social development, social inclusion, and gender-equal rights, the Ministry of Health for human health issues (drinking water quality), and the Ministry of Environment is accordingly responsible for the environmental policies.

Often adopting an "environment-centred" definition of SD, the Ministry of Environment is the most dedicated advocate of SD in the Interministerial Committee for Strategic Planning and in more general policy discussions. However, the Ministry's task of promoting SD is difficult considering that environmental requirements are frequently seen in the country to be a liability rather than an asset improving social well-being. At the same time, there is little understanding of green economy opportunities; indeed, "greening the economy" is often perceived by many public officials as something that they have to do in addition to, rather than as an alternative paradigm for, the economic development of the country.

According to the Second Millennium Development Goals Report: Republic of Moldova (2010), under MDG7 "Ensure environmental sustainability", only two of the five targets (reduce degradation of natural resources and increase forested areas; and increase the share of protected areas to preserve biological diversity) can reach planned levels in 2015.

Other targets will likely be implemented, except for two targets of MDG2 "Achieve universal primary education" and one target from MDG6 "Combat HIV/AIDS, malaria and other diseases".

The 2012 National Development Strategy (NDS): Seven Solutions for Economic Growth and Poverty Reduction creates a vision of cohesive, long-term (2012–2020) sustainable economic development. The seven priorities of the Strategy are: (1) Education: studies relevant to a career; (2) Good roads; (3) Accessible and inexpensive finance; (4) Clear and appropriate rules for business; (5) Safely delivered and efficiently used energy; (6) Equitable and sustainable social insurance; and (7) Responsible and incorruptible justice. It is expected that the implementation of the Strategy's priorities, considering the direct and quantifiable effects of each priority, will supplement the annual growth rate by more than 1.2 per cent annually. According to this document, poverty is to be reduced from 22 per cent of the population in 2010 to 14 per cent in 2020.

Sectoral development

The Government is continuing to prioritize reforms towards alignment with EU standards and regulations. As a result of these priorities, human welfare moved to the centre of the Government's agenda and reform efforts in a number of areas. This reform agenda is reflected in the Government Activity Programme for the period 2011–2014 "European Integration: Freedom, Democracy, Welfare".

Within the Government Activity Programme for the period 2005–2009 "Modernization of the Country – Welfare" (Economic Growth and Poverty Reduction Strategy Paper), several sectoral strategies with a possible impact on environment were developed.

The Agricultural and Food Sector Development Strategy for the period 2006–2015 sets the ambitious target of doubling Moldovan organic production and tripling certified farmed areas by 2015. Since 2005, approximately 11,000 ha (including 5,000 ha of vineyards) nationwide have been certified as organic. More specifically, the Strategy calls for approximating EU legislation on organic farming and products, supporting organic farming through extension services and academic and research institutions, creating pilot farms and supporting farm conversion, and providing training for farmers.

The National Strategy for Sustainable Development of the Agro-industrial Sector for the period 2008–2015 deals with overall coordination at national level of the main political, economic and social actions for the development of the agro-industrial sector, including the development of organic agriculture.

The Industry Development Strategy for the period 2006–2015 sets out principles, objectives and priorities for the development of industry and key mechanisms and instruments for its implementation. The main objective of this Strategy is to create a technologically advanced industrial sector of the economy, science intensive, efficient and competitive, connected with European standards. Among other objectives the Strategy aims at

"ensuring environmental protection and rational use of natural resources".

The goal of the National Energy Efficiency Programme (NEEP) for the period 2011–2020 approved by GD No. 833 in 2011 is to implement the provisions of the Energy Strategy of the Republic of Moldova until 2030 (GD No. 102 of 5 February 2013). The NEEP establishes policies and priority actions to be implemented in the period 2011–2020 to address the challenges of increasing energy prices, dependence on imported energy resources and energy sector impacts on climate change. It stresses the need to conduct public awareness campaigns to encourage people to use energy rationally and to knowingly take purchasing decisions regarding utilities, building materials, housing, household appliances and energy-related products. The Programme is supported by National Action Plans for energy efficiency adopted every three years.

The National Health Policy for the period 2007–2021 sets as one of its specific objectives the creation of a healthy and safe environment. The policy determines a range of needs to ensure environmental sanitation in accordance with the requirements of MEAs and EU legislation. The National Strategy for Consumer Protection for the period 2008–2013 sets targets which are connected to many environmental issues, such as manufacturing environmentally friendly long-life containers, liability for the damage caused by an inadequate product, and promotion of organic products.

Implementation reports

Knowledge of the implementation status of different strategies and programmes is very limited. The 2007 GD No. 33 on the procedures and rules for the elaboration of policy documents requires, inter alia, the monitoring and evaluation of implementation of the policy documents. Despite this, it is hard to find any report on the progress of implementation of these policy documents. Progress reports are available for policy documents the implementation of which is funded by donors.

1.3 Strategic environmental assessment, including public participation

The term "strategic environmental impact assessment" (SEA) does not exist in the national legislation. However, the 1996 Law No. 851-XIII on Ecological Expertise and Environmental Impact Assessment (EIA), requires the assessment of environmental impacts of programmes, plans, schemes, strategies and concepts, which is common international practice of SEA. The Law does not incorporate provisions on procedures to decide when and how plans or programmes require SEA. The Law provides for the possibility of a public assessment, which can be undertaken by registered local associations. Public assessment can be carried out at any time prior to the implementation of any State ecological expertise, but the results have an advisory character. The Republic of Moldova signed but has not ratified the Protocol on Strategic Environmental Assessment (Kiev, 2003) to the Espoo Convention on Environmental Impact Assessment in a Transboundary Context.

The draft environmental protection law has provisions on the scope, objective, tasks and procedure for EIA. Also, EIA draft law is under consideration of the parliament. As regards SEA, a preliminary assessment indicates that the draft environmental legislation does not appear to provide for procedures and arrangements comparable to those established at the international level.

1.4 Green economy initiatives

The promotion of the green economy was the subject of debates in the parliament in 2010. The inclusion of the promotion of green economic development as the major objective of the draft environmental strategy for 2013–2023 demonstrates the commitment of the Republic of Moldova towards the promotion of this development model.

According to the recent survey on green economy by the United Nations Environment Programme (UNEP), the Republic of Moldova is the country in the Eastern Europe, Caucasus and Central Asia region with the most developed organic sector, both commercially and in terms of policy and government involvement. The organic sector does not have a long history, but combined efforts by NGOs, private investors and the government have led to the Republic of Moldova exporting around 32,000 tons of organic produce at a value of US$48 million in 2009, representing 11 per cent of its total agricultural exports, and all this accomplished in seven years. The area of certified organic land represents almost 2 per cent of the total arable area.

In 2011, the European Bank for Reconstruction and Development (EBRD) and the Government of the Republic of Moldova signed the Sustainable Energy Action Plan and the Bank provided technical assistance throughout the year on issues such as tariff methodology reform and renewable energy. The independent energy regulator is now working on a roadmap to remove the barriers for deployment of

renewable energy sources in the Republic of Moldova. The EBRD's Moldovan Residential Energy Efficiency Financing Facility (MoREEFF) provides €35 million in loans to local banks for financing residential energy efficiency improvements. MoREEFF is supported by a grant of €5 million provided by the European Union Neighbourhood Investment Facility (EU NIF) and €2.3 million from the Swedish International Development Cooperation Agency (SIDA) to be used for technical assistance and investment incentives for households.

About €25 million is to be invested in the construction of the Republic of Moldova's first biogas production plant. Its production capacity is 16 million m^3 of gas from biomass per year.

The recently established Energy Efficiency Fund (EEF) functions as an independent legal entity and is overseen by an administration council composed of representatives of the government, private sector and donors. According to the provisions of the EEF regulation, the resources of EEF are going to be spent on several key priorities including energy efficiency in industrial processes, buildings' energy efficiency and energy efficient heating solutions (chapter 3).

1.5 Institutional framework for environment and sustainable development

Environment

The Ministry of Environment is the central public administration body that develops and promotes the State policy on environmental protection and rational use of natural resources. Figure 1.1 shows the central apparatus of the Ministry and figure 2 the subordinated bodies. The competences of the Ministry of Environment (until 2009, the Ministry of Environment and Natural Resources) are determined in the 2009 GD No. 847 approving the Regulations on organization and functioning of the Ministry of Environment, its structure and central staff numbers.

The Strategic Development Programme of the Ministry of Environment for 2012–2014 is the main medium-term document that describes the Ministry's activities to achieve the government policy priorities reflected in the national strategic documents. Activities designated in this document are the basis for the medium-term expenditure framework (MTEF), which itself is a basis for the annual budget and annual work plan of the Ministry.

The following departments carry out the key functions of the Ministry: the Department of Analysis, Monitoring and Policy Evaluation helps improve the efficiency of the Ministry by ensuring coordination of, monitoring, evaluation and reporting on the implementation of policy documents on environmental protection and sustainable use of natural resources; the Department of Pollution Prevention and Waste Management develops and promotes the State policy on pollution prevention, waste management and chemicals; the Department of Natural Resources and Biodiversity develops and promotes the State policy on rational use of natural resources, conservation of biodiversity, protected areas and biological security; the Department of Water Management develops and promotes the State policy on water supply and sanitation and water management. The Ministry of Environment coordinates the implementation of multilateral environmental agreements (MEAs).

There are several institutions subordinated to the Ministry of Environment (figure 1.2). The Agency for Geology and Mineral Resources (AGMR) is the central administrative authority specialized in the exploration, monitoring, regulation and control of the use of mineral resources in order to implement State policy on geological exploration, and the rational use and protection of subsoil.

The Agency "Apele Moldovei" is the administrative authority in charge of the implementation of State policy on water resources management, hydro-amelioration (land improvement) and water supply and sanitation.

The National Agency for Regulation of Nuclear and Radiological Activities regulates the nuclear and radiological activities.

The State Ecological Inspectorate (SEI) issues the authorizations in respect of emissions into the air and concerning the special use of water, and performs the State ecological expertise and State control regarding compliance with environmental legislation requirements. The Inspectorate has territorial units (four ecological agencies in Chisinau, Balti, Cahul and administrative Territorial Unit Gagauzia, and 31 ecological inspections in districts) (chapter 2).

The function of the State Hydrometeorological Service (SHS) is to conduct the monitoring of hydrometeorological conditions and environmental quality, in particular of surface water quality, atmospheric air quality, the radioactive state of the environment and soil quality, and to conduct weather forecasting (chapter 4). The Institute of Ecology and Geography is a scientific institution which is also co-subordinated to the Academy of Sciences of the Republic of Moldova.

The Fisheries Service is responsible for regulating fishing and fisheries as well as preventing poaching in natural water bodies.

Other subordinate institutions include the Hydrogeological Expedition in the Republic of Moldova (EhGeoM).

The effectiveness of the functioning of the Ministry is questionable. Different units have overlapping functions, especially on water issues, while there is no clear responsibility on air protection. There is a lack of capacity in terms of financial and human resources. From 2005, the staffing of the central apparatus of the Ministry doubled, from 25 to 51, but workload also increased considerably due to the approximation process. Due to low salaries, skilled staff are often looking for other job opportunities. The Inspectorate promotes conflicting interests (permitting as well as control over permit requirements).

Environment-related functions of sectoral public authorities

Under the Ministry of Economy:

- The Consumer Protection Agency performs surveillance and State control over observance of legislation on consumer protection;
- The Principal State Inspectorate for Technical Supervision of Dangerous Industrial Objects performs technical inspection and supervision of the State to verify the security of dangerous industrial objects in respect of, for example, transportation, storage and use of explosives, and mineral raw material processing and enrichment, and exercises control over compliance with the requirements of legal acts;
- The Agency for Energy Efficiency implements policy on energy efficiency and renewable resources, ensures the implementation of national laws and regulations and programmes for energy efficiency and renewable energies, and coordinates relevant activities.

The Ministry of Agriculture and Food Industry develops and promotes organic production, enhances food safety, organizes plant protection and plant quarantine, controls the presence of GMOs in food of animal origin and feed together with the Ministry of Health and Ministry of Environment, and develops plant and veterinary control systems.

The Ministry of Health is responsible for the implementation of laws which are related to the impact of pollution on human health.

The Agency “Moldsilva” is the central administrative authority subordinated to the government with the responsibility to develop, promote and implement government policy on forestry and hunting, protection of forests and wildlife, and biodiversity conservation. The structure of the Agency includes 25 subdivisions, including 16 forest and four forest-hunting enterprises, four natural reserves and the Forestry Research and Management Institute. Within these units there are 5,245 employees.

Sustainable development

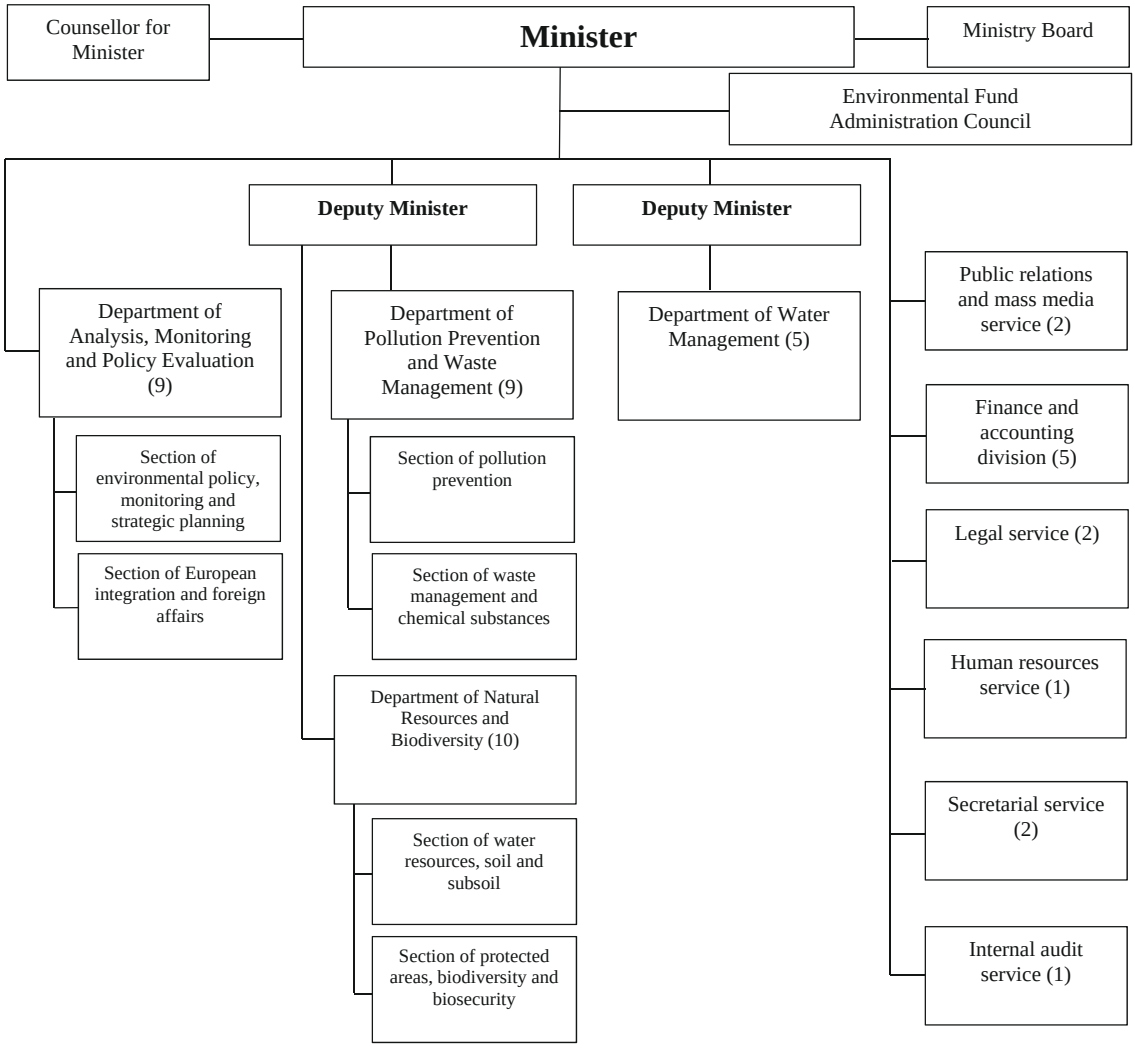
The National Council for Sustainable Development and Poverty Reduction was established in 2002 by presidential decree. It was conceived as a consultative body advising on how to ensure socioeconomically sustainable development of the country and to improve the living standards of the population. Despite formally functioning until 2008, the Council failed to have any meaningful impact on development programmes or to properly monitor the implementation of national strategies. Due to the extended political crisis, the Council has not been active since 2009.

Horizontal coordination and sectoral integration mechanisms

In order to provide strategic thinking and better public policy coordination, the Division for Strategic Planning, Policies and Aid Coordination (DSPAC) was established in the State Chancellery. The DSPAC is responsible for coordination of all public institutions in monitoring the implementation of the NDS, sectoral strategies and development programmes, and revising all public policy documents and, together with the Ministry of Finance, coordinating them with the MTEF.

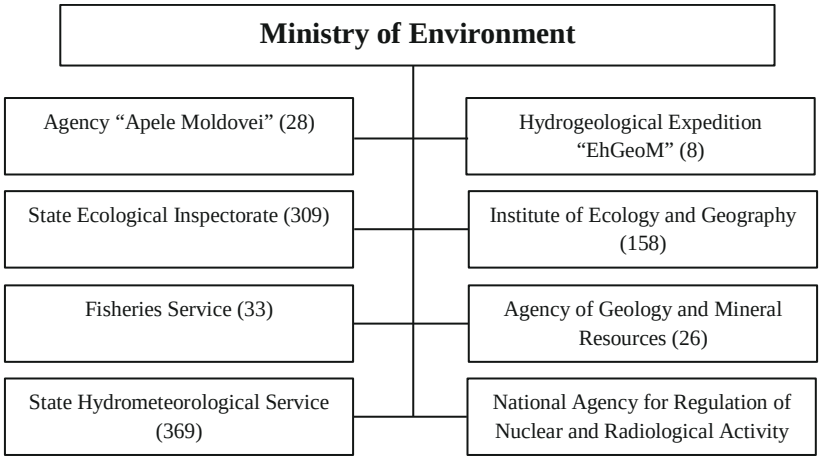
The DSPAC is working closely with the National Participatory Council (NPC) established by the Government in 2010. The NPC is composed of representatives of the 30 most active civil society organizations (two are environmental NGOs) and represents a forum where civil society can monitor policy implementation and consult/influence the government on public policy initiatives.

Figure 1.1: Central apparatus of the Ministry of Environment



Source: Ministry of Environment, 2013.
Note: Numbers indicate number of staff.

Figure 1.2: Institutions subordinated to the Ministry of Environment



Source: Ministry of Environment, 2013.
Note: Numbers indicate number of staff.

The Interministerial Committee for Strategic Planning (IMCSP) was created in 2008 to promote integrated planning and identify development priorities for overcoming the Republic of Moldova's limitations in implementing previous development strategies. The IMCSP is composed of 13 members from the Cabinet, including the Minister of Environment and two members from the State Chancellery.

The IMCSP has been attributed very important functions, including: coordinating the Government Programme and National Development Strategies; overseeing the Coordination Group for the development of the Mid-Term Budgetary Framework, the Regional Development Council and other governmental committees involved in strategic planning; ensuring dialogue with the National Commission for European Integration; and correlating the foreign assistance programmes with strategic national priorities.

Several cross-cutting issues on environment, such as water issues and protected areas, fall within the competences of other ministries and organizations. In this setting, there is little indication of progress in integrating environmental policy in relevant sectoral policies, although increased synergy is evident in some cases, e.g. the regulation of GMOs.

The legal environment for civil society has considerably improved in recent years. The 2008 Law No. 239 on Transparency of Decision Making determines the requirements to ensure transparent decision-making by all public authorities.

1.6 Conclusions and recommendations

The approximation process to the European *acquis* is at an early stage of development in the environmental area. Because of political instability over recent years, the effectiveness of the parliament's legislative work has declined. Despite the intensive drafting of legislation within governmental institutions, law endorsement by the parliament takes a long time. The draft environmental laws have been under consideration for two years.

Recommendation 1.1:
(a) The Government should promote the adoption by the parliament, without further delay, of the draft environmental laws based on the priority list prepared by the Ministry of Environment;
(b) The Ministry of Environment should ensure the development of the relevant secondary legislation.

Environmental dimensions have been included in several strategies, programmes and plans. The 2007 GD No. 33 on the procedures and rules for the elaboration of policy documents requires, inter alia, the monitoring and evaluation of implementation of policy documents. Despite this, it is hard to find any report on the progress of implementation of these policy documents. Progress reports are available for the policy documents the implementation of which is funded by donors.

Recommendation 1.2:
The Government should ensure that progress reports on the implementation of the environment-related national strategies and programmes are prepared and made available to the public.

The term "strategic environmental impact assessment" (SEA) does not exist in the national legislation. However, the 1996 Law on Ecological Expertise and Environmental Impact Assessment requires the assessment of environmental impacts of programmes, plans, schemes, strategies and concepts. The Law does not incorporate provisions on procedures to decide when and which plans or programmes require SEA.

Recommendation 1.3:
The Ministry of Environment should ensure the necessary arrangements for strategic environmental assessment (SEA) procedures to be included in the environmental legislation, taking into account the importance of SEA for the appropriate design of policy documents and the requirements of the European Union (EU) approximation process.

The National Council for Sustainable Development and Poverty Reduction was established in 2002 as a consultative body on socioeconomic sustainable development of the country. The Council formally functioned until 2008 but its activities had no meaningful results. Since 2009 the Council has not been active.

Recommendation 1.4:
The Government should reactivate the National Council for Sustainable Development and Poverty Reduction to promote sustainable development principles in all sectoral activities.

Although, since 2005, the staff of the central apparatus of the Ministry of Environment doubled, from 25 to 51, there is still a lack of capacity in terms of human resources. Different units have overlapping functions and the effectiveness of the functioning of the Ministry is questionable.

<u>Recommendation 1.5</u>:
The Government should, once the Environmental Protection Strategy has been adopted, revise the structure of the central environmental authorities to avoid the overlapping of functions and to make the institutional structure more effective by, in particular, the creation of an Environmental Protection Agency as an executive body for monitoring, information exchange and permitting under the Ministry of Environment.

Chapter 2

REGULATORY AND INFORMATION INSTRUMENTS AND THEIR ENFORCEMENT

2.1 Introduction

In the field of compliance and enforcement of environmental standards and requirements, moderate progress has been made by the Republic of Moldova since 2005. The staff of the main permitting and inspecting authority – the State Ecological Inspectorate – has been continuously reduced to date. The environmental legislation of the Republic of Moldova, consisting of more than 130 legal acts, regulates the protection of environmental media one by one. The system of integrated pollution prevention and control does not exist. Instead of the principle of environmental pollution prevention, the existing requirements are based on end-of-pipe control solutions. The prevention principle is foreseen in the new draft law on environmental protection which is largely based on EU environmental requirements.

On water and air, environmental quality standards from Soviet times are used. A huge number of standards are not in line with the current international requirements. Numerous pollutant substance regulations are mostly unenforceable, as they are far beyond realistic monitoring capacities. The air pollution permitting system is based on dispersion calculations. In the field of urban waste water permitting, EU standards are used based on EU Directive 91/271/EEC on urban wastewater treatment.

There is little indication of progress in integrating environmental considerations into sectoral policies. Compared with the previous EPR, only minor changes have taken place in this area. Nevertheless, there are many draft legal acts and reform plans in the pipeline to reorganize environmental compliance and enforcement.

2.2 Legal, policy and institutional framework

Sectoral policies

The Republic of Moldova's participation in international environmental agreements has contributed to the formulation of an environmental policy framework. The reform of public administration and regulatory framework for entrepreneurial activity has also influenced the development of environmental policy.

Various sectoral policy documents have been adopted since 2005, including:

- 2007 Concept of Settlements Sanitation;
- 2013 Energy Strategy of the Republic of Moldova until 2030;
- 2007 National Programme to Ensure Environmental Security for the period 2007–2015;
- 2007 Strategy of Water Supply and Sanitation of Communities for the period 2008–2025;
- 2009 Action Plan on Biosafety for the period 2009–2015;
- 2010 Action Plan on Road Traffic Safety Improvement.

The sectoral policy documents lack prioritization and, as no quantifiable environmental targets are established, they are not oriented to environmental improvements.

Permitting and compliance

Environmental permitting and enforcement in the Republic of Moldova are performed by the SEI, which is subordinated to the Ministry of Environment. The Agency "Moldsilva", the State policy institution for forestry and hunting, is in charge of issuing permits on forest-related issues. Other governmental agencies such as "Apele Moldovei" Agency, State Services for Public Health, and Agency for Geology and Mineral Resources (AGMR), are also involved in permitting procedures.

According to the 1993 Law No. 1515-XII on Environmental Protection, SEI performs State control regarding compliance with environmental legislation requirements. It also performs State ecological expertise and issues permits for emissions into the air and for the special use of water. There are 309 staff in SEI, of which 59 are in the central body of the institution and 250 are assigned to the territorial

units, which include four ecological agencies located in Chisinau, Balti, Cahul, and the Autonomous Territory of Gagauzia and 32 ecological inspections in the districts. The structure of SEI is presented in figure 2.1. The cutback of SEI staff has been continuous from 1998 when it had 521 employees. In 2005 the staff numbered 411.

The procedure of State ecological expertise is described in the 2002 Instruction No. 188 on the way of organizing and conducting State ecological expertise. It determines the scope, tasks, principles, objects and subjects of ecological expertise, order of ecological expertise organization and undertaking, requested urban and spatial planning documents, and the procedure for their presentation for review. The Instruction has not been amended since 2003.

Access to information and decision-making

The 2000 Law No. 982 on Access to Information still regulates the relationship between an information provider and an individual or legal entity in order to fulfil the constitutional right of access to information. Although the Law has the objective to ensure an effective public information process, in reality it is rarely implemented. The main shortcoming of the Law is that it does not provide clear mechanisms for public access to information. To date, no legal act on public access to environmental information has been developed.

The 2000 GD No. 72 approving the Regulation on public involvement in development and adoption of environmental decisions implements public participation requirements under the Aarhus Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters.

The 2008 Law No. 239 on Transparency of Decision Making determines the requirements to ensure transparency in decision-making by central government, local authorities and other public authorities, and regulates the relations between the public authorities and stakeholders with the purpose to ensure participation in decision-making. According to the Law, stakeholders are entitled to:

- Participate at any stage of decision-making;
- Request and obtain information on the decision-making process, including draft decisions and related materials in accordance with the Law on Access to Information;
- Propose to public authorities to initiate the development and adoption of decisions;
- Submit to public authorities recommendations on draft decisions under discussion.

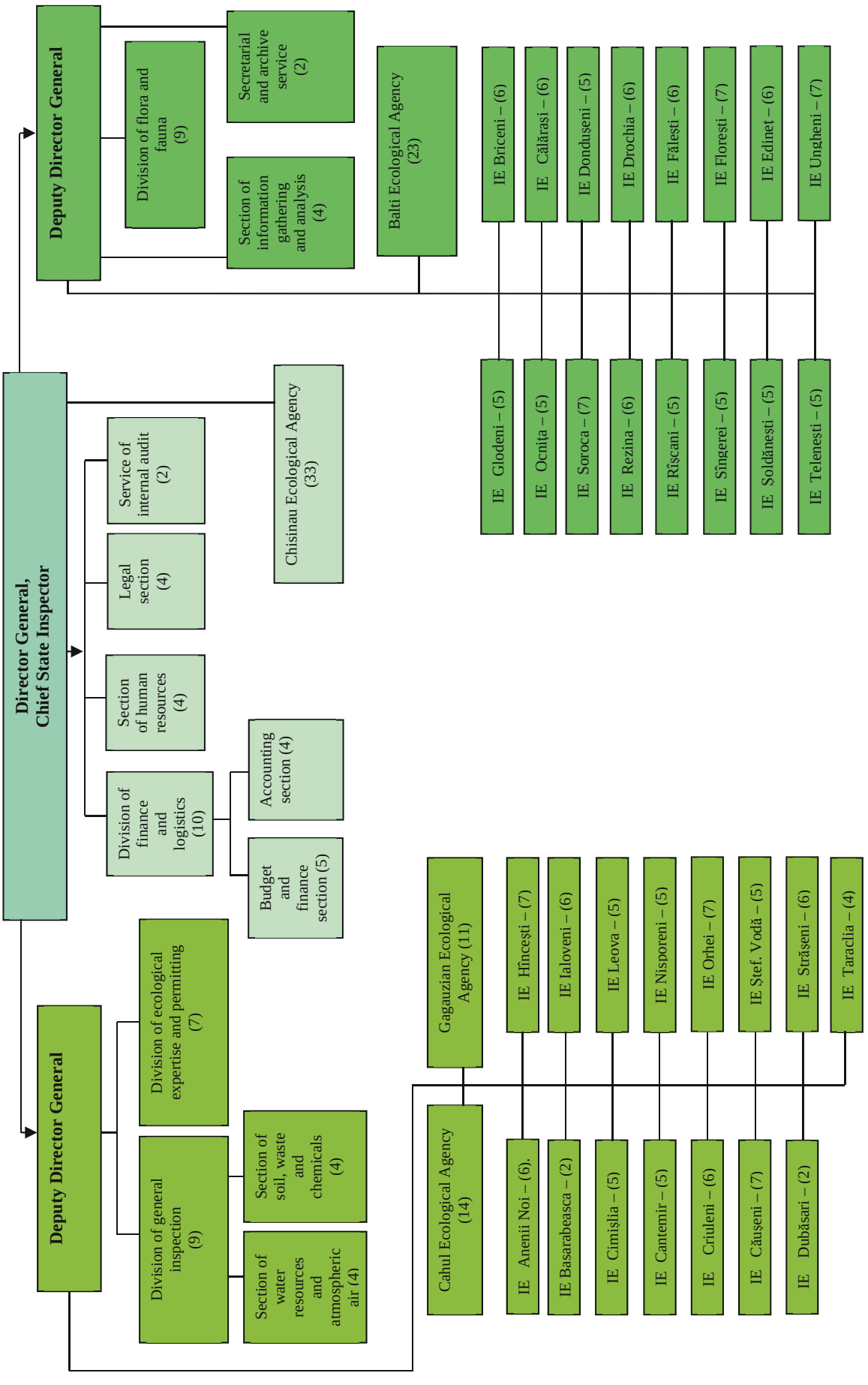
2.3 Environmental impact assessment and State ecological expertise

EIA and public participation issues are mainly regulated by the 1996 Law No. 851-XIII on Ecological Expertise and Environmental Impact Assessment. As this Law is quite outdated, it neither provides for sufficient public participation in decision-making nor ensures comprehensive assessments of potential impacts. Although the Law provides for public environmental expertise, this mechanism is rarely applied. The draft legislation (laws on environmental protection and EIA) foresees the full implementation of the principles of the EU Directive on EIA. The State ecological expertise is required for design and planning documents of all planned economic facilities and activities that affect or may affect the environment and/or require the use of natural resources, regardless of the purpose, location, type of ownership and volume of capital investments, funding source and how the construction works are undertaken.

The ecological expertise should also be performed for all draft legislation and other legal acts, instructions, norms and methodologies, regulations and standards which may affect the environment. In addition, international conventions prior to their ratification and draft concession contracts requiring use of the natural resources of the Republic of Moldova are subject to ecological expertise. The State ecological expertise is carried out by the Ministry of Environment or SEI depending on the types of projects examined. Public ecological expertise can be undertaken by registered local associations. These can be NGOs or groups of local people who form an association to implement a public evaluation. The State ecological expertise regarding new technologies and facilities, or those imported from other countries to be used for the first time in the design documentation, must be undertaken by the Institute of Ecology and Geography. The opinion issued by the National Institute is submitted for the State ecological expertise together with the project documentation.

EIA is required and must be carried out in advance of project design works for all proposed new facilities and activities that can significantly affect the environment, as listed in the Law.

Figure 2.1: Organizational chart of the State Ecological Inspectorate



Source: State Ecological Inspectorate, 2012.
Note: Numbers indicate number of staff.

Photo 2.1: Traditional Moldovan oven

The EIA report is subject to State ecological expertise. The organization and carrying out of the EIA at all stages of project planning and design, financing of the preparation of the EIA report, organization of public consultations on the proposed activity and submission of the EIA to State ecological expertise are the responsibility of the project developer.

2.4 Environmental permitting

The permitting of pollution of the environment and use of natural resources is performed by different institutions. Environmental permits are still based on single-medium approaches and do not consider the overall environmental impact of economic activities. As a result, an operator of an economic activity may need to obtain a range of environmental authorizations, sometimes from a series of public authorities. The same permitting system is used for all enterprises regardless of their size and pollution potential. The Ministry of Environment issues the following permits:

- Import, export or re-export of ozone-depleting substances (ODS);
- Spontaneous collection of plants, including natural medicinal plants;
- Acquisition of animals that are not subject to hunting and fishing (snails, frogs, lizards, snakes);
- Notification on the transboundary transport of waste;
- Waste management activities as set out in the 1997 Law No. 1347-XIII on Industrial and Domestic Waste;
- Environmental permits for the import of plants or animals of wild flora or fauna;
- Permits/certificates according to the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES).

The SEI is in charge of the following permits:

- Emission of pollutants into the atmosphere from stationary sources of pollution;
- Special water use, including water abstraction and wastewater discharge;
- Cutting trees and bushes outside forests.

The Agency “Moldsilva” issues permits for hunting on lands in the State Forest Fund, the capture of forest birds and animals, and the harvesting of plants, mushrooms and berries for sale.

Until the beginning of 2011, the Central Office of the 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. This is a step in the right

direction as it helps to reduce the conflict of interests in the territorial subdivisions of the SEI. To fully avoid such conflict of interests, it is necessary to keep the permitting and enforcement structures separate.

A permit is issued for a period of five years. In 2010, the SEI registered 1,297 water users, of which only 632 have permits. Permits are issued following an approval on water use by other governmental organizations, such as the Agency "Apele Moldovei", State Services for Public Health and the AGMR.

In accordance with article 12 of the 1997 Law No. 1422-XIII on the protection of atmospheric air, the SEI issues a permit to emit pollutants into the air from stationary sources. The basis for issuing air emission permits is the results of dispersion calculations which should prove that air quality limit values would not be exceeded even in the most unfavourable climatic conditions. To improve the effectiveness of regulation, the 2010 Order No. 110 of the Minister of Environment was adopted, on classifying businesses into categories based on the level of influence of pollutants on the air quality.

The SEI monitors enterprises for permit compliance through regular inspections and collects data on air pollution, water pollution and discharge, and waste disposal. To facilitate fast response there is a plan to acquire four mobile laboratories for regional inspectorates. The SEI has the role of collection and validation of reports on waste, air pollution and consumption of ozone-depleting substances (ODS). The reports of economic agents on waste and air pollution are later passed on to the National Bureau of Statistics (NBS) and reports on ODS to the Ministry of Environment. The licensing system of legal and physical persons who service, repair or decommission the equipment containing ODS was repealed in 2010. The main report on activity of the SEI, "Environmental Protection in the Republic of Moldova", is prepared yearly. It is produced in Romanian, published in print and also uploaded on the websites of the SEI and the Ministry of Environment.

The environmental permitting system is also influenced by the new legal acts adopted for the purposes of regulating entrepreneurial activities. The 2011 Law No. 161 on the Implementation of the Single Window in Business Activity improves the flow of information necessary for the provision of certain rights for the initiation, implementation and termination of business activities, as well as their rationalization. The legal acts to regulate entrepreneurial activities and that influence the environmental law enforcement adopted from 2005 include the:

- 2005 GD No. 920 on classification of permits and certificates issued by central administrative authorities and their subordinate bodies to individuals and businesses practicing entrepreneurial activities;
- 2005 GD No. 1030 on the register of official acts regulating entrepreneurial activity;
- 2006 GD No. 275 on approval of amendments and additions that are made in some government decisions and abrogation of normative acts;
- 2006 Law No. 235-XVI on the Basic Principles of Regulation of Business Activity;
- 2006 GD No. 1230 on the approval of the methodology of regulatory impact assessment and monitoring the effectiveness of regulatory acts;
- 2007 GD No. 104 on the approval of the strategy for State regulation of entrepreneurial activity reform.

2.5 Public participation

Pursuant to the 2008 Law No. 239 on Transparency of Decision Making, public authorities are obliged, where appropriate, to take steps in order to ensure opportunities for stakeholders' participation in decision-making, including to:

- Disseminate information on annual activity programmes (plans) by posting them on the official website of the authority, by displaying them at its headquarters in a publicly accessible space, and/or by making them available to national or local mass media where appropriate;
- Provide information on the decision-making process as required by legislation;
- Institutionalize mechanisms for cooperation and partnership with the public;
- Review recommendations submitted in regard to draft decisions;
- Consult all interested parties concerned with draft decisions.

In practice, these requirements are generally not implemented. The environmental permitting procedure is not transparent. The applications for environmental permits are handled within the SEI or Ministry of Environment and there is no public database available for public access through the

Internet. The issued permits are kept in paper format within the issuing authority. All international provisions on public participation and access to justice have been included in the draft environmental protection law.

Information instruments

Corporate social responsibility schemes are not implemented by any of the industries in the Republic of Moldova. There is a small indication of the use of environmental auditing according to ISO 14001 or the EU Eco-Management and Audit Scheme (EMAS). But there is as yet only one entity (Institute "Urban Project") known to the authorities which has done so in practice. Voluntary environmental reporting does not exist in the Republic of Moldova in general. There is one enterprise that does it – Lafarge cement plant. In collaboration with the Ministry of Environment (National Environmental Fund), Lafarge has installed an air monitoring station. Monitoring results are presented to the State Hydrometeorological Service. Neither an eco-labelling mechanism nor chemical labelling system are implemented in the Republic of Moldova.

2.6 Environmental standards

The existing national environmental legislation on industrial emissions lacks a systematic approach and is being focused on regulating the protection of environment in all sectors separately. An integrated approach to environmental compliance is still under development. The draft environmental protection law foresees general requirements for integrated permitting. Secondary legislation is envisaged, to be developed after the adoption of law. A draft law on industrial security of dangerous industrial facilities developed by the Ministry of Economy is largely based on the requirements of the UNECE Convention on the Transboundary Effects of Industrial Accidents and EU Directive 96/82/EC on the control of major accident hazards involving dangerous substances (Seveso II). Product standards do not exist in Moldovan legislation.

Air protection

National air-quality-related legislation and standards are outdated and not harmonized with international requirements. For instance, there is no requirement for the creation of short-term action plans for zones and agglomerations in which there is a risk that alert thresholds will be exceeded, or measures stipulating when and how to inform the public about air quality and countermeasures to be taken to reduce air pollution. In addition, air emission limit values (ELVs) for specific industrial processes are lacking. The draft environmental protection law incorporates provisions on zones and agglomerations, air quality assessment, and the establishment of upper and lower assessment thresholds, similarly to the procedure in the EU Air Quality Framework Directive. It also incorporates ELVs for specific industrial processes.

Water protection

The current legal measures related to the protection of surface and groundwater, nitrate pollution from agricultural sources and flood management are not compatible with international requirements. Water quality standards date from Soviet times. At the same time, the regulations on terms for urban wastewater discharge into natural recipients, adopted in 2008, are mostly compatible with the requirements of the EU Directive on Urban Wastewater Treatment. The ELVs set in the permits are based on the EU limit values. River basin management plans for the purposes of achieving good water quality status by a certain year are lacking.

2.7 Compliance assurance mechanisms

The SEI is mandated to undertake planned or unscheduled inspections for compliance control. The SEI may apply the following enforcement measures in accordance with legal provisions of the 1993 Law on Environmental Protection:

- Prescriptions for environmental performance improvement;
- Sanctions for non-compliance;
- Initiation of damage compensation processes;
- Operation suspension.

The economic instruments used for enforcement purposes primarily include environmental taxes for the use of natural resources, pollution charges and non-compliance fines. Pollution charges can be overcharged when the pollution is illegal (without a permit or exceeding the limits set by the permit). The imposition of fines in the administrative environment is regulated by Chapter IX, Offences in the field of environmental protection, of the 2008 Code of the Republic of Moldova No. 218 on Offences. Fines are reviewed periodically, and changes are made to legislation.

The SEI activity indicators (table 2.1) show that the total amount of fines imposed had risen more than 28-fold by 2012, compared with 2006 (the rate of lei having stayed approximately at the same level against US$).

Table 2.1: State Ecological Inspectorate activity indicators

	2006	2007	2008	2009	2010	2011	2012
Number of inspections	15,192	14,834	15,290	14,174	14,645	16,809	16,222
Number of violators	6,744	6,170	6,902	6,171	5,659	6,605	7,227
Number of infringements	6,867	6,214	7,301	6,344	5,583	6,605	8,228
Amount of fines imposed, lei	151,091	368,803	243,960	1,922,904	3,460,574	4,406,968	4,226,700
Amount of fines received, lei	78,235	181,450	155,761	931,386	1,676,805	2,072,223	2,412,421
Compensation for damage to the environment, lei	887,346	2,359,302	1,800,405	1,283,626	850,610	822,036	2,866,596
Compensation received, lei	255,640	551,802	575,921	438,604	545,138	474,455	720,381
Number of temporarily closed installations	82	37	50	10	34	27	26
Number of complaints	1,106	1,951	1,816	1,929	2,200	1,820	1,991

Source: State Ecological Inspectorate, 2012.

The amount of fines received is approximately 1.8 times less than the amount of fines imposed as, according to the legislation, violators who pay half of the imposed fine within 72 hours are not required to pay the rest of it.

Environmental liability and compensation are regulated by the 2008 Code on Offences ("Contravention Code"), Chapter IX, art. 109. Liability and compensation is also regulated by the 2002 Criminal Code of the Republic of Moldova No. 985-XV, Chapter IX, arts. 223-235. In addition, instructions on calculating the damage caused to atmospheric air, soil, water and fisheries have been adopted. Environmental insurance is not regulated.

Since the previous EPR in 2005, substantial capacity-building in the area of compliance monitoring and enforcement has taken place. During the period 2007–2010, the SEI conducted 57 training courses in which 493 environmental inspectors were trained. In order to improve the work of the monitoring subdivisions of the SEI – Ecological Analysis Centres – the equipment, chemicals and laboratory supplies were modernized. This presented the opportunity to raise the quality of analyses performed.

Ministry of Environment has approved all standard methods for analysis of water, air and soil. Currently, the Centres work with mandatory methods: two for air analysis, 13 for soil analysis and 57 for the analysis of water samples. An accreditation process was conducted for the Centres, with certificates valid for four years. To generate a faster response to the critical environmental situation, there are plans to purchase mobile laboratories for four regions.

Environmental compliance monitoring in the Republic of Moldova is regulated by the 2004 GD No. 862 on improving the system of specialized State control. According to this decree, competent authorities may conduct no more than one planned site inspection of a regulated entity per year. Unplanned inspections are possible in response to accidents, complaints or credible information pointing to a probable offence (follow-up visits are allowed to verify the implementation of corrective actions in response to a detected violation). Competent authorities are required to develop and publish their inspection plans.

According to the GD, the selection of regulated entities to be inspected should be based on the degree of environmental damage from non-compliance with the regulatory requirements. Article 3 of the GD defines the damage criterion as a product of multiplication of a monetary estimate of damage from a violation, which is practically impossible to calculate for an abstract offence and the facility-specific probability of non-compliance based on a historic compliance record. However, in practice, given the non-applicability of this provision, the SEI is expected to control the maximum possible number of facilities in any given year. The regulation allows for an opportunity to define prioritization criteria for inspection planning.

The demand for inspection planning is very high in the Republic of Moldova but the resources available to the SEI, in human and financial terms, are not sufficient for checking all regulated entities. For example, the Chisinau Environmental Agency, having a staff of 16 inspectors, has paper files on about 1,000 facilities registered with environmental authorities. At the same time, there are over 12,000 so-called economic agents in the city and the Agency has no database of enterprises. Inspections are planned unsystematically and their number may be inflated for reporting purposes. Chisinau Environmental Agency inspectors normally spend only about 15 per cent of their time on site visits. The

NBS has lately made an effort to produce a nationwide registry of enterprises for different sectors of government regulation. The Government has put the pressure on regulatory agencies to justify their compliance monitoring strategies.

There is no risk-based targeting of environmental inspections in the Republic of Moldova because of the lack of prioritization in compliance monitoring and of inspectors. This all results in the poor detection of environmental offences and inefficient use of regulatory resources. Inspectors often do not have objective information on environmental management practices of enterprises, including with respect to their production processes. Where the information is available, it is kept in paper files and is not well systematized. The SEI recognizes the problems and is eager to implement solutions to them.

2.8 Conclusions and recommendations

The 2005 EPR recommended the Ministry of Environment draft legislation for the introduction of an integrated permitting system. This has been fulfilled by drafting a law on environmental protection based on the principles of EU Directive 2010/75/EC (Industrial Emissions Directive). However, the law has still not been adopted. The recommendation on better use of three environmental assessment instruments (SEA, EIA and Public Environmental Expertise) and increasing public involvement in environmental decisions still needs to be implemented.

The recommendation on increasing the level of administrative fines has been implemented in practice. The level of fines is periodically raised and the relevant legislation reviewed. The total amount of fines imposed has risen 14 times during the period 2005–2012. The introduction of environmental damage assessment based on actual remediation costs still needs to be implemented.

The recommendation on improvement of compliance control has been partly implemented. During the years 2007–2010, 57 training sessions were organized in which 493 environment inspectors participated. The analytical laboratory of the Inspectorate was strengthened from a technical and methodological viewpoint. An accreditation system for analytical laboratories was established. In the field of air protection, industries were ranked according to their influence on air quality (Order of the Ministry of Environment No. 110 of 17 December 2010). However, the recommendation to assess the effectiveness of enforcement by improving the indicators which allow measuring both environmental improvements and enforcement results has not been implemented.

The environmental permitting system and the corresponding enforcement measures in the country fall short of international standards.

With important draft legislation and related secondary legislation advancing, further progress can be expected in the coming years. There is an urgent need to integrate environmental considerations into sectoral policies. The implementation of environmental requirements is underdeveloped because the environment is not considered a national priority. As the environmental permitting and inspection activities are within the same institution (SEI), there is potential for conflict of interest. Institutional reform in the permitting and enforcement area is necessary.

Recommendation 2.1:
The Ministry of Environment should reform the system of issuing permits and assuring compliance by separating the permitting and inspection functions.

The environmental permitting system does not provide for an integrated approach to pollution control and the use of best available techniques (BAT). Permit requirements are based on end-of-pipe solutions and separate permits are issued for each environmental medium. Emission standards (with the exception of urban waste water treatment plants) are not used for permitting and the dispersion or dilution calculations are the basis for setting the limits. Self-monitoring requirements are not included in the permits. The permit application process is not transparent and the issued permits are kept in paper format by the authority issuing them.

Recommendation 2.2:
The Ministry of Environment should reform the system of issuing environmental permits by:

- *(a) Introducing integrated permitting for key industries, with emission limit values set directly in the legislation;*
- *(b) Introducing best available techniques (BAT) as a basis for permitting;*
- *(c) Establishing product standards in certain areas and avoiding the use of dispersion calculation within the permitting procedure;*
- *(d) Introducing self-monitoring requirements in the permits;*

(e) *Making summaries of the applications for permits and issued permits available to the public.*

Enforcement requires capacity and expertise on the part of the Ministry of Environment and SEI in order to fully meet international standards. The regulatory system does not monitor and control the implementation of the environmental requirements in a practical and cost-effective manner and to ensure that the new legislation is implemented and enforced as intended. This may involve a substantial change of organizational culture on the part of both the Ministry of Environment and SEI.

At present, the focus is on the Ministry and SEI as "enforcers" of environmental protection regulations, rather than the European model of "managers" of environmental resources for the benefit of society. In other words, the focus is on a command-and-control approach to environmental legislation. So far, enforcement measures fall short of international standards.

Recommendation 2.3:
The Ministry of Environment should reform the compliance assurance mechanism by:

(a) *Making the level of fines for non-compliance proportional to the profit gained through violation of legislation;*
(b) *Introducing risk-based inspection planning;*
(c) *Making the environmental inspection reports of enterprises, as well as the self-monitoring environmental data submitted by them, available to the public;*
(d) *Foreseeing criminal prosecution for the violation of environmental laws and regulations.*

The implementation of international standards and practices is not fully supported by competent institutions and endorsed by increased public awareness, public participation and the credible enforcement of new legislation. While the 1996 Law No. 851-XIII on Ecological Expertise and Environmental Impact Assessment provides for public environmental expertise, this mechanism is rarely applied and does not result in desired outcomes.

Recommendation 2.4:
The Ministry of Environment should further improve the functioning of the mechanism for public participation in environmental impact assessment (EIA) by:

(a) *Establishing a detailed procedure, including a public consultation procedure, for review by the public of the EIA documentation on proposed activities;*
(b) *Ensuring that the public comments and opinions are taken into account in the decision-making process.*

Chapter 3

ECONOMIC INSTRUMENTS AND FINANCING OF ENVIRONMENTAL PROTECTION EXPENDITURE

3.1 Economic instruments for environmental protection

The system of environmentally related taxes and charges that is applied in the Republic of Moldova has not changed since 2005. Market-based instruments (such as the trading of emission permits) are not applied. A scheme for the promotion of renewable energy sources is under development. There is no legal framework yet for public sector green procurement or for eco-labelling. There is no information on the use of explicit subsidies (indicated as such in the State budget) aimed directly at the promotion of environmental protection.

The large bulk of revenues collected from the application of pollution charges (some 98 per cent in 2012) are earmarked for spending by the National Environmental Fund (NEF). The remainder is distributed among the 36 local environmental funds. The 1998 Law No. 1540-XIII on Payment for Environmental Pollution provides polluters with the possibility of offsetting investment expenditures designed to reduce pollution from pollution charges due in a given year. However, this option has not been used to a significant extent.

Pollution taxes

Tax on emissions of air pollutants from stationary sources

The system of payments for emissions of air pollutants applied in the Republic of Moldova has a large number of regulated air pollutants. The number of actually monitored substances is, however, much smaller. There are official ELVs for each pollutant, which are based on the maximum allowable concentration (MAC) of each substance.

The specific pollution tax per ton of emissions of a given substance within the established limits is defined as the product of a uniform base rate (which applies to all substances) and a risk coefficient (RC), which is specific for each substance and is designed to reflect the environmental and health risks for the population. The risk coefficient, in turn, is equivalent to the inverse of the MAC.

The lower (or higher) the value of the MAC of a given substance, the higher (or lower) is the risk coefficient, and the higher (or lower) the effective tax per ton (table 3.1). There are two different regional base rates applied in the Republic of Moldova, one for Chisinau and Balti, which is 18 lei (€1.15) per ton and the other for the rest of the country, which amounts to 14.4 lei (€0.93). Emissions above the established limits are subject to significantly higher tax rates, which may range, depending on the circumstances, from five times to 50 times the specific base tax rate.

The volume of emissions is typically estimated and not measured. The total payments to be made are mainly calculated by enterprises based on their production volumes and technological parameters. These calculations are then checked by the corresponding local environmental inspectorates. Given the very large number of targeted pollutants, the system is administratively cumbersome. There are no explicit policy objectives as regards pollution abatement. The environmental effectiveness of this instrument is also eroded by the lack of focus on major pollutants.

There have been, moreover, no significant changes in nominal pollution tax rates since 2004; however, they declined in real terms given the cumulative inflation. In general, air pollution tax rates are low; they were set without regard to marginal abatement costs and their effectiveness in creating incentives for polluters to reduce their emissions. The fact that emission tax rates have remained broadly unchanged over the past decade or so reflects, at least partly, the weak state of industry.

To illustrate, the emission tax for SO_2 is about €25 per ton compared with some €83 in Lithuania and €120 in Poland, whereas it amounts to only €10 in Romania. And a ton of emitted CO is charged at €1.2 per ton in the Republic of Moldova compared with €32 in Slovakia. But international comparisons of pollution tax rates are subject to a number of qualifications, notably differences in price levels and real incomes per capita as well as the price elasticity of the goods produced by enterprises.

Photo 3.1: Grapes around the house

Table 3.1: Tax on emissions of air pollutants from stationary sources

	Base rate per ton	Risk coefficient	Effective tax per ton	
	lei		lei	€
Pollutant	(1)	(2)	(3)	
NO_2	18.0	25.0	450.0	28.9
NOx	18.0	20.0	360.0	23.1
SO_2	18.0	22.0	396.0	25.4
Suspended solids	18.0	2.0	36.0	2.3
CO	18.0	1.0	18.0	1.2
VOCs	18.0	1.2	21.6	1.4

Source: ECE Secretariat calculations based on the 1998 Law No. 1540-XIII on Payment for Environmental Pollution (as amended).
Note: The emission charge per ton (col. 3) is the product of col. (1) and col. (2).
The risk coefficient is equivalent to the ratio 1/MAC.
Exchange rate: €1 = 15.56 lei (average annual exchange rate in 2012).

There has been no assessment made by the Ministry of Environment of the environmental effectiveness of this tax, which is just regarded as an instrument for generating revenues for the environmental funds.

Payments for emissions of air pollutants from mobile sources

The 1998 Law No. 1540-XIII on Payment for Environmental Pollution (as amended) distinguishes two types of charges under this heading. The first is a tax on imported motor fuels, which covers fuels for both road motor vehicles and aircraft. The tax base is the customs value of the imported fuels (ad valorem tax). This means that the tax base is not pollution oriented because it fluctuates more or less in line with changes in world market prices of these products. The tax rate applied is 0.5 per cent for unleaded gasoline and 1 per cent for leaded gasoline, aviation fuel (kerosene) and diesel fuel. In contrast, the Law also established (as from 2005) an excise to be paid for the use of motor vehicles using liquefied petroleum gas (LPG) or compressed natural gas.

The tax base is the actual volume (in tons) of fuel consumed. The tax rate is 0.9 lei (€0.06) per ton

(1000 m^3) of LPG fuel and 0.75 lei (€0.05) per ton of compressed natural gas fuel. In this case, the tax base is pollution oriented, but the tax is only applied to vehicles used by enterprises for business purposes.

The second tax established by the Law under this category is a levy on foreign-registered road motor vehicles, which is collected at the State border by customs services. The tax base for passenger motor cars is the number of passenger seats and the vehicle reference mass (in tons). For trucks, the tax base is the load weight. This tax is also not pollution oriented but, rather, corresponds to a road user fee. The tax rate varies, depending on the vehicle category, from 35 lei (€2.25) to 90 lei (€5.80).

All the above-mentioned tax rates have not been changed since their introduction.

Tax on discharge of water pollutants into surface water bodies

The basic principles and procedures for the application of the tax on the discharge of water pollutants into surface water bodies (effluent taxes) are similar to those applied to emissions of air pollutants from stationary sources. The tax base is the volume of polluted water discharged, and the discharge of pollutants to be paid for is calculated based on standard production parameters. MAC values have been established for some 240 chemical substances, which are, as in the case of the number of regulated air pollutants from stationary sources, extremely large. For comparison, EU Directive 75/440/EC on surface waters suitable for drinking water abstraction indicates only 46 parameters.[1]

As from 2008, the effluent tax scheme was simplified by abolishing the different tax rates per ton established for each of the 30 or so regional territorial administrative units. As is the case for air pollution from stationary sources, there are now two base rates per ton, one for Chisinau and Balti (234 lei corresponding to some €15) and one for the other regions (198 lei or €12.70). The rate applied in Chisinau and Balti was raised by 5 lei (€0.30) in 2011 but that for the other regions remained unchanged. The specific charge rates per ton of effluents discharged depend on the value of the risk coefficient, i.e. the MAC (table 3.2). As is the case with emissions of air pollutants from stationary sources, there has not been an assessment of the impact of these effluent charges on the behaviour of polluters.

Pollution charge on waste storage and disposal

Enterprises have to pay a tax for storing production waste on their premises or for placing waste in other authorized locations (e.g. landfills). The tax rate per ton depends on the toxicity class of the waste (table 3.3) Waste that was accumulated before 1999 is not subject to payment. Waste accumulated above the established maximum volume is subject to payment of a fine that corresponds to five times the normal payment per ton. The system encourages enterprises to store waste on-site given that charges for toxic waste categories correspond to only 30 per cent of charges for waste disposed of at landfills. The corresponding charges for non-toxic waste correspond to only some 2 per cent of the payments for disposal outside company premises. Alternatively, this may also create incentives for illegal dumping, depending on the stringency of waste management regulation and its enforcement.

Charges on imported products that are contaminating the environment

Article 11 of Law No. 1540-XIII also establishes a product charge on a large range of imported goods that can have environmentally harmful effects. The types of products that are subject to these charges are specified in annex 8 to the Law. The charge base is the customs value of the product and the charge rate varies between 0.5 per cent and 5 per cent of the customs value. This is another case of a "pollution charge" that has a charge base that is not pollution oriented. (To illustrate, for a given volume of imported products, falling prices lead to lower tax payments, independently of the environmental impact.)

The 2008 Law No. 173-XVI amended article 11 of Law No. 1540-XIII by introducing separate charges for import of plastic packaging and tetra-pak packaging that contains products (except dairy products). The rate varies with the storage capacity (in litres) of the plastic container or the tetra-pak packaging. It ranges from 0.80 lei (€0.05) to 3 lei (€0.20). The revenues are collected by the customs services and are earmarked for the NEF. The funds are mainly to be used for financing the costs of collecting, sorting and processing of waste generated, as well as for measures designed to improve air quality.

[1] Council Directive 75/440/EEC of 16 June 1975 concerning the quality required of surface water intended for the abstraction of drinking water in the Member States.

Table 3.2: Examples of taxes on the discharge of polluted water into surface water bodies

Pollution parameters	Base rate per ton lei	Risk coefficient	Effective tax per ton	
			lei	€
	(1)	(2)	(3)	
BOD	234.0	0.3	77.2	5.0
COD	234.0	1.0	234.0	15.0
Nitrates	234.0	0.1	23.4	1.5
Phosphate	234.0	5.0	1,170.0	75.2
Detergents	234.0	10.0	2,340.0	150.4
Lead	234.0	10.0	2,340.0	150.4

Source: ECE Secretariat calculations based on 1998 Law No. 1540-XIII on Payment for Environmental Pollution (as amended).
Note: The emission charge per ton (col. 3) is the product of col. (1) and col. (2).
The risk coefficient is equivalent to the inverse of the value of the MAC of the pollutant. The charge rates shown apply to Chisinau and Balti. Exchange rate: €1 = 15.56 lei (average annual exchange rate in 2012).

Table 3.3: Tax on the storage of production waste

	Location of waste storage			
	Company premises		Outside company premises	
Waste category	lei/ton	€/ton	lei/ton	€/ton
Toxicity class 1	104.4	6.7	360.0	23.1
Toxicity class 2	32.4	2.1	108.0	6.9
Toxicity class 3	10.8	0.7	36.0	2.3
Toxicity class 4	5.4	0.3	18.0	1.2
Non-toxic waste	0.018	0.001	1.1	0.1

Source: ECE Secretariat calculations based on the 1998 Law No. 1540-XIII on Payment for Environmental Pollution (as amended).
Note: Exchange rate: €1 = 15.56 lei (average annual exchange rate in 2012).

These new taxes on plastic and tetra-pak packaging containing products, however, have led Ukraine to request consultations with the Republic of Moldova within the framework of the World Trade Organization (WTO), arguing that this tax violates GATT rules pertaining to national treatment (arts. III:I, III:2 and III:4 of the GATT 1994) because: (i) similar domestic Moldovan products deemed to be environmentally harmful are not subject to a similar tax; and (ii) packages containing domestic products are not subject to the new tax. The complaint to the WTO Dispute Settlement Body (DSB) was submitted on 17 February 2011. At its meeting on 17 June 2011, the DSB established a panel to examine the case. At the time of writing there is no further information on this matter.

Other environmentally related taxes

Excises on energy products

The Republic of Moldova applies excise duties on a range of petroleum products. A new excise on LPG was introduced as from the beginning of 2012. These are specific taxes that are defined per ton (or litre) of the corresponding product. (It should be noted that these excises on motor fuels – petrol, diesel and LPG – are levied in addition to the above-mentioned "pollution tax" on motor fuels, including LPG.) Excise rates on energy products have markedly increased during recent years. Thus, the excise on petrol and diesel per ton rose by some 167 per cent in 2013 compared with 2008 (table 3.4).

This reflects the growing pressures on fiscal policy to generate higher revenues for the State budget and to ensure that excises on energy products progressively approach the corresponding EU minimum rates. Effective from the beginning of 2013, excise duties on a wide range of energy products (including motor fuels) are indexed on the expected growth of annual nominal GDP, which implies an increase in excise rates by some 7 per cent compared with the last applied rates in 2012.

Excises on motor fuels are still quite low compared with EU minimum rates, which are expressed in terms of euros per 1000 litres. Given their different densities, 1 ton of petrol corresponds to some 1,300 litres and 1 ton of diesel is equivalent to about 1,180 litres. This means that the excise on petrol effective as from the beginning of 2013 (3,200 lei per ton) amounts to 2,462 lei per 1,000 litres, equivalent to some €158.20 per 1,000 litres (using the average exchange rate of 2012). This corresponds to about 45 per cent of the EU minimum rate of €359. For diesel, the excise at the beginning of 2013 amounts to 1,227 lei (€2.50) per 1,000 litres, which corresponds to some 22 per cent of the EU minimum rate of €330.

These minimum rates are currently applied by Bulgaria and Romania. Total revenues from the excise on petrol and diesel amounted to 981 million lei (€63 million), up from 406 million lei in 2006.

Table 3.4: Excises on selected energy products

	2008	2013	2013
Product	lei/ton		€/ton
Benzene, Toluene, Xylene*	1,200	3,200	205.66
Petrol, aviation fuel	1,200	3,200	205.66
Diesel	500	1,330	85.48
Natural gas condensate	1,200	3,200	205.66
LPG	0	1,995	128.20

Sources: Ministry of Finance, Taxation in the Republic of Moldova, 2008; Tax Code of the Republic of Moldova.
Note: * for use as power or heating fuel.
Exchange rate: €1 = 15.56 lei (average annual exchange rate in 2012).

Most of the motor fuels are imported from Romania. There are no subsidies for motor fuels. Retail sales prices largely reflect the development of the world market prices of crude oil and in the exchange rate of the national currency. But the prices of motor fuels have also been influenced by the sizeable increases in excise duties on motor fuels. In early March 2013, the price of petrol (Euro95) in the Republic of Moldova was 17.64 lei (€1.103) per litre; the price for diesel was 17.09 lei (€1.068). The corresponding prices in Romania were €1.362 (petrol) and €1.374 (diesel). The lower prices (some 20 per cent) in the Republic of Moldova are entirely on account of the lower tax burden (excises, environmentally related taxes and VAT), assuming that the retail margin is the same in both countries.

Excise duties on imported road motor vehicles

There is an excise tax (in euros) on imported road motor vehicles (excluding trucks and tractors), which varies with the engine size (table 3.5); in addition, there is a surcharge for vehicles with an age of three years or more, which is proportional to the age of the car. The seven-year age limit for imported cars to be accepted for registration in the Republic of Moldova has been raised to 10 years as from the beginning of 2013.

The tax has been streamlined as from 2013 by reducing the number of engine size categories. Up to 2012, cars older than three years and up to the maximum allowed age of seven years were subject to an additional tax per cm^3 which increases with the age of the vehicle.

Effective from 2013, this *surcharge* has been extended to the import of vehicles with an age up to 10 years. To illustrate, for a vehicle with a cylinder capacity within the range of 1,500 to 2,000 cm^3 and with an age up to seven years, the excise rate is €0.77 per cm^3. The corresponding excise amounts to €0.81 per cm^3 for a car that is eight years old and €0.89 per cm^3 for a 10-year-old car. There is, moreover, a customs legalization fee for all imported cars, which corresponds to 0.4 per cent of the customs value. Total revenues from this tax amounted to 634 million lei (€40.8 million) in 2011.

Road-transport-related taxes

Annual registration tax

This is an annual tax to be paid by owners of motor vehicles registered in the Republic of Moldova. (Tractors and trailers used in agriculture as well as electric vehicles are exempt from the tax.) The tax depends on the type of vehicle and its technical characteristics, i.e. the engine capacity (cm^3), the load capacity (tons) for trucks and, and, for buses, the number of seats. Registration fees were raised significantly as from January 2013 compared with the fees that were applied since the beginning of 2010 (table 3.6). For vehicles for which the tax base is the engine size, the tax is now applied per cm^3 for a given range of engine size.

The former system applied a uniform tax rate for defined ranges of engine size. In the event, there has been a significant increase in car registration taxes. To illustrate, as from January 2013 a passenger motor car with an engine capacity between 4,001 and 5,000 cm^3 is subject to a tax rate of 1 leu (€0.06) per cm^3; the maximum payment is therefore 5,000 lei (€321). Under the old system, there was a flat tax of 2,100 lei (€135) for a vehicle with an engine capacity ranging from 4,001 to 4,500 cm^3, and 2,400 lei (€154.20) for an engine within the range of 4,501 to 5,000 cm^3.

Table 3.5: Excise duties on imports of motor vehicles, €

CN Code	Cylinder capacity (ccm)	Excise rate (€ per ccm) 2008	2013
	Vehicles with gasoline engine		
870321	Up to 1,000	0.30	0.38
870322	more than 1,000 up to 1,500	0.40	0.50
870322	more than 1,500 up to 2,000	0.60	0.77
870323	more than 2,000 up to 3,000	1.00	1.27
870324	more than 3,000	1.60	3.50
	Vehicles with diesel engine		
870331	up to 1,500	0.40	0.50
870332	more than 1,500 up to 2,500	1.00	1.27
870333	more than 2,500	1.60	3.50

Sources: Ministry of Finance, Taxation in the Republic of Moldova, 2008; Fiscal Code of the Republic of Moldova.
Note: The excise rates are increased with the age of the motor vehicle. The rates shown for 2013 apply to vehicles with an age of up to seven years.
Since 2012, the maximum allowed age is 10 years; before that date, the maximum age was seven years.
Imports of "old-timers" are subject to a fee of €10,000.
CN = Combined Nomenclature

Table 3.6: Tax on domestically registered motor vehicles

Vehicle type	Tax base	Tax rate 2013	Maximum tax 2010	2013
		lei	lei	lei
Motor cycles				
up to 500 cm^3	Unit	200	100	200
above 500 cm^3	Unit	400	100	400
Passenger motor cars				
up to 2,000 cm^3	cm^3	0.4	250	800
2,001 up to 3,000 cm^3	cm^3	0.6	900	1,800
3,001 up to 4,000 cm^3	cm^3	0.8	1,500	3,200
4,001 up to 5,000 cm^3	cm^3	1.0	2,100	5,000
more than 5,000 cm^3	cm^3	1.2	3,000 (1)	7,200 (1)
Trucks, vans with total weight				
up to 1.6 tons	Unit	800	300	800
more than 1.6 up to 5 tons	Unit	1,500	500	1,500
more than 5 up to 10 tons	Unit	2,000	700	2,000
more than 10 tons	Unit	3,000	1,000	3,000
Buses				
up to 11 seats	Unit	1,950	1,000	1,950
12 to 17 seats	Unit	2,400	1,200	2,400
18 to 24 seats	Unit	2,850	1,400	2,850
25 to 40 seats	Unit	3,150	1,600	3,150
more than 40 seats	Unit	3,600	1,800	3,600

Source: Ministry of Transport and Roads Infrastructure.
Note: Tax rates effective 11 January 2013.
(1) Indicative tax for vehicle with 6,001 cm^3 engine.

This corresponds to a doubling of the registration tax. Effective from January 2013, there have also been substantial increases in registration taxes for all other types of vehicles registered in the Republic of Moldova. Total revenues from this tax, which are earmarked for the National Road Fund, amounted to 155 million lei (some €100 million) in 2011, up from 58 million lei in 2006.

Tax on foreign-registered motor vehicles

This is a tax that is applied to motor vehicles with foreign registration that enter the country for a certain period of time and/or are transiting through the country. The tax, which is set in euros, is collected at border customs posts. It is composed of an entry charge and a transit charge. Vehicles transporting

dangerous goods have to pay twice the standard rate. The tax applies only to buses, trucks and trailers. The tax for buses depends on the number of seats. The tax for trucks depends on the total weight (without exceeding the allowed maximum weight). This tax is collected in addition to the "pollution tax" on foreign-registered vehicles mentioned above.

A new law adopted by the parliament in December 2012 introduced a road tax (called "vigneta") also for personal motor vehicles registered abroad. It became effective in January 2013. The tax base is the number of days the vehicle stays in the country. The tax rate ranges from €4 for stays up to seven days to €50 for a stay of more than 180 days. Non-payment is subject to fines, which can range from 2,000 lei (€128.50) to 4,000 lei (€257). This change in legislation will also affect the many Moldovans who have foreign-registered vehicles and stay for a longer period in their home country. This tax can be expected to generate considerable additional revenues for the State budget. Earlier estimates based on half the adopted tax rates forecast revenues of some 25 million lei (€16 million).

Tax applied to vehicles with characteristics exceeding permissible limits

This tax is applied to vehicles (mainly trucks) the characteristics of which (gross vehicle mass, axle weight and dimensions – height, width, and length) exceed permissible limits. The tax rate varies with the extent to which the allowed maximums are exceeded. In addition, the total tax payment depends on the distance that the vehicle will be travelling in the country. The tax is applied to both domestic and foreign-registered vehicles. These tax rates have also been significantly increased, effective from 2013. Revenues collected are earmarked for the National Road Fund.

Other transport-related taxes

There are two local taxes related to the use of motor vehicles. One is a tax for providing passenger transportation services in urban and rural areas. The tax base is the number of seats in the vehicle. The other tax is a parking tax, which has to be paid by legal entities that provide car parking-space services. Since 2009, the tax base for calculating the parking tax is the size of the total parking area. The current maximum annual levy, established in the Tax Code, is 6 lei (some €0.40) per m^2. This is also the rate that is applied in Chisinau, the capital. Before 2009, the tax rate was 10 per cent of the annual revenues from this activity.

Revenues from environmentally related taxes and charges

The revenues collected from the taxes and charges established in the 1998 Law on Payments for Environmental Pollution are earmarked for the National Environmental Fund (NEF) and the 36 local environmental funds. Only the revenues from the small tax on imported natural gas and LPG used by motor vehicles (owned by enterprises) are not allocated to the environmental funds but, rather, are transferred to the general State treasury. The revenues from the tax on mobile emission sources as well as the levy on imported environmentally harmful products, which are by far the dominant sources of revenues, are fully allocated to the NEF.

The NEF also obtains all the revenues from compensation payments for damage done to fish stocks in lakes and rivers, as well as the fees for certification of exports and imports of flora and fauna species within the framework of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). But there is no information on the corresponding revenues collected, which appear, however, to be very small. The revenues from the tax on emissions of air pollutants from stationary sources and water effluent charges, as well as waste storage payments and fines, are shared between the NEF (30 per cent) and the 36 local environmental funds (70 per cent).

Total revenues of the NEF amounted to some 236 million lei (€15.2 million) in 2012, up from 57.5 million lei in 2007 (table 3.7). In contrast, aggregate revenues of the local funds amounted to only 5.6 million lei (€ 0.36 million) in 2012, with no clear tendency since 2007. In the event, the NEF accounted for 97.7 per cent of total earmarked revenues in 2012. The revenues of the NEF accounted for 0.7 per cent of total general government revenue in 2012, corresponding to 0.3 per cent of GDP.

The strong growth in NEF revenues is almost entirely on account of the introduction of the levy on imported plastic and tetra-pak packaging in 2008, which is part of the levies on imported environmentally harmful goods. During 2011–2012, the levy on imported environmentally harmful products accounted, on average, for 86.5 per cent of total earmarked revenues for the NEF. The fuel tax on mobile emission sources accounted for another 12 per cent; the remaining 1.5 per cent derived from the shared revenues from payments for air pollution from stationary sources, water pollution, waste storage and fines.

Table 3.7: Total revenues from earmarked taxes for the environmental funds

Source/Distribution	2007	2008	2009	2010	2011	2012
Air pollution, stationary sources (million lei)	2.95	2.95	2.94	2.99	3.26	2.80
Air pollution, mobile sources (million lei)	37.16	43.42	14.58	19.06	29.41	28.23
of which:						
a) Tax on imported motor fuels (million lei)	36.86	42.97	13.90	18.27	28.42	27.73
b) Tax on foreign-registered road motor vehicles (million lei)	0.30	0.45	0.68	0.79	0.99	0.50
Water pollution (million lei)	2.51	3.16	2.76	3.26	3.85	2.80
Waste storage (million lei)	0.95	1.10	0.98	0.82	1.21	0.76
Levy on imported environmentally harmful products (million lei)	18.51	98.72	176.00	182.32	202.03	204.76
Fines (million lei)	0.77	1.04	0.86	0.80	1.95	1.87
Total above	**62.85**	**150.39**	**198.12**	**209.24**	**241.70**	**241.22**
of which:						
National Environmental Fund (million lei)	57.45	144.22	192.01	202.69	234.81	235.63
Local environmental funds (million lei)	5.40	6.17	6.12	6.56	6.89	5.58
Total above (€ million)	4.04	9.67	12.73	13.45	15.53	15.50
Total above (as per cent of total general government revenue)	0.28	0.59	0.84	0.76	0.80	0.71
Total above (as per cent of GDP)	0.12	0.24	0.33	0.29	0.29	0.27

Source: Ministry of Environment (direct communication); ECE Secretariat calculations.
Note: Figures in euros were calculated on: €1= 15.56 lei (average annual exchange rate in 2012).

Revenues from collection of motor-fuel- and road-transport-related taxes

Revenues from collection of road-transport-related taxes established in the Tax Code have been on a rising trend in recent years. This reflects the combined effects of an increase in the number of vehicles, higher tax rates and more strict application of tax imposition rules. In the event, aggregate tax revenues amounted to 1.8 billion lei (€116 million) in 2011, corresponding to 2.2 per cent of GDP. This is an increase of more than 100 per cent compared with 2006 (table 3.8).

Adding the revenues from payments of pollution charges (see above) to these revenues provides a rough approximation of environmentally related tax revenues in the Republic of Moldova. In 2011, the aggregate revenues corresponded to some 2.5 per cent of GDP, which is broadly the same as the EU average for 2010.

Natural resource use charges

Natural resource charges are local taxes that are regulated by the Tax Code (arts. 299-334 and annexes 1-3). They comprise a water abstraction charge; payments related to mineral resources prospecting, exploration and extraction; and charges for forest wood cutting.

Water abstraction charges

The charge is to be paid by enterprises (natural or legal persons) that are engaged in the abstraction of water from the national water fund. The tax base is the volume of water abstracted. The current standard water abstraction charge rate is 0.3 lei (€0.02) per m^3, which also applies to water to be used for irrigation in agriculture. In 2008, this charge rate still amounted to 1 lei (€0.06) per m^3. The existing small hydropower plant can abstract water at a rate of 6 lei (€0.39) per 1,000 m^3; this rate is the same as applied in 2008. The fee for the abstraction of mineral water and any kind of bottled water amounts to 16 lei (€1.0) per m^3.

Taxation of mineral resources

The Agency for Geology and Mineral Resources (AGMR) is responsible for the protection and rational use and development of underground resources (including water). The Agency is subordinated to the Ministry of Environment. There is a tax on geological prospecting (i.e. the search for mineral deposits), which amounts to 2 per cent of the contractual estimated value of the work involved. At the next stage, there is a tax on geological exploration (i.e. determining the size and other characteristics of the deposit), which amounts to 5 per cent of the contract value. This tax rate was only 2 per cent in 2008. The extraction of mineral resources is subject to a royalty, which is a fixed percentage of the assessed value of extracted minerals. The royalty ranges from 6 to 20 per cent, depending on the type of minerals.

Fee for use of underground spaces

There is a fee to be paid for the use of underground spaces for the construction of underground structures that are related to the extraction of useful minerals.

Table 3.8: Revenues from road-transport-related taxes

Type of tax	2006	2007	2008	2009	2010	2011
Excise on imports of passenger cars (million lei)	301.0	470.0	598.0	446.0	391.0	634.0
Excise on petrol and diesel (million lei)	406.0	431.0	458.0	664.0	907.0	981.0
Road tax on vehicles registered in Moldova (million lei)	58.0	69.0	82.0	90.0	145.0	155.0
Parking tax (million lei)	2.6	2.7	3.3	3.3	3.5	3.4
Tax for provision of transportation services (million lei)	20.0	17.0	18.0	20.0	21.0	25.0
Total above	**787.6**	**989.7**	**1,159.3**	**1,223.3**	**1,467.5**	**1,798.4**
Total above (€ million)	50.6	63.6	74.5	78.6	94.3	115.6
Total (as per cent of GDP)	1.8	1.9	1.8	2.0	2.0	2.2

Source: Ministry of Finance.
Note: Exchange rate: €1 = 15.56 lei (average annual exchange rate in 2012).

The fee is 3 per cent of the contractual (estimated) value of the works. Payment is due before the corresponding works commence. Another fee is due for the exploitation of underground structures that are not related to mineral extraction; it corresponds to 0.2 per cent of the book value of the underground facility.

Tax on timber

There is a tax on the cutting of standing timber; the tax rate depends on the type of wood and its usage, i.e. wood used as raw material in industrial processing or as fuel wood. The fees for wood used as raw material input depend on both the type of tree and its height. The fees for high trees range from 9 lei (€0.60) per m^3 for softwood to 52 lei (€3.30) per m^3 for walnut. The average charge rate for fuel wood is 2 lei (€0.12) per m^3. The collection of fuel wood (used for heating and cooking) by the population is quite common in rural areas. This requires a special permit from the local forest authorities as well as advance payment. But illegal logging appears to be quite common.

Tariffs for communal services and energy supply

Communal services (water supply and sewerage, solid waste management) are operated by the special public service companies that are subordinated to local governments, which also determine tariff setting. In contrast, tariffs for energy supply (electricity, gas, thermal energy) are regulated by the National Energy Regulatory Agency (ANRE). It is noteworthy that the supply of water, heat and hot water to private households is exempt from VAT, which is tantamount to an explicit subsidy. The standard VAT rate is 20 per cent; however, a range of products (such as bread and dairy products but also natural gas and LPG) benefited from a reduced rate of either 6 per cent or 8 per cent up to the end of 2012. As from 2013, these two categories were consolidated into a single category with a reduced rate of 8 per cent, which is still tantamount to a sizeable subsidy.

Municipal waste management fees

The fees for waste collection and disposal/dumping are determined by municipal councils. The standard is for households living in apartment blocks to pay a fixed fee per person per month. Households living in individual houses in some towns (e.g. Chisinau) have to pay a fee per m^3 of waste. The use of a volumetric fee (per m^3) is more frequent in the case of municipal waste from commerce, industry and other sources.

Available data suggest that the current waste fees are quite low across the country, ranging from some 3 lei (€0.20) to 12 lei (€0.75) per person per month for private households. Discounts may be offered for pensioners and for children up to a certain age. In Chisinau, the standard fee is 7 lei (€0.45) per month for persons living in apartment blocks. Persons living in individual houses pay 46 lei (€2.95) per m^3. Fees for enterprises are within a range of 40 lei (€2.60) to 114 lei (€7.30) per month across the towns. Volumetric fees range from 69 lei (€4.40) to 150 lei (€9.65).

In Chisinau, the local waste company ("I. M. Regia Autosalubritate") charges enterprises 75 lei (€4.50) per m^3. Revenues appear, in many cases, sufficient to cover operating costs – but this reflects the overall low waste management standards, notably the absence of proper landfills. In Chisinau, waste collection fees have not been modified since 2008, and the waste operator is now only barely able to cover basic operating costs.

The challenge ahead is the financing of the planned and urgently needed significant technological upgrading of the national waste management sector. To illustrate, the Strategy for Integrated Solid Waste Management for the Southern Development Region,

which is being implemented within the framework of the project Waste Governance – European Neighbourhood and Partnership Instrument (ENPI) East, has estimated financing costs in the region of €150 million up to 2021. While at the initial stage there will be grants and loans available from international donors, a necessary condition for the successful implementation of the Strategy is to ensure the financial sustainability of waste companies. This, in turn, requires the gradual raising of waste fees to levels that allow full cost recovery, subject to the constraint of ensuring the affordability of waste services for the vulnerable segments of society.

Water supply and sewerage tariffs

Water supply and sewerage services are part of the public utility services that have been assigned to the local governments, which, in turn, have transferred this task to separate water companies. These are functioning as autonomous units subject to the overall management authority of the various local public administrations. In order to improve water services quality on a financially sustainable basis, notably in rural areas, the Government has, since 2010, been supporting a policy of regionalization of water supply and sewerage services based on the financial and managerial cooperation of municipalities and the merging of water companies. There is as yet little involvement of the private sector in the water sector, which the Government aims to promote, however, through public–private partnerships (PPPs).

Water supply and sewerage tariffs are set by each of the municipal councils. In principle, tariff setting has to follow a methodology established by ANRE, designed to ensure full cost recovery (2004 GD No. 164 on the methodology for the establishment of water supply and sanitation tariffs). But the dominant feature has been for tariff setting to be strongly influenced by local political considerations. This, in turn, has entailed that average tariffs are, in general, significantly lower than the tariffs that would result from the application of the ANRE methodology. In other words, the applied tariffs do not allow water companies to achieve cost recovery. As a result, the operations of nearly all water companies are not financially sustainable. In order to take tariff setting out of the local political process, a new draft law on water supply and sanitation stipulates that the responsibility for tariff setting be shifted to ANRE.

The tariff schedule for drinking water and sanitation distinguishes between two consumer categories: private households and other consumers (industry, commerce, etc.). Tariffs differ, on occasion significantly, among the towns, but a consistent pattern is that tariffs for the group of other consumers are significantly higher than those for private households (table 3.9). In other words, private households benefit from significant cross-subsidies. There have been, however, significant increases in water tariffs in recent years. On average, as measured by the corresponding component of the official consumer price index (CPI), tariffs for household water supply and sewerage rose by some 220 per cent in 2012 compared with 2006 (table 3.10). This is more than four times the increase in the total CPI by 53 – not sufficient to offset the increase in water companies' production costs, notably energy and costs of maintenance and repair. The politicization of tariffs is most conspicuous in the case of hot water supply, given that these tariffs were kept stable between 2006 and 2011, and were even reduced by 18.4 per cent in 2012. This is tantamount to substantial implicit subsidies, which amount to the difference between actual revenues of the utility and the revenues that it would receive if full cost recovery tariffs were applied. Tariffs for hot water are, moreover, exempt from VAT (however, this is not an implicit subsidy as it does not affect the revenues of the utility.)

Table 3.9: Selected municipal water supply and sewerage tariffs

	Households (lei per m^3)		Other consumers (lei per m^3)	
Town	Water	Sewerage	Water	Sewerage
Chisinau	8.06	1.13	12.70	10.26
Balti	11.08	3.90	23.64	17.01
Ceadir-Lunga	14.00	13.50	40.00	30.00
Comrat	13.00	12.55	33.00	30.83
Floresti	14.49	4.41	27.56	30.24
Hincesti	11.84	6.25	40.79	22.05
Leova	11.60	8.50	28.78	26.09
Orhei	12.00	3.00	21.00	28.00
Soroca	10.90	1.60	35.20	16.60
Stefan Voda	15.00	10.00	48.74	24.50
Arithmetic average of above	12.20	6.48	31.14	23.56
Arithmetic average of above (€/m^3)	0.78	0.42	2.00	1.51

Source: Association "Moldova Apa-Canal", 2013.
Note: Arithmetic average of tariffs is an unweighted average.
Tariffs in force on 20 April 2012. Excludes VAT.

During recent years, the installation of individual water meters has increased significantly. Practically all connected water users (96 per cent) are now having their consumption measured by individual meters. The average bill collection rate is 82 per cent,

pointing to problems in enforcing payment of water bills. There appear, however, to be serious problems – notably in Chisinau – with the quality of meters installed in the past, which are seen to lead to a systematic under-recording of cold and hot water consumption, which, in turn, entails significant losses for the Chisinau water company and the local district heating company (Termocom).

Given the poor social conditions overall in the country, the affordability of adequate water services for low-income households is an issue that has been looming large, given the continuing upward pressures on tariffs that will be associated with the need to finance the costs of the rehabilitation and extension of the water sector infrastructure as well as the cost pressures emanating from increasing staff and energy costs. While, in the past, the provision of subsidies for households that could not afford the going tariff was decided by the local authorities, there may now be a larger role for the newly designed targeted social assistance scheme launched by the Government.

Tariffs for energy supply

The Energy Strategy of the Republic of Moldova until 2020 (2007 GD No. 958) has as key goals the mobilization of the investments required for improving the efficiency, reliability and overall competitiveness of the domestic energy sector. This will require also having energy tariffs that are cost reflective so that operations of energy companies are financially sustainable and attractive for new investors. The Government has also still to fully deal with the legacy of large inter-company debt accumulated by State-owned energy companies on account of unpaid energy bills from suppliers, mainly Moldovagaz, the national domestic gas supplier.

At the local level, this concerns mainly the Chisinau district heating company (Termocom), which accumulated large arrears of unpaid gas supply bills because of its huge financial losses stemming from a long period of heating tariffs that were not cost reflective.

Energy tariffs are regulated by ANRE. The tariff methodology is based on a cost-plus model, using actual data for production costs and taking into account the need for an adequate rate of return in order to ensure that tariffs are cost reflective. Up to 2009, ANRE determined only the electricity and gas tariffs. In contrast, it calculated appropriate heat tariffs at cost-recovery level, but the actual tariffs paid to the (public) utilities were set by municipal councils. This meant that setting of heat tariffs was dominated by political considerations, which led to tariffs far below cost-recovery levels. Against the background of accumulating losses of heat companies, the 2009 Law No. 170 on Amending and Supplementing Some Laws has therefore transferred the responsibility for heat tariff setting from the municipal authorities to the national energy regulator.

Average end-user tariffs rose from 0.75 lei per kWh in 2005 to 1.53 lei (€0.98) in 2012; this was a period during which tariffs progressively approached the level tantamount to cost recovery, which has now been attained. Besides the changes in domestic input costs, tariff developments have been largely reflecting the prices of imported energy resources as well as the foreign exchange rate.

The regulated domestic gas prices are heavily influenced by the dollar price of gas purchased from the Russian Federation, which is based on a specific long-term agreement on a price-setting formula, which takes into account, notably, the world market price of crude oil. Against the background of a rising trend for import prices of natural gas, the feature has been for regular upward revisions of domestic gas tariffs. Between 2005 and 2012, gas import prices rose from US$80/1,000 m^3 to some US$400/1,000 m^3, which corresponds broadly to the average western European import price of gas from the Russian Federation. The sharp rise in gas import prices has driven up domestic costs not only of electricity production but also of heat production, which is mainly operated by gas-fired Combined Heat and Power (CHP) companies. Centralized district heating systems are operated in Chisinau, Balti and some other towns. The district heating in the capital, Chisinau, is operated by the municipality-owned JSC Termocom.

In the event, the rise in domestic gas and heating tariffs in recent years has been considerable. Thus, private households experienced an increase in gas tariffs of 186 per cent in 2012 compared with 2006; central heating tariffs rose by some 245 per cent over the same period (table 3.10). These are considerable increases also in real terms, taking into account the average increase in consumer prices by “only” 53 per cent during 2006–2012.

More generally, electricity, gas and heat tariffs can now be considered to be cost reflective. Most of the cross-subsidies to households from non-household entities have been eliminated, with the main exception of the heating sector. In Chisinau, the municipality still covers 40 per cent of the heating bills for households with monthly incomes up to 1,350 lei (some €87).

Table 3.10: Consumer price indices for communal services

	2006	2007	2008	2009	2010	2011	2012
Electricity	100	112.7	141.4	151.3	181.8	196.3	211.4
Gas	100	138.6	160.5	174.3	193.5	242.8	285.8
Central heating	100	103.7	124.3	192.3	230.6	307.0	343.8
Hot water supply	100	100.0	100.0	100.0	100.1	100.1	81.6
Water supply and sewerage	100	121.8	186.8	241.8	271.5	284.5	320.7
Total CPI	100	112.3	126.6	126.6	136.0	146.3	153.0

Source: National Bureau of Statistics.
ECE Secretariat calculations.
Note: Baseline = 2006.

The bill collection rate for electricity and gas has gone up to very high levels (more than 95 per cent), reflecting stricter payment discipline enforced by energy distribution companies. But there appear still to be frequent problems with the payment of monthly heating bills, even though non-payment of bills leads to disconnection from the network, and reconnection to the grid requires payment for unpaid consumption and an additional fee for reconnection.

Given the steep rise in energy tariffs, affordability of adequate energy supply remains a major challenge for low-income households. This pertains notably to people in urban areas, who cannot easily use fuel wood as a substitute for cooking and heating. ANRE established a social electricity tariff for low-income customers, but it applied to the customers of the State-owned electricity distribution companies only. The monthly maximum consumption level has to be lower than 50 kWh, which excludes most low-income customers from the social tariff. In the event, the tariff was abolished as from August 2008. The Government has undertaken a major reform of social assistance schemes, which were badly targeted on poor households. The old scheme has been gradually replaced by a targeted, means-tested assistance scheme since 2012.

3.2 Environmental protection expenditures and their financing

Addressing the various major environmental problems (such as the modernization and extension of solid waste management systems, and soil conservation) requires considerable financial resources. To illustrate, the National Waste Management Strategy for the period 2013–2027 (chapter 8) estimates the costs for upgrading the current waste management system to be within a range of €293 million to €476 million, depending on the available options chosen. This corresponds to some €20 million to €32 million per annum. The investment needs in the water supply and sanitation sector are also considerable. The financing of the Government's 2007 Strategy of Water Supply and Sanitation of Communities (Water Strategy), to rehabilitate, modernize and extend the water supply and sanitation sector, is estimated to be within a range of €1.2 billion to €3.2 billion over a period of 20 years. The lower boundary of this range would be just sufficient to arrest the process of progressive deterioration of the existing water sector infrastructure in urban areas. To date, investments in the waste and water sector have been predominantly financed by foreign assistance. But the future flow of foreign assistance is uncertain and cannot, in any case, be expected to cover most of the future investment bill. It is, therefore, important to mobilize sufficient domestic public and private resources and to get the priorities right in public sector medium-term expenditure strategies. More generally, the challenge for the Government is to create the necessary "fiscal space" for the modernization of the country's infrastructure. The overall planning of government expenditures is done within the framework of the medium-term expenditure framework (MTEF) that was introduced in 2003. The MTEF aims at setting fiscal targets and allocating resources in such a way that they reflect the general development and sectoral priorities within the limits set by the established fiscal targets.

Domestic public financing institutions and resources

All public expenditures on environmental protection are included in the State budget, which also includes funds provided by foreign donors. Until 2012, this was done within the framework of the State budget programme "Environment protection and hydrometeorology", which also included expenditures on water supply and sanitation infrastructure investments. While the operating costs of the Ministry of Environment and the NEF (in part) are financed from the general State budget, environmental investment projects as well as water sector investments have been financed from the resources of the NEF and foreign financial assistance. (There is no information on private sector environmental protection expenditures.)

It should be noted, however, that, within the framework of the international Classification of Functions of Government (COFOG), only expenditures related to wastewater management – but not water supply – are classified under the heading of environmental protection. However, there is no separate information on expenditures related to wastewater investments for the Republic of Moldova, but only for the aggregate of expenditures for the water supply and sanitation sector. As from 2013, there is a separate State budget programme "Water management" which, together with the budget programme "Environment", is executed by the Ministry of Environment. Separate expenditure data for these two programmes are available only from 2010 (table 3.11). There is, however, no breakdown of domestic resources and foreign funds contributed to each of these budget programmes.

Aggregate domestic resources have been on an upward trend in recent years, reflecting, notably, the strong growth in earmarked revenues of the NEF. Total domestically financed expenditures on environment and water sector projects amounted to some 270 million lei (some €17.5 million) in 2012. This corresponded to 0.8 per cent of total government expenditure, up from 0.6 per cent in 2009. Total domestic resources have corresponded to only 0.3 per cent of annual GDP since 2009 (table 3.11).

In the Republic of Moldova, data as statistical evidence on environmental expenditures are made according to administrative units (districts) and not economic sectors. Therefore, there are no data collected on environmental expenditure by enterprises.

Environmental funds

There is a two-tier system of environmental funds in the Republic of Moldova, which consists of the NEF and 36 local environmental funds. The NEF is under the direct supervision of the Ministry of Environment; it is not a separate legal entity. The general mandate of the NEF is to provide grants for supporting environmental protection projects and environmental research, as well as supporting environmental NGOs. The potential beneficiaries of funding are local government institutions, enterprises, civil society organizations and other institutions.

The NEF is administered by a management board, which is chaired by the Minister of Environment; the Deputy Minister of Environment is the vice-chair. There are, moreover, four representatives of government institutions (Ministry of Finance, Ministry of Regional Development and Constructions, Ministry of Agriculture and Food Industry, and the State Chancellery) and a representative of environmental NGOs. The latter is elected by an assembly of environmental NGOs and the post rotates on an annual basis.

Table 3.11: Expenditures under the State budget programme "Environment protection and hydrometeorology"

Programmes/Financing sources	2007	2008	2009	2010	2011	2012	2013
Programme I. Environment protection (million lei)	133.3	126.1	183.2	188.0	198.6	284.1	256.0
Programme II. Water sector management (million lei)	..	..	..	16.0	76.6	140.1	1,026.4
Total expenditures (million lei)	**133.3**	**126.1**	**183.2**	**204.0**	**275.2**	**424.2**	**1,282.4**
Financing sources							
State budget resources (million lei)	**133.3**	**126.1**	**183.2**	**204.0**	**275.2**	**424.2**	1,282.4
of which:							
Ministry of Environment (expenditures on operating costs) (million lei)	29.4	37.9	36.9	58.1	57.8	62.1	63.6
National Environmental Fund (million lei)	84.9	58.7	129.1	145.9	156.6	207.5	222.8
Foreign funds for investment projects (million lei)	19.0	29.5	17.3	0.0	60.8	154.6	996.1
Total resources	**133.3**	**126.1**	**183.2**	**204.0**	**275.2**	**424.2**	**1,282.4**
Total resources (€ million)	8.6	8.1	11.8	13.1	17.7	27.3	82.4
Total resources (per cent of total general government budget expenditures)	0.6	0.5	0.7	0.7	0.9	1.2	3.3
Total domestic resources (per cent of total general government budget expenditures)	0.5	0.4	0.6	0.7	0.7	0.8	0.7
Total resources (per cent of GDP)	0.2	0.2	0.3	0.3	0.3	0.5	1.3
Total domestic resources (per cent of GDP)	0.2	0.2	0.3	0.3	0.3	0.3	0.3

Source: Ministry of Environment; ECE Secretariat calculations.
Note: Actual expenditures. Data for 2013 are projections.
Expenditures on water sector management for 2007–2009 are included in Programme I: Environmental Protection.
Domestic resources = Operating expenditures of the Ministry of Environment and expenditures of NEF.
Exchange rate: €1 = 15.56 lei (average annual exchange rate in 2012).

The project beneficiaries are mainly local governments, which typically have to take the initiative to develop project proposals. The role of the NEF is mainly limited to collecting and assessing relevant information on submitted projects. It has not developed its own medium-term plan for the allocation of financial resources, so the allocation of funds to various environmental domains depends largely on the type and sequencing of projects submitted by the potential beneficiaries. There is an established formal framework for the review of project proposals, which can involve experts from the Ministry of Environment and other government offices, but also external experts.

The Government decided in 2010 to increase human resources in the NEF by five new professional posts, adding to the only two staff at that time. The new staff have been involved in project management and are paid from the revenues of the Fund, while the other two are financed from the budget resources of the Ministry of Environment. There have been lingering concerns about the performance of the NEF concerning issues of procedure and managing capacities, project cycle management, accountability and resources management. The Government, in its report on the implementation of the Government Activity Programme in 2011 and Action Plans for 2012, emphasized the need to improve the oversight and executive management of the environmental funds, to more clearly delineate the responsibilities, regulate the avoidance and resolution of conflicts of interest, and define a stricter regulatory hierarchy, as well as to strengthen public control over the use of the environmental funds, including monitoring of outcomes. The NEF does not have an effective operational manual; furthermore, it does not publish an activity report.

As noted above, the financial resources of the NEF have been significantly strengthened since 2009. As a result, the annual expenditure of the NEF rose to 207.5 million lei (€13.3 million) in 2012, compared with an annual average of some 72 million lei (€4.6 million) in 2007–2008. Nonetheless, during the period 2010–2012, total NEF expenditure accounted for, on average, only some 0.5 per cent of total government expenditure, corresponding to 0.2 per cent of annual GDP.

During 2010–2012, the main emphasis of financing agreed to by the NEF was on investments in the water supply and sewerage infrastructure (55 per cent), flood protection and rehabilitation measures and river banks consolidation (20 per cent) and solid waste management (10 per cent). These three domains accounted for some 84 per cent of total project values. However, the limited human and financial resources of the NEF are thinly spread. More than 800 projects were accepted for financing during 2010–2012, raising the issue of effective priority setting and adequate project management. Given the large number of projects, the average funding per project is, obviously, low. To illustrate, the financing provided for the water supply and sewerage sector (335.1 million lei or €21.5 million) is spread over 253 projects, i.e. on average, €85,000 per project. Of total projects to be financed, the average project value is about €50,000. It is noteworthy that the 1996 Law No. 847 on budget system and budget process provides the NEF with the possibility to carry over unused revenues to following years, provided the objective they are used for has not changed.

The 36 local environmental funds are closely integrated with the territorial units of the SEI. Each of the 36 funds is administered by a management board that is chaired by the head of the corresponding territorial environmental inspectorate. There are four other members: the deputy mayor or deputy district president (vice-chair); a municipal council member in charge of environmental protection; a representative of the local centre for preventive health; and a representative of a local environmental NGO.

The aggregate expenditure of the local environmental funds is much more limited than that of the NEF. Average annual expenditures amounted to 4 million lei (€0.25 million) during 2010–2012, corresponding to 2.5 per cent of NEF expenditure or 0.01 per cent of total government expenditure. This also includes bonus payments to staff of the local ecological inspectorates. On average, each of the 36 local environmental funds spent some 111,000 lei (€7,325) per annum during 2010–2012. This suggests that the projects supported by the local funds are typically limited to addressing genuine micro-environmental issues.

Foreign financial support

There has been considerable foreign financial support provided to the Republic of Moldova aiming, in general, at helping promote the country's various medium-term development strategies, such as the Economic Growth and Poverty Reduction Strategy for the period 2004–2006, and the NDS for 2008–2011 and 2012–2020. According to the OECD-DAC database, total official development assistance (ODA) to the Republic of Moldova amounted to some US$1.9 billion during 2006–2011, corresponding, on average, to some 6 per cent of GDP per annum. The large bulk of this assistance was aimed at social spending (health, education and

social services), the development and improvement of public administration systems, government reform, transport and energy infrastructure and agricultural development. Among the major donors have been the EU, the United States of America, the EBRD and the World Bank. Only a very small share (less than 5 per cent) of these funds was allocated to environmental protection.

Foreign funds allocated to the State budget programme "Environment protection and hydrometeorology", including the water supply and sanitation sector, were relatively modest up to the year 2010 but increased significantly in the period 2011–2013. Foreign assistance for investment projects amounted to 154.6 million lei (€10 million) in 2012 and is planned to increase to 996 million lei (€64 million) in 2013. If this is realized, foreign resources would exceed domestic resources by a factor of 3.5 in 2013 (table 3.11). The large bulk of these foreign resources are, however, allocated to the water supply and sanitation sector within the framework of ENPI, supplemented by funds from other countries.

There is an integrated database of external assistance, which manages information on aid (project and direct budget support). It also collects data on ODA (planned and disbursed) per annum. The inclusion of a project in the database is a necessary condition for VAT exemption. The database is (currently) managed by the Aid Coordination Unit of the State Chancellery.[2] It is noteworthy that the database has water supply and sanitation as a separate sector, but not environmental protection, which is lumped together with other activities under the heading of "Multi-sector/Cross-cutting issues". The total value of foreign assistance projects across all sectors launched during 2009–2013 amounts to €1.6 billion, of which the water supply and sanitation sector accounts for €91.5 million (5.7 per cent) and the "Multisector/Cross-sectional issues" for €27.7 million (1.7 per cent).

In March 2010, the Partnership Principles Implementation Plan was signed by the Government and major donors (World Bank, EU, United Nations and many bilateral donors). It was designed to improve the cooperation and coordination between the government and donors, but also among the donors themselves. The coordination of donors, however, remains a continuing challenge for the Republic of Moldova given their large number. The challenge for the government is to ensure the effective ownership of its various national, sectoral and regional development strategies, to effectively align foreign aid with them and avoid addiction to foreign aid.

[2] State Chancellery Department of Coordination of Policies, External Assistance and Public Administration Reform, National Coordination Unit

Other domestic institutions

There are a few domestic institutions which have mandates that are directly or indirectly also related to environmental protection. These include the National Fund for Regional Development (NFRD), the Social Investment Fund, the Road Fund and the Energy Efficiency Fund.

National Fund for Regional Development

The NFRD was established in 2010 and became operational in 2011. It is the major domestic source for the financing of regional development priority projects. The Fund is administered by the Ministry of Regional Development and Constructions. Among the priority areas are the rehabilitation of physical infrastructure, including water supply and sewerage networks, and environmental protection, with major emphasis on solid waste management. As from 2013, the Fund will also engage in energy efficiency projects. There are currently three regional development agencies (Centre, North and South) that are responsible for the implementation of projects and report to the Ministry of Regional Development and Constructions on activities and results achieved. The revenues of the Fund originate from the State budget and should, as officially stipulated, amount to at least 1 per cent of total annual State budget revenues. However, the resources allocated have fallen short of this benchmark so far. The Fund received 134 million lei (€8.6 million) in 2011 and 160 million lei (€10.2 million) in 2012. This points to the strong reliance of the NFRD on foreign assistance for making a noteworthy contribution to regional development strategies.

The Fund provides grant finance, and projects are selected by an interministerial committee including the Ministry of Regional Development and Constructions, the State Chancellery, the Ministry of Economy, the Ministry of Finance, the Ministry of Transport and Roads Infrastructure, the Ministry of Environment and the State Tourism Agency. Total expenditure on environmentally related projects (solid waste management, water supply and sewerage systems) amounted to 65.5 million lei (€4.21 million) in 2011–2012. This corresponds to some 20 per cent of total NEF expenditure during this period. However, the bulk of financing of these NFRD projects came from foreign sources. Although project

areas supported by these two funds (NFRD and NEF) partly overlap, the extent of coordination between the NFRD and the NEF has been weak so far. The same holds for the coordination of programmes with national water supply and sewerage development goals.

Social Investment Fund

The Social Investment Fund was created with the support of the World Bank and donors (Germany, Sweden and the European Commission) and became operational in 1999. The central goal is to contribute to the implementation of the national development strategies by building the capacities of poor communities and their institutions to manage their own priority development needs. Some of the projects financed also have direct or indirect environmental benefits, such as a recent demonstration project for the production of low-cost energy based on solar energy and the use of agricultural wastes from rural communities, which benefits many public facilities, such as schools and kindergartens. There has also been financial support for the improvement of water management and sanitary services in poor rural communities by supporting the rehabilitation and construction of water supply, irrigation, sewerage and water purifying systems, small lakes and dams, and wells.

Road Fund

The Road Fund, which was established in 1996, has as its major objective the financing of maintenance, rehabilitation and extension of public road networks. Road improvements also have an environmental impact to the extent that they lead to lower fuel consumption by motor vehicles, which will lead to lower emissions of air pollutants. Improved roads can also reduce noise pollution. The Fund has also invested in creating green areas in road protection zones. It is financed by earmarked revenues from motor-vehicle-related taxes and charges. As from 2009, the Fund receives 80 per cent of the revenues from road motor fuel excises.

Other revenue sources are the registration tax for cars registered in the Republic of Moldova, the road tax applied to vehicles with characteristics exceeding permissible limits, and fees for permits for the execution of works in road protection zones. The total budget of the Fund amounted to 788 million lei (€51 million) in 2011. The rehabilitation of the road sector in the country has been supported by loans from the EBRD and European Investment Bank, and grants from the European Commission.

Energy Efficiency Fund

The Energy Efficiency Fund was established in 2012 in accordance with the 2012 Regulation on the Organization and Operation of the Energy Efficiency Fund. The major principles guiding the Fund are stipulated in the 2007 Law on Renewable Energy. The Fund is an independent legal entity. The major decision-making body is the Board of Administration, which is composed of representatives of relevant ministries and members selected from the private sector.

The major objective of the Fund is to promote the financing of energy efficiency and renewable energy projects that are aligned with government policy in these areas. The resources of the Fund come partly from annual allocations from the State budget, which should correspond, in principle, to 10 per cent of the Fund's financial needs to achieve the Government's targets for energy efficiency and renewable energy. The main sources of funds will have to be grants and loans from foreign institutions as well as loans from the domestic financial sector. At the time of writing, however, the Fund is not yet operational, reflecting, inter alia, the need to complete the appointment of board members and define eligibility criteria for project selection.

3.3 Legal and policy framework

Legal framework

Public sector environmental expenditure, apart from the operating expenditure of the Ministry of Environment, is financed by the NEF and the local environmental funds. The revenues of the environmental funds are earmarked taxes and charges based on the 1998 Law No. 1540-XIII on Payment for Environmental Pollution (as amended). The other domestic source of financing of environmental projects is the NFRD, which became operational in 2010.

The overall planning of government environmental expenditure is done within the MTEF that was introduced in 2003. The MTEF aims to set fiscal targets and to allocate resources so that they reflect the general development and sectoral priorities within the limits set by the established fiscal targets. The environmental funds and the NFRD are integrated into the MTEF. Until 2012, the water supply and sanitation sector was part of the environment sector expenditure strategy. The (draft) MTEF for 2013–2015 introduced a separate expenditure strategy for the water sector. However, this does not exclude the

NEF from continuing to finance water sector projects.

In the wake of the adverse impact of the global financial crisis in 2008, the Government has been stepping up efforts to contain budget deficits by curtailing expenditure and raising revenues. In this context, a law on fiscal responsibility is to be adopted that will tie the government to strict fiscal rules and improve transparency in resource allocation. Those principles are enshrined in a new draft law on public finance, which is before the parliament. The draft law stipulates, inter alia, the abolition of earmarking of specific revenues, such as those that have until now provided the financial resources for the NEF. This would raise the major challenge for the Ministry of Environment to make its voice better heard in the process of preparation of the medium-term State budget expenditure frameworks and the annual State budget allocations. It would require, notably, a stronger capacity to develop effective and convincing environmental programmes.

The Government has been promoting public–private partnerships (PPPs) for the provision of a range of public services, such as communal utility services. The main components of the legal framework adopted for this purpose are the 2008 Law No. 179-XVI on Public–Private Partnerships and the 1995 Law No. 534-XIII on Concessions. The background to this is the poor state of public services and infrastructure in the Republic of Moldova, given the lack of sufficient resources for their rehabilitation, modernization and extension. The role of these PPPs is still quite small, but could grow, depending on the extent to which tariffs for these services allow for full cost recovery on a sustainable basis.

Policy framework

The National Development Strategy (NDS) for the period 2008–2011 had as one of its aims to move the country onto an environmentally sustainable development path, although environmental protection (Pollution abatement and efficient use of natural resources) was part of the priority area “Regional Development”. A new, medium-term NDS for the period 2012–2020 was adopted by the parliament in 2012 and is designed to pursue the Government’s reform agenda and mobilize financial support from donors. The new NDS has seven priority areas: education, access to financing, road infrastructure, business regulation, energy efficiency, justice system and social insurance. Environmental protection appears to be implicitly treated as a cross-cutting issue.

The National Regional Development Strategy for the period 2009–2011 was adopted in order to strengthen financial, institutional and human capacities at the local level. This led also to establishment of the special NFRD in 2010. The National Development Strategies, together with the MTEF, are, in principle, the basis for allocation of annual State budget funds in line with national priorities.

The Government has adopted separate development strategies for the waste management sector and the water supply and sanitation sector, which are in the process of implementation. The Energy Strategy of the Republic of Moldova until 2020 aims at promoting investment in renewable energy sources and in the improvement of energy efficiency. ANRE has developed the tariff methodology designed to create incentives for private investors to engage in the renewable energy sector; however, it is not yet applied.

Given the importance of ensuring affordability of communal services tariffs for low-income households, the Government has made considerable progress in establishing targeted social assistance schemes. This was part of a larger project supported by the World Bank from 2007, which was designed to improve the effectiveness of health and social assistance. The former social support system was not well targeted, covering only a small proportion of the poorest segments of the population. According to the Ministry of Labour, Social Protection and Family, however, the coverage rate of households eligible under the new scheme rose to nearly 70 per cent by the end of 2010.

3.4 Conclusions and recommendations

Since 2005, the system of payments for environmental pollution has been maintained without any significant changes. These payments generate revenues for the environmental funds, but there is no supporting evidence that they provide significant incentives, if any, for pollution abatement.

The system of taxes for emissions of air pollutants from stationary sources and for discharges of water pollutants applied in the Republic of Moldova is administratively complex due to the very large number of pollutants that are covered. This significantly weakens the effectiveness of the system. Charge rates (per ton), moreover, have remained broadly stable at a low level over the past decade or so and have been eroded by inflation.

Payments for emissions from mobile air pollution sources are applied in the form of an ad valorem

excise on the import value of motor fuels. The tax base is, therefore, not at all pollution oriented, leaving aside the fact that the tax rates applied are very small and have not changed over recent years. The upshot is that this tax, in contrast to the specific excise on petrol and diesel (established in the Tax Code), has not had any impact on motor fuel price developments over the past years.

The pollution charges on the storage and disposal of enterprise waste are biased towards storing toxic and non-toxic waste on enterprise premises, and this does not create any incentives for significantly reducing waste generation. The rationale for this tax is not obvious once it has been ascertained that waste has been stocked according to established regulatory standards.

The tax base (customs value) for the product charges on imports of environmentally harmful products is also neither pollution oriented nor related to the costs of damage prevention. These product charges are, moreover, not applied to similar domestically produced goods.

Furthermore, the tax rates are, in general, very low. The upshot is that the role of the current system of payments for pollution is limited to generating revenues for the environmental funds.

Recommendation 3.1:
The Government should undertake comprehensive reform of the system of pollution charges in order to provide significant incentives for pollution prevention and abatement, and a sound basis for environmental financing and, notably:

- *(a) Apply pollution charges only to major air and water pollutants;*
- *(b) Establish a credible timetable for raising emission charge rates to levels that provide effective incentives to reduce pollution;*
- *(c) Abolish the ad valorem charges related to mobile pollution sources, given that the tax base is not pollution oriented;*
- *(d) Introduce specific charges per unit of imported environmentally harmful products (i.e. not based on their import value) and also apply similar product charges to these products that are domestically produced, including for the handling of electric and electronic equipment waste;*
- *(e) Identify and eliminate, step by step, environmentally harmful subsidies;*
- *(f) Create effective incentives for enterprises to manage production waste in an appropriately regulated and monitored manner.*

Although tariffs for water supply and sanitation have increased significantly over recent years, they are, in general, not yet at a level that allows for recovery of operating and maintenance costs, let alone depreciation allowances. There are, moreover, sizeable cross-subsidies flowing from enterprises to private households. ANRE has developed a methodology for determining the level of cost recovery tariffs, which municipal councils are, however, unwilling to apply for reasons of local policy. In the event, the operations of the water companies are not financially sustainable and the water supply and sanitation infrastructure has progressively deteriorated. In a similar vein, the municipal waste services need to be upgraded to move progressively closer to international standards. This will not be possible without adequate fees for municipal waste collection and disposal.

Recommendation 3.2:
The Government should:

- *(a) Review the current system of tariff setting for water supply and sanitation services with a view to transferring tariff setting to an independent regulatory body that applies cost-recovery standards;*
- *(b) Encourage local governments to ensure that municipal waste fees allow for recovery of the increasing costs of waste services, given that these have to meet progressively higher environmental standards;*
- *(c) Ensure, within the framework of the reformed targeted social assistance policy, that low-income households have adequate access to water and waste services as well as other communal services.*

There are several public sector funds in the Republic of Moldova that are financing environmental protection and other sustainable development projects. The major domestic actor is the National Environmental Fund (NEF), which finances projects from a number of earmarked taxes and other charges. There are, moreover, projects that are directly financed by grants and loans from international donors. The level of domestic environmental protection expenditure has increased in recent years, but overall it has remained quite low relative to the considerable financial resources required to adequately address the looming environmental challenges, including wastewater management.

Moreover, the future of the earmarking of specific revenues for the environmental funds is uncertain, given the stipulations of the new draft public finance law. Furthermore, there is lingering criticism about the functioning of the NEF, including the extent of coordination between the NEF and the NFRD.

Recommendation 3.3:
The Government should:

(a) Reform the National Environmental Fund, taking into account international experiences and standards in areas such as public procurement, transparency requirements and decision-making structure;

(b) Strengthen the capacity of the Ministry of Environment to develop effective and economically sound environmental investment programmes, which is a necessity for making its voice better heard in the State budget planning process;

(c) Strengthen the coordination and cooperation among the relevant ministries and government agencies to ensure that programmed activities by the various actors in the environmental sector (including foreign aid donors) avoid duplication and are aligned with the overall priorities set in national development and sectoral strategies.

Chapter 4

ENVIRONMENTAL MONITORING, INFORMATION AND EDUCATION

4.1 Environmental monitoring

The Ministry of Environment coordinates activities on environmental monitoring. In support of this work there are a number of institutions operating under the Ministry with specific tasks in monitoring certain environmental factors such as surface and groundwater, air, soil, radioactivity and biodiversity. Other ministries, for example the Ministry of Health, also have some responsibilities for environmental monitoring mainly in relation to human health issues (e.g. the quality of drinking water), complementing the activities carried out by the environmental network.

An integrated environmental monitoring system is not yet established in the country. The concept is, however, reflected in the draft environment protection law currently submitted to the government for approval. The integrated environmental monitoring system is seen as a centrepiece for the sustainable management of natural resources, for enhanced cooperation and information sharing between various institutional players.

Currently, the monitoring landscape remains fragmented with many institutions involved in the process and limited information sharing between them. However, compared with 2005, significant progress was registered in some areas such as water monitoring, especially for surface waters. At the same time, improvements were registered in other areas such as forests and protected areas, soil and radioactivity. Mixed progress is registered on air monitoring, with limited monitoring capacity of urban air quality. Biodiversity also lacks systematic monitoring, with fragmented or non-systematic activities carried out by various organizations. Map 4.1 provides an overview of monitoring networks in the country. The latest developments taking place in the field of environmental monitoring, including the role of individual governmental bodies and institutions, are presented below.

Air quality

In the Republic of Moldova, the State Hydrometeorological Service (SHS) operates 18 ambient air monitoring stations. These are located in Tiraspol (3), Ribnita (2), Bender (4), Chisinau (6), Balti (2) and, since 2007, in Mateuti (1). The sampling is manual and takes place three times every 24 hours. Since 2007, Mateuti has an automated station measuring, in real-time, parameters such as NOx, SO_2, H_2S, CO, ground-level ozone and total suspended particles (TSP). The rest of the stations primarily monitor SO_2, CO, NO_2, PM_{10} and TSP. Apart from at Mateuti, monitoring of suspended particles has been performed since 2007 at Leova station and, since 2012, also in Chisinau.

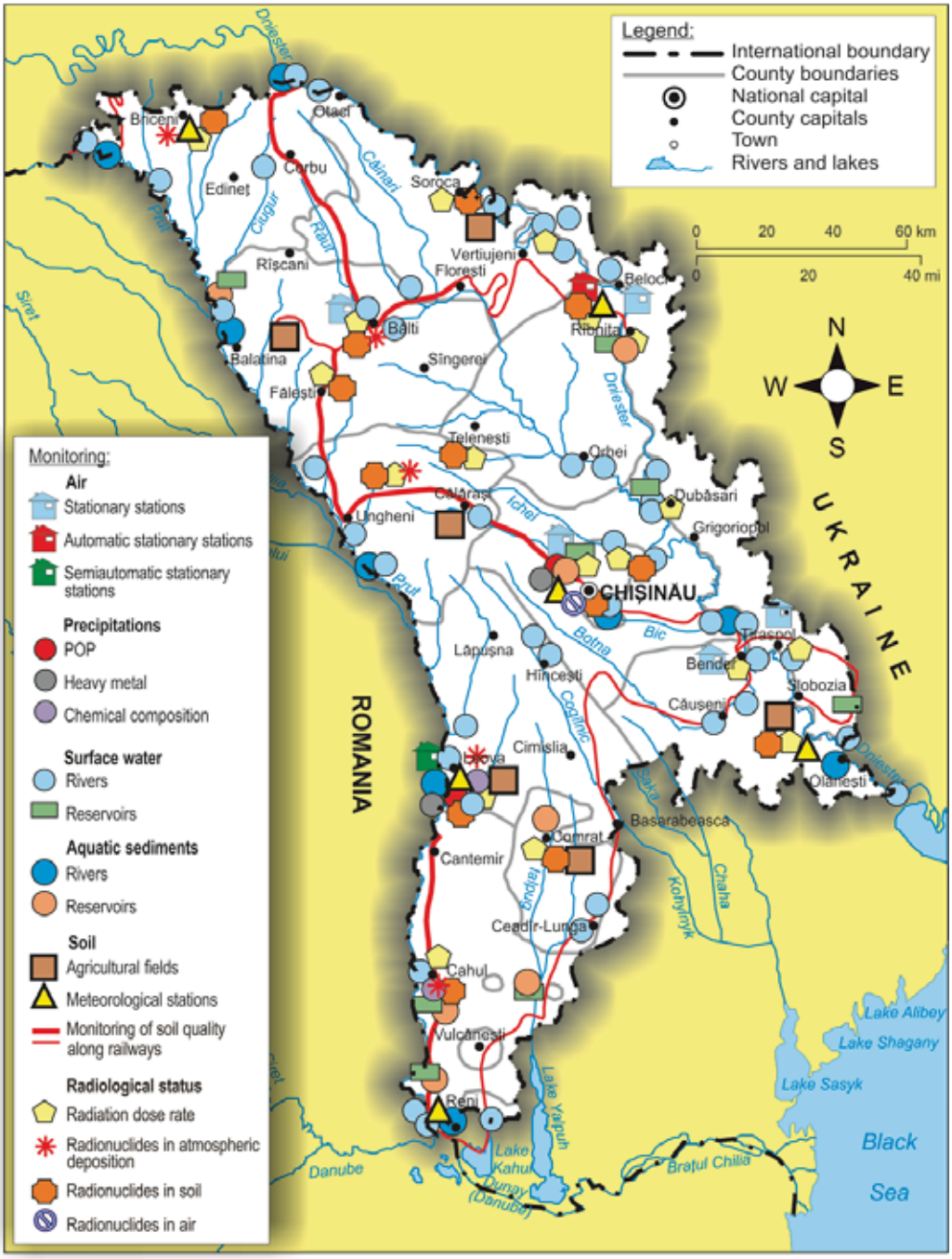
The only transboundary air pollution monitoring station currently in operation, at Leova at the border with Romania, was modernized in 2007; however, it often faces shortages of the necessary consumables or spare parts for its continuous operation.

The observations are made according to the European Monitoring and Evaluation Programme (EMEP) – EMEP-I in full and EMEP-II in part – and comply with the reporting obligations under the Long-Range Transboundary Air Pollution (LRTAP) Convention.

As at the time of the last EPR in 2005, the Ministry of Health is currently monitoring air quality in urban areas. Monthly, maximum concentrations of six air pollutants are measured in the ambient air in residential areas and also indoors: TSP, O_3, NO_2, SO_2, CO and Pb. Data collected are stored in a dedicated database not available for public use. Aggregated data are delivered to the Ministry of Environment and also published in various publications and reports available electronically.

The monitoring of chemical parameters in precipitation is taking place in Chisinau, Cahul, Cornesti, Balti and Leova, and Stefan-Voda and Briceni were added in 2011. The parameters currently monitored are: sulfates, chlorides, ions of Ca, Mg, Na, K and ammonia, nitrates, hydrogen-carbonates, pH and conductivity, with Na, K and conductivity introduced in 2009. Since 2005, the monitoring of persistent organic pollutants (POPs) and heavy metals in precipitations is taking place in Chisinau and Leova.

Map 4.1: Networks of environmental quality monitoring, 2011



Source: Division of Environmental Quality Monitoring, State Hydrometeorological Service, 2011.
Note: The boundaries and names shown on this map do not imply official endorsement or acceptance by the United Nations.

Furthermore, since 2009, monitoring data from Tiraspol, Ribnita, Dubasari and Camenca have been transmitted to the SHS. The only case of an economic agent having its own self-monitoring system for air quality with real-time information is the cement factory Lafarge.

Water quality

The SHS undertakes observations on the hydrological regime for the whole territory of the country. This task is ensured through a stationary hydrological network consisting of two hydrological stations placed in Balti and Dubasari and 46 hydrological posts, of which 11 are located on the Prut River, 12 on the Dniester River and one on the Danube River. All stations record water level and water temperature. Samples of water quality are taken monthly and analyses are made for 49 hydrochemical parameters and seven hydrobiological parameters. The sampling is taking place in the same hydrological posts where the water level and temperature are measured. It is

carried out manually by the Expedition Group, which is equipped with a mobile laboratory and modern techniques and equipment allowing real-time calculation for a number of parameters in the surface water (pH, BOD, dissolved oxygen, CO_2, CO_3, etc.). The SHS, through its Centre for Environment Quality Monitoring, analyses the content in samples of organochlorinated pesticides, biphenyl polychlorinated, heavy metals, phosphorus, and nitrogen and other parameters. The information collected is stored in an electronic database managed by the SHS. There is no public access to the database.

Monitoring on the transboundary waters (Dniester and Prut rivers) is carried out by the SHS at two points on the Dniester River and seven on the Prut River. The latter points are agreed and jointly managed with the Water Directorate Prut-Iasi (Romania) and cover 26 hydrochemical parameters and two groups of hydrobiological elements. There is a well-functioning system for regular data exchange between Romania and the Republic of Moldova. Similar data exchange exists for the transboundary area of the Dniester River with Ukraine at two points. In 2008, a bilateral agreement between the Government of Ukraine and the Government of the Republic of Moldova entered into force (signed in Chisinau in 2006) aiming to jointly monitor and control the quality of shared waters. Consequently, water quality is monitored at three points, namely on the Prut River at Criva and on the Dniester River at Otaci and Palanca. The joint monitoring covers 22 physicochemical parameters.

Monitoring of the Prut River was substantially improved as a result of a Czech Republic-funded project, "The management of surface waters and protection against floods on the Prut River", carried out during 2010–2012. The project consisted in setting up a modern automated monitoring network along the Prut River (11 automated hydrologic stations were installed). The project was implemented with the participation of SHS experts, who were also trained in the use of the new equipment.

For the implementation of the Convention on Cooperation for the Protection and Sustainable use of the Danube River, systematic monitoring of water quality is ensured on the Prut River within the Transnational Monitoring Network at six control points. The monitoring covers 56 physicochemical parameters.

The National Centre for Public Health (NCPH) monitors water quality in 11 surface water bodies at 229 fixed points, including 37 points on the Dniester and Prut Rivers which represent drinking water supply sources. Monitoring covers 36 chemical parameters and 10 microbiological, including parasitological, parameters in conformity with the 2010 GD No. 384 on the service of State supervision of public health. There is no monitoring of biological parameters of surface water used for drinking water supply in the country. Data are collected in electronic format in a database at the NCPH and provided as aggregated figures to the Ministry of Environment, and are also available on the Ministry's website.

The groundwater monitoring network of the Agency for Geology and Mineral Resources (AGMR) remains practically unchanged with approximately 180 acting observation boreholes currently located on 33 fields. Measurements are made once every three days and transmitted in paper format to the AGMR where they are entered into a database which is not accessible to the public. Considering the declining State of the existing boreholes, questions might be raised on the quality and reliability of the information collected.

The Ministry of Health's territorial centres for public health monitor drinking water quality in underground wells in rural areas (approximately 4,600 in 2012) and in 11 surface water bodies. Waters for bathing are monitored during the bathing season (approximately four months a year) in designated bathing places in both urban (at seven posts on the Dniester River and eight posts on the Prut River) and rural areas.

Soils

The SHS, through its Centre for Monitoring Soil Quality (CMSQ), monitors soil quality in selected areas on a rotation basis at intervals of four to five years. The monitoring network currently covers:

- Agricultural lands (approximately 3,500 ha spread across six to 10 districts);
- Land with specific protection status (in nature and scientific reserves and forestry areas);
- Land in the vicinity of pesticides storage facilities (28 points);
- Land in the proximity of electro-energy installations (contaminated with PCBs; 12 points);
- Soil pollution in urban areas (in 10 major cities);
- Soils of roadside strips in zones of influence of highways with different traffic intensities (seven points).

Photo 4.1: Celebrating the Day of Chisinau

The last two monitoring activities are relatively new, having been added in 2009–2010. Based on the 2009 GD No. 81 on regulation of polychlorinated biphenyls (PCBs), a national inventory of PCBs is currently being developed.

A project funded by the World Bank/Global Environment Facility (GEF) (2008–2010) was implemented by the Ministry of Environment, for the inventory and mapping of sites contaminated with POPs. Detailed results are available on the website of the Ministry of Environment in a dedicated report, together with a database of POP- contaminated sites.

The institutions of the Ministry of Health monitor soil quality in recreational areas, human settlements (in particular, schools and playgrounds) and areas around drinking water intakes. This microbiological control is carried out at least once per year when renewing the sanitary permit for operation of the relevant institution. In 2012, for example, the NCPH was collecting 759 samples for chemical parameters, 1,195 samples for microbiological parameters and 1,011 samples for parasitological parameters.

Currently, the national legislation related to monitoring soil quality contains only maximum admissible limits for nitrogen, heavy metals and microbiological content. The Agrochemical Service of the Ministry of Agriculture and Food Industry monitors soil quality, including some pesticide residues on agricultural lands. In the framework of bilateral cooperation between Romania and the Republic of Moldova, a new project was launched in February 2013 with the aim of opening a laboratory for the detection of pesticide content in plants, soil and products of non-animal origin.

The Agency "Apele Moldovei" monitors irrigated land. A five-year programme, Compact, funded by the United States of America under the Millennium Challenge Fund, was launched in 2010. One of its purposes is to reform the irrigation system and rehabilitate a number of existing systems, covering up to 15,000 ha (chapter 10). In December 2011, as part of the programme, a monitoring and survey unit was created and started to operate in the Agency. The unit, which is technically equipped under the project (including a vehicle for field checking), is monitoring and ensuring technical survey of soil quality for the irrigation systems belonging to the Association of Water Users.

Radioactivity

The SHS, through its Department for Environmental Quality Monitoring, is responsible for assessing the radioactive situation. Systematic observations on the level of exposure to gamma radiation are carried out twice per day at 7 a.m. and 8 p.m. at 18 meteorological stations, as well as online at the Mateuti automatic station.

In 2009, investigation of radioactive aerosols in the ambient air was started with the installation of a station (ASS-500) in Chisinau. In 2010, the monitoring of anthropogenic and natural radionuclides in surface waters was initiated. The Department also takes observations of anthropogenic radionuclide 137Cs (Cesium-137), 90Sr (Strontium-90), and activity of beta and gamma radiation in the atmospheric depositions, and also determines radionuclide composition in non-cultivated soil – 226Ra (radium-226), 232Th (torium-232) and 40K (calium-40).

In 2007, cooperation was established between the National Agency for Regulation of Nuclear and Radiological Activities of the Republic of Moldova and the International Atomic Energy Agency (IAEA). Cooperation is taking place in the framework of the Global Network of Isotopes in Precipitation (GNIP). Within this framework, since 2009 SHS has been monitoring natural and technogenic radionuclides as well as radioactive fallout.

Noise and vibration

There is no monitoring in place for noise and vibrations in the country. The draft environmental protection law makes specific reference to this type of pollution and indicates the role of the competent authority in drawing noise maps and developing noise indicators for estimating the level of phonic pollution. Furthermore, the draft environmental protection law makes specific reference to EU Directive 2002/49/EC relating to the assessment and management of environmental noise.

Biodiversity

There is currently no national monitoring system for biodiversity. The lack of systematic activities in this area has led to a fragmented and inconsistent picture of biodiversity and its conservation status. For example, the third edition of the Red Book of the Republic of Moldova – still to be published – presents an increasing number of threatened species of plants and animals and also acknowledges the advanced degradation status of some habitats, which require urgent attention. But in the absence of a systematic monitoring system, these findings are difficult to substantiate and their reliability remains questionable.

Several institutes of the Academy of Sciences (e.g Institute of Zoology, Institute of Ecology and Geography) are studying the wildlife of the Republic of Moldova, but these activities are limited and sporadic. At the same time, some universities (such as the State University of the Republic of Moldova and the State Agrarian University) are also doing research related to biodiversity and its protection status.

Forest monitoring

Forest monitoring is managed by the Agency "Moldsilva". Monitoring covers State forests, which occupy 11 per cent of the territory. The information collected is stored in a database by the Agency. Only aggregated data are open to the public and policymakers. The information covers the State forests, representing 90 per cent of the total forested area. (Few data exist on forests owned by municipalities.) The State funds available for monitoring biodiversity in the State forests by the Agency "Moldsilva" are very limited. The SEI, through its control activities, has records on the volume of wood legally harvested and on illegal logging. Under the current institutional setting there is a shortfall in the coverage of biodiversity monitoring, data sharing and, consequently, the management of this area by the various institutions involved.

Analytical laboratories

There are accredited laboratories in the country, subordinated to either the Ministry of Environment or the Ministry of Health, which perform analysis of various environmental factors (air, water, soil, chemicals and radiation).

In terms of national coverage, the Ministry of Health has laboratories for air, water and soil in all districts and in two cities (Chisinau and Balti). In the capital city, the central laboratory is located at the NCPH. This laboratory is taking part in several international intercalibration programmes such as EMEP, and also participates in joint sampling exercises with similar structures in Ukraine.

Data collected from the laboratories are stored in a database at the NCPH. With the exception of data on drinking water, these data are not available to the public and not even to governmental authorities such as the Ministry of Environment. National data on the quality of drinking water are available only in an annual collection prepared by the NCPH.

The association of water supply and sewerage "Moldova-Apa Canal" has accredited laboratories for monitoring drinking water quality at each of the 12 water purification plants.

Ecological analysis centres (EACs) under the SEI have the role of controlling the state of various environmental factors and carrying out laboratory investigations according to existing standards. Currently, there are 15 national standards for air and soil analysis (mostly national standards but also ISO/IEC standards) and 57 for water analysis. In 2009, three EACs belonging to ecological agencies in Balti, Cahul and Chisinau, were accredited for a four-year period in accordance with ISO/IEC 17025 "General requirements for the competence of testing and calibration laboratories". EACs have the necessary equipment to detect 21 parameters for ambient air pollution, 27 for wastewater, 17 for soil and 10 physicochemical parameters in water.

Over recent years, SHS laboratories have been equipped with modern equipment under various assistance projects. Problems with service, spare parts and consumables have often occurred and the annual allocations from the State budget or the National Environmental Fund are very limited.

For groundwater, the Hydrogeological Expedition (EhGeoM), which has its own laboratory, is contracted by the AGMR on a five-year basis to perform analysis and interpretation of data collected. EhGeoM presents the results of these analyses in a five-year report. The last report was produced in 2010. Analyses are made for 26 hydrochemical parameters and seven microbiological parameters. There is no related database available in the AGMR and most of the information is stored in paper format. In 2010, a proposal for a GD was prepared on the technical concept for the development of an automated information system "Geological State Registry".

4.2 Environmental information and data flows

Information systems

In the Republic of Moldova there is no national environmental information system as such. Individual ministries and institutions have their own databases of relevance for their domain and, in practice, limited sharing or exchange takes place between them.

Water data collected from laboratory analyses and from the monitoring network is sent to the Centre on Integrated Ecological Monitoring and Informational Management (CIEMIM) of the SHS. This Centre is responsible for the storage, collection, generalization, statistical analysis, and assessment of environmental data received. It is responsible for development of a database with systematically updated information on the state of air, surface water and soil pollution. Environment-related information (i.e. meteorology, hydrology, air and soil monitoring) is available on the SHS website (www.meteo.md).

The Agency "Apele Moldovei" holds a database on water use and discharges. Within the framework of the Millennium Challenge Project "Irrigation sector reform activity (2010–2015)", one component aims to convert the paper-based information into electronic form. Only data from the year 2010 are available in electronic form. The stored information is not spatially referenced. The project will assist in improving database development, including the training of local experts.

The AGMR has a paper archive dating from 1890 on all types of geological exploitation activities carried out in the country, including hydrogeology. The AGMR is in real need of being equipped with computers, software (including numerical modeling packages) and modern instrumentation. A database for groundwater exists in the Hydrogeological Expedition, but it is not available even for the AGMR. The valuable maps archive existing in this Agency is in an advanced state of degradation and urgent support is needed for its digitization.

The Ministry of Health, through the NCPH, manages databases for data collected through its regional network on drinking water, air, soil and POPs. Monthly, quarterly and early reports are produced for the Ministry of Health. Data can be provided upon request but currently there are no databases or online public access to the obtained data on POPs.

Overall, the environment-related databases of the Ministry of Health are not accessible to either the Ministry of Environment or its subordinated institutions and are not available for public use.

The SHS stores, analyses and interprets data on ambient air pollution received from the analytical laboratories and data on the radioactive background collected from all stations. This information is available in the national language and is posted on the SHS website (www.meteo.md).

Coordination and data exchange

There is still poor coordination at the institutional level (both national and local) and non-systematic data exchange between them. Currently, none of the institutions involved or responsible for environmental information data is using a networked relational database for storing and exchanging data.

There are, however, good examples of long-term

cooperation between environmental bodies, as is the case in the procedure for the development of the State Water Cadastre. Three institutions share this responsibility: the Agency "Apele Moldovei" (Water Basin Management Department), SHS and AGMR. Each institution, for its particular domain, creates and maintains the electronic data fund as input to the elaboration of the Water Cadastre. It is foreseen that the e-governance programme will facilitate data exchange and sharing among these bodies while preparing the Water Cadastre and ensure the public availability of data.

The issuing of permits for water use (water abstraction and wastewater discharge) is an example of current efforts to improve information exchange among institutions making use of modern technology (e-governance). This procedure requires approvals from several governmental institutions such as the SEI, Agency "Apele Moldovei", AGMR and NCPH. With support from the United States of America under the Millennium Challenge Fund, an electronic platform for the authorization of water use is under development. This new information system will connect virtually all entities involved in the authorization procedure, facilitate information sharing among the entities involved, substantially reduce the time involved and simplify the process.

Environmental statistics

Since 2005, cooperation between the National Bureau of Statistics (NBS) and the Ministry of Environment has been substantially strengthened and formalized through a number of joint regulations. This progress was reflected in the work carried out by the two bodies on environmental statistics and indicators and, furthermore, in the increased use of the environmental statistics in the policy development process.

Since 2009, changes have taken place in the statistical survey for ozone, air emissions, waste and water use. These changes covered the structure of data sets as well as the way data are collected from the reporting units. Local environmental inspectorates are currently responsible for data collection, including data validation.

Public access to statistical data, including environment-related data, has improved considerably – statistical data are available free of charge on the NBS website (www.statistica.md). Furthermore, since 2010, a publication containing environment-related statistics for the country, "Natural resources and the environment", has been prepared annually by the NBS and is available online.

Environmental reporting

The State of the Environment Report (SoER) of the Republic of Moldova produced by the Ministry of Environment is the most comprehensive environmental report in the country. According to the 1993 Law on Environmental Protection, an SoER has to be produced annually. The annual frequency was not maintained in recent years and the last report was produced in 2011 for the period 2007–2010. The draft environmental protection law foresees changing the reporting period to every four years, with a short SoER every two years.

All SoERs are available to the public in electronic format on the Ministry of Environment website. The Institute of Ecology and Geography prepares the document after consultation with the responsible departments in the Ministry of Environment. Other institutions, such as the SHS, AGRM, Agency "Apele Moldovei" and NBS provide information and data to support the various chapters. The flow of data and information feeding into the report is not regular and neither does a source database exist to enable the sustainable production and updating of the report. The report has a rather scientific approach and its use in the decision-making process or by the general public is difficult to assess. The report currently makes no use of environmental indicators and the descriptive approach prevails rather than a more assessment-based approach. The NEF supports the production of SoERs.

Reports have been produced by the Republic of Moldova for major international events, amongst the most recent being:

- Rio+20 conference (2012) – the National Report;
- Environment and Health Ministerial Conference (Parma, 2010) – *Children's Health and the Environment in the Republic of Moldova*.

These reports are heavily based on donor support and expert input, and their production is related to a particular event without including a follow-up process. Although useful and informative, their impact remains limited in time.

Furthermore, the report, *Environmental Protection in the Republic of Moldova*, produced annually by the SEI (approximately 300 pages) combines state-of-the-environment aspects with the results of inspection work during the year.

The SHS publishes on its website (www.meteo.md) daily, weekly, monthly and yearly bulletins on the quality of environmental factors (surface water, ambient air, radioactivity, transboundary air pollution). This information is sent to public authorities and the mass media.

The State Water Cadastre is produced annually by the SHS together with the Agency "Apele Moldovei" and AGRM, the last edition having been published for the year 2009. The NCPH (as reorganized in 2010) publishes reports on sanitary and epidemic conditions in the country and makes them available on its website (www.cnsp.md). However, the latest reports are not yet available electronically.

4.3 Awareness-raising

Starting in 2005, the Ministry of Environment has been regularly publishing *Mediul ambiant* on its website, with the purpose of increasing public awareness and better understanding of environmental issues. However, the content remains rather scientific and not very easy understandable by the general public. The publication is funded by the NEF.

Since 2007, and focusing on water issues, *Water Magazine* was produced four times a year as the joint effort of several environmental institutions and water-related NGOs. The Ministry of Environment and Swiss Agency for Development and Cooperation (SDC) financially supported this process. The last issue of the publication was in 2011; all issues are available on the Ministry of Environment website.

Also in the area of public awareness, during the period 2006–2008, *Ecological Bulletin* was produced by the Ministry of Environment (in paper and electronic format) with international support. Available issues can be accessed on the Ministry's website. Currently, environment-related information is published regularly on the Ministry's website under "Press & News". It is not clear why *Ecological Bulletin* was discontinued.

The Environmental Information Centre within the Ministry of Environment (cim.mediu.gov.md) has a number of environmental materials and publications available for consultation by the general public. The list of titles is available on the website of the Ministry of Environment. Unfortunately, the activity of the Centre has substantially diminished in recent years due to the lack of funds and human resources, and few new publications have been added to the list. In early 2013, the Centre was transformed into an Aarhus Centre and there is hope that activity will be revamped. The NEF is expected to contribute to this development.

A large number of targeted information materials addressing the public at large and the local communities are produced in the framework of various international projects or in partnership with the NEF. For example, a set of information materials was produced in relation to the establishment of the National Park Orhei. In the field of forest protection, illustrated publications such as *Chemarea padurii* and *Padurea – o sansa pentru viitor* have been recently produced by the Agency "Moldsilva" with international donor support. Various publications addressing environmental topics are also produced by the NGO community with support from the NEF or within the framework of various international initiatives.

With support from the NEF, a number of monographs addressing aspects such as flora, fauna and aquatic resources have been produced over recent years. In 2007, for example, a comprehensive monograph was dedicated to the *Surface waters of the Republic of Moldova*, including a dedicated volume, *Wells and natural springs*. Their penetration with the public remains limited, however, due to their scientific nature and price restrictions.

Environmental topics are regularly covered by mass media in the Republic of Moldova. Over 20 years in existence, the magazine *Natura* plays an important role in promoting an environmental friendly attitude towards nature to the general public. The monthly publication is managed by the Ecological Movement of Moldova, and is available on paper and electronically (based on subscriptions).

A calendar of environmental events of international importance is available on the Ministry of Environment website and various activities are organized on these occasions. Examples in this context are the activity competition "Riu curat de la sat la sat" or "Clean water week", dedicated to World Water Day in March every year. The SEI and its regional branches are frontrunners in the organization of these activities.

In parallel, a number of initiatives of national relevance are widely advertised through mass media in order to engage the public at large. Amongst these the "Spring bimonthly ecological campaign" for cleaning the cities and the environment in general is one of the most important. This initiative is organized and jointly supported by the Ministry of Environment, SEI and local authorities through a wide range of activities involving citizens, schools

and NGOs. National Radio broadcasts regular programmes dedicated to environmental events or themes of general interest. On television, programmes with an environmental profile are also available, e.g. "Natura în obiectiv" broadcast weekly and also available on the Internet (http://trm.md/ro/natura-in-obiectiv).

The Ministry of Environment actively promotes activities to raise environmental awareness in the country and organizes regular press conferences and meetings with mass media. At the local level, authorities maintain dedicated websites which also contain environment-related aspects. Good examples are represented by the Falesti municipality (falesti.md/) or by Chisinau municipality (chisinau.md). The latter has a dedicated socioecological department in charge of implementation of environmental policy at the city level. In addition, in 2011, a cooperation agreement between the Municipality of Chisinau and the National Council of NGOs of the Republic of Moldova was signed, with the aim to enhance the role of civil society in the implementation of government policy at the local level and the monitoring of results.

Although progressive in nature, this document has had limited practical value to date.

4.4 Education

In the Republic of Moldova, aspects of environmental education are embedded in the school curricula from pre-school up to university level. The school curricula (for primary, and for secondary and high schools) were revised in 2010 and 2006 respectively and a new civic education module was introduced which also incorporates environment-related aspects. The 1995 Law No. 547-XIII on Education is still in force but has been subject to a number of amendments over the years. In spite of this development, no clear references to environmental education or education for sustainable development (ESD) are to be found in the current legal framework.

Environmental education is present in the school curricula throughout the whole education process but its visibility is often limited. As a consequence, responsibilities for the area and the attached institutional competences are often unclear, not systematic and underfunded. Environmental education and ESD both remain heavily dependent on donor support. There is no formal role for the Ministry of Environment in environmental education and consequently no dedicated budget under the current legal framework.

School education

The education curricula for primary schools were last revised by the Ministry of Education in 2010 with ecological aspects mentioned under the module, Mathematics, science and technology. No significant change in raising the profile of environmental topics in the school curricula can be reported since 2005.

The secondary and high schools curricula were last revised in 2006, with environment cutting across various science disciplines. Environmental topics are addressed in the context of traditional subjects such as biology, chemistry and physics, but are only optional, depending on the express interest of students. For these education levels, too, the situation remains unchanged; there is still no specific reference made to the environment or sustainable development.

There is a consultation process between the Ministry of Education and Ministry of Environment during development of the school curricula. In spite of this, no real progress has been achieved in increasing the visibility of environmental education or ESD.

The school curricula include four hours per year for practical ecological activities. Apart from these, environment-related activities of a practical nature are attached to various disciplines such as biology, chemistry and geography.

Each school year starts with an "ecological hour". In most cases, the environmental material provided to the children ahead of the ecological hour is prepared by the Ministry of Environment with support from the SEI, the Institute of Ecology and Geography and other relevant institutions depending on the ecological topic addressed. In 2012, for example, an ecological hour was dedicated to European Mobility Week and air-related matters, and the SEI provided the information material in preparation for this activity. In 2011, Water – Source of Life was one of the themes addressed during the ecological hour. Some schools also present specific environment-related lessons with the assistance of NGOs.

There is a long tradition of organizing ecology competitions ("Olympics") for high schools at both regional and national levels. In this context, the Ministry of Environment is working jointly with the Ministry of Education, State University and Regional Environmental Centre for Central and Eastern Europe (REC) Moldova.

In December 2012, an interactive website for children in secondary and high schools was launched by the Ministry of Education with the support of the

U.S. Agency for International Development (USAID). This new tool (viatasisanatatea.md) addresses education and life matters, including the environment, and is expected to develop further with the active contribution of the Ministry of Environment and NGOs.

Vocational training

Environmental education is also integrated in the vocational training curricula and donor support facilitates implementation of the strategic objectives for this sector. An example is provided by the Austrian Development Agency, which has, since 2008, assisted the Ministry of Environment in developing and updating vocational curricula and teaching materials for water sanitation specialists.

Higher education

The higher education system is well implemented and several universities have dedicated studies on the environment and ecology and are developing related international cooperation projects. The Ecology College in Chisinau is preparing future environmental engineers and laboratory personnel. Although the College is subordinated to the Ministry of Education, the curriculum is developed in close cooperation with the Ministry of Environment. The State University has, in the Biology and Pedology Faculty, a dedicated curriculum on ecology and environmental sciences at bachelor and master levels. Similarly, the Faculty of Chemistry has developed curricula for industrial and ecological chemistry, environment protection and ecological security for both bachelor and master levels. The State Agrarian University (under the Ministry of Agriculture and Food Industry) also has environment-related disciplines such as Ecology and Tourism and Agro-ecology. The Faculty of Machinery and Industrial Management within the Technical University is developing new professional competences in line with international standards. These refer to the improvement of products and technological processes, including environmental quality and security aspects.

Under the TEMPUS programme, funded by the EU, a CREDO project (Doctoral Programme in Renewable Energy and Environmental Technology) is currently under development (2010–2013). The programme covers several countries including the Republic of Moldova and involves cooperation with several EU universities.

In spite of these developments, admissions to higher education institutions for the discipline of ecology by subject groups show a continuous decline from 2005 to the present. Moreover, although the Ministry of Education has announced admission planning for universities and specialized colleges, with several new training domains, including environment, students are not applying for these disciplines. This situation might lead to a lack of qualified specialists in the near future and urgent measures to reverse this trend must be adopted.

Training of teachers

There is no dedicated environmental training programme for teachers. However, environmental modules have been gradually introduced as part of the regular training for teachers, which is carried out every five years. Initiatives for retraining teachers and assessing their professional level have been taken by the Ministry of Education and base curricula for continuous education were released in 2010. In spite of this progress, no specific reference to environmental education is made.

Apart from the work of the Ministry of Education, training activities for teachers are organized in the framework of various assistance projects by the Ministry of Environment through its specialized bodies or by dedicated NGOs.

Training and retraining of civil servants

In 2003, the Academy of Public Administration was subordinated directly to the President of the Republic of Moldova and its structure and education programmes aligned to international standards. To date, more than 4,000 people have graduated from the Academy as a bachelor or master of administrative sciences. Furthermore, 21,000 civil servants enrolled under various training and retraining programmes over the past 20 years. Environment-related courses were included as part of the training; however, a more systematic environmental programme is still lacking as part of the curricula.

Institutions under the Ministry of Environment, e.g. the SEI, also organize special training sessions on environmental education for both their own staff and relevant stakeholders. Training activities are also organized for public servants within various project frameworks but this remains unsystematic and donor related. A recent example is provided by the UNDP project assisting the NBS in the area of environmental statistics. Similar training activities were organized for the staff of the Ministry of Environment and subordinated structures for areas

such as water and sanitation, POPs, protected areas and emission inventories.

Education for sustainable development

There are no systematic activities in this area and no legal framework on ESD exists in the country. In spite of efforts made by the Ministry of Environment to develop a strategy for ESD jointly with the Ministry of Education, this objective is yet to be achieved. Under these circumstances, ESD is sporadic and mainly achieved at the initiative of NGOs and with support provided by international projects and programmes.

4.5 Conclusions and recommendations

The State Hydrometeorological Service (SHS) has, in recent years, become the centre of excellence for environmental monitoring and laboratory analysis supported by a functioning information and dissemination system. The Agency for Geology and Mineral Resources (AGMR), in its turn, has continued to operate almost unchanged for the past 20 years and faces increased difficulties in providing the Ministry of Environment with reliable information.

There is some progress in the process of harmonization with international standards, in particular for water (surface water, drinking water, etc.). Concerning air, the old standards are still in place but with a reduced number of parameters monitored and with additional parameters gradually introduced according to international standards.

The Ministry of Environment faces a great deal of difficulty in handling the environmental data and information it receives as it does not possess a dedicated unit able to receive and process all this information. There is no monitoring on noise and vibration in the country. Neither is there a monitoring system for biodiversity. There is no national environmental information system as such in the Republic of Moldova.

Recommendation 4.1:
The Ministry of Environment, in partnership with the relevant public authorities, should gradually develop an effective system of integrated environmental monitoring and information management at the national level, by applying the Shared Environmental Information System principles, and should secure funding from national resources and establish effective coordination to that end.

Concerning environmental data and their public accessibility, some progress is observed in recent years, in particular in electronic storage and dissemination. Leading in this area are the NBS and the SHS, with most of their information available online. The launch in 2011 of the Government's web portal, and its continuous development, is one of the achievements in terms of transparency, access to information and public awareness. All public institutions, the environment-related ones included, have websites, with a wide range of information available for the public. The common "look" of various websites and the use of similar IT applications make navigation easy and increases the usability of environmental information by the public at large.

Environmental reporting activities, with the exception of the national SoER, remain event driven and donor supported. There is no continuity or follow-up reporting in most cases and a lot of good and useful initiatives remain one-off exercises. The national SoER is primarily a scientific compilation rather than a policy-driven tool; therefore, its practical use remains limited. No regular information flows or databases are behind its preparation, the process having an ad-hoc character each time. Modern assessment tools such as indicators, scenarios or forward-looking studies are not used.

Recommendation 4.2:
The Ministry of Environment should transform the national state-of-the-environment reports into policy-relevant reports by the application of internationally agreed guidelines on the matter.

International assistance and national allocations from the environmental funds support various initiatives and projects concerning environmental education. Many NGOs throughout the country are active in the field of environmental education and related capacity-building activities. In spite of the efforts made by both the Ministry of Environment and Ministry of Education, a strategy for education for sustainable development has failed to materialize in the Republic of Moldova. The chances of having such a strategy in the future remain slim.

Recommendation 4.3:
The Ministry of Education and the Ministry of Environment should use the process of the development of a programme on environmental education and awareness-raising to start a debate, involving all stakeholders, including the mass media and non-governmental organizations (NGOs), on the priorities for the promotion of education for sustainable development (ESD) in the country.

PART II: DOMESTIC–INTERNATIONAL INTERFACE

Chapter 5

IMPLEMENTATION OF INTERNATIONAL ENVIRONMENTAL AGREEMENTS AND COMMITMENTS

5.1 Introduction

The Republic of Moldova is party to 18 multilateral environmental agreements (MEAs). The implementation of these MEAs has been pursued in various stages and at various paces, depending on the priority of the topic for the country, the availability of staff in the Ministry of Environment, the existence of a relevant office (e.g. Climate Change and Ozone Offices) and the availability of international resources to finance projects and implementation.

In 2005, the country also reconfirmed its commitment towards the implementation of the Millennium Development Goals (MDGs), although the results of a first report pushed the country to review the targets for some of the goals, notably for MDG7 "Ensure environmental sustainability".

The highest political priority is currently the approximation to the EU and the signing and then implementation of the EU–Republic of Moldova Association Agreement. The negotiations started in January 2010 and are expected to conclude by the end of 2013.

The environment-related work carried out by the Ministry of Environment in the context of the Association Agreement has reduced activities under other international frameworks. Conversely, the implementation of MEAs has benefited from the preparation of legislation to harmonize the country's legislative domain with the requirements of various EU environmental directives. In fact, the text related to the transposition of the EU directives is integrated with additional text that includes MEA requirements. However, this development does not apply for all MEAs. This could be, in part, because legislation that would be needed to implement a given MEA is actually under the responsibility of another ministry.

In order to harmonize national priorities and needs with international funds available through donors, in 2010, the country signed the Development Partnership Principles for Coordination and Harmonization of Government and Partner Practices for Enhanced Effectiveness of Foreign Assistance to the Republic of Moldova.

5.2 Institutional framework

The Ministry of Environment is responsible for the coordination of the implementation of MEAs to which the Republic of Moldova is a party, in conformity to the 2009 GD on Approval of the Regulation Regarding the Establishment and Operation of the Ministry of Environment, its Structure and Staffing.

A ministerial order (MO) nominates focal point(s) and outlines duties for each MEA. Focal points are generally officers of the Ministry of Environment. In a few cases, focal points are located in subordinated entities of the Ministry. This relates to the Danube River Protection Convention; the United Nations Convention to Combat Desertification in Countries Experiencing Serious Drought and/or Desertification, Particularly in Africa (UNCCD); and the Convention on the Transboundary Effects of Industrial Accidents. In others, e.g. the United Nations Framework Convention on Climate Change (UNFCCC), the focal point is the Minister of Environment directly. In addition to the nomination of focal points, for each MEA an interministerial working group is established, with the aim of ensuring coordination and cooperation between various entities involved in its implementation.

Seven offices have been created to support the implementation of specific MEAs: the Biodiversity, Biosafety, Carbon Finance, Climate Change, Environmental Pollution Prevention, Ozone, and Sustainable Management of Persistent Organic Pollutant (POPs) Offices. Their main aim is to develop investment projects and technical assistance, as well as to attract funding. In practice, these Offices have wider roles. They also cooperate in the day-to-day tasks deriving from the implementation of a particular MEA.

Since their creation (all either shortly before or after 2005), these offices have acquired importance for the

work required by the respective MEAs. They participate, and sometimes replace the Ministry of Environment, in the preparation of proposals for legislation or strategic and policy documents. When the Minister of Environment is the focal point for a specific MEA, or when no department dealing with a given MEA exists in the Ministry, the relevant Office (if there is one) has, in practice, the same role that the Ministry of Environment should have in the day-to-day implementation of the MEA.

In order to better coordinate national policies and needs with the international framework, the role of the State Chancellery has been enlarged. The State Chancellery was assigned a coordinating role in strategic and policy documents prepared in connection with international agreements or forums. The State Chancellery is responsible for coordinating the policy cycle and strategic planning, reviewing policy documents and ensuring that these documents follow the same template. The State Chancellery has also introduced a system for reporting on the implementation of the annual plans of line ministries, to gather information on all projects funded with international support. The reporting system is not yet accessible to the public.

The National Coordination Unit of the State Chancellery is responsible for negotiating and agreeing specific foreign assistance contracts; identifying new sources of foreign assistance and linking them with beneficiaries; coordinating the monitoring of foreign assistance projects at national level; and keeping the Interministerial Committee for Strategic Planning informed of planning, progress and any implementation issues related to foreign assistance projects. The Unit is the key interlocutor with development partners.

To ensure better coordination with and amongst donors, the State Chancellery also chairs monthly donor meetings under the Partnership Principles Implementation Plan that the country adopted in 2010. The Plan was signed by more than 20 countries and international organizations. It intends to ensure that the government and foreign partners work together in the most effective way to harmonize national needs and donors' priorities, and ensure ownership by the Republic of Moldova.

In the interests of transparency, the website of the State Chancellery reports information on major projects financed internationally and on MEAs to which the country is party. Despite these efforts, not all implementation plans, action plans or similar documents have been reported.

In 2005, the country adopted the National Action Programme on Capacity-building for Implementation of the Rio Conventions for the period 2006–2010. The majority of its elements were implemented. The Joint Interministerial Committee for Supervising the Implementation of the Rio Conventions was established, but currently it does not function.

5.3 Multilateral environmental agreements

The country generally complies with reporting on the implementation of MEAs. When reporting is complex, such as requiring specific scientific knowledge or data collected over a given period of time, the country relies mostly on foreign financial assistance. This is one of the instances where, without international assistance, the country would not be able to comply with its duties as a party to an MEA.

Biodiversity and landscape

The Republic of Moldova has been party to the Convention on Biological Diversity (CBD) since 1995, to the Cartagena Protocol since 2003 and to the Nagoya Protocol since 2012. The Ministry of Environment is the central national environmental authority responsible for the implementation of these MEAs.

In 2012, the country submitted to the CBD Secretariat the Action Plan for Implementing the Programme of Work on Protected Areas of the Convention on Biological Diversity. The Action Plan describes the situation in the country and highlights barriers or gaps to the effective implementation of the CBD. The main barriers identified in the Action Plan, apart the lack of secondary legislation to implement CBD requirements, are the unclear division of tasks between the Ministry of Environment and the Agency "Moldsilva" for the management of nature reserves. The Action Plan also presents actions up until 2020. According to the Plan, protected areas are expected to increase from their current 4.6 per cent of the country's total territory to 5.5 per cent.

The country is also one of the beneficiaries of a joint programme funded by the EU and implemented by the Council of Europe entitled Support for the Implementation of the Convention on Biological Diversity. Within this framework, the country participated in several workshops and seminars, following which it was able to identify several sites that would be eligible to be included in the Emerald Network, which is an ecological network to conserve wild flora and fauna and their natural habitats in Europe.

The Republic of Moldova is also party to the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). The country proceeded to further develop the necessary legislation, e.g. by introducing regulations providing administrative duties on import/export of animal and plant species. Several capacity-building activities and training were organized to tackle specific aspects, such as how to control shipments and permits. The training targeted customs employees. However, some difficulties remain from the implementation point of view for the customs control, mainly because the customs officers do not have appropriate instruments to carry out their checks, i.e. microchip readers and laboratories.

The country is party to the Ramsar Convention on Wetlands of International Importance especially as Waterfowl Habitat. For the management of the Ramsar Convention, in addition to having a dedicated working group as for the other MEAs, the country has created the Ramsar National Committee. The Committee is composed of high-level officials and decides on strategic aspects related to the Convention, e.g. the establishment of new protected areas. The Committee recently decided to establish the fourth Ramsar site in the country.

The last country report on the implementation of the Ramsar Convention highlights that private owners of the lands where some of the wetlands are located cannot comply with the requirements of the Convention on management of the sites. The lack of technical capacities and financial resources contribute to slowing down the implementation of the Convention. On the other hand, among the successes in implementing the Ramsar Convention, the country mentioned that the area of Ramsar sites reached 4 per cent of the total country area, that the Management Plan for the Lower Dniester had been adopted and that a Wetlands Day was organized annually.

Concerning the implementation of the Convention on Conservation of Migratory Species of Wild Fauna (Bonn Convention) and the Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention), the country has adopted new legislation and is participating in several initiatives. It is participating in a project together with Romania and Ukraine (2007–2013) that aims at creating a trilateral Danube delta biosphere reserve.

At the same time, monitoring is not carried out in the country although required by the Bern Convention (e.g. bird monitoring). Moreover, the legislative framework to implement the Convention is not yet complete; for instance, legislation on invasive species is lacking.

The country is party to the European Landscape Convention (Florence Convention) for which supporting legislation is under preparation. The legislation, if adopted, will fill the gap on classification and inventories of different sites. Implementing this legislation will be an issue, due to the lack of financial resources and capacities.

Climate change

The Republic of Moldova is party to the United Nations Framework Convention on Climate Change (UNFCCC) and the Kyoto Protocol. The country is considered under the Protocol a non-Annex I party and it is therefore eligible for activities under the Clean Development Mechanism (CDM). The Designated Competent Authority for the coordination of the activities is the National Commission for the implementation and realization of the commitments under the UNFCCC and of the mechanisms and provisions of the Kyoto Protocol. Four projects are currently being implemented in the Republic of Moldova under the CDM (chapter 6).

The Climate Change Office under the supervision of the Ministry of Environment is responsible for carrying out the communications with the Convention Secretariat and official reporting. The Office has also implemented a number of climate change projects since 2005.

A climate change adaptation strategy was drafted in 2011 and its approval by the government is still pending. The country is seeking funds from the Convention's adaptation fund, but to date it has not been able to conclude the accreditation process to become eligible for the fund.

Desertification

The Republic of Moldova is party to the United Nations Convention to Combat Desertification in Countries Experiencing Serious Drought and/or Desertification, Particularly in Africa (UNCCD). Since 2008, the country was supposed to prepare a new national action programme in line with the 2008–2018 strategy adopted in 2007 by UNCCD, but no programme has been prepared yet. In 2006, the country received support from UNCCD to prepare the national report on implementation. Cooperation with the UNCCD Secretariat also allowed the country's representatives to participate in several workshops.

Photo 5.1: Bread, basil and home-made wine

Waste and chemical management, and risk management

The Republic of Moldova has adopted new action plans for both the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal and the Stockholm Convention on Persistent Organic Pollutants. The country has ratified four amendments under the Stockholm Convention.

The Implementing Agreement between the Government and the NATO Maintenance and Supply Organization (NAMSO) for the destruction of pesticides and dangerous chemicals was signed in 2006. It allowed repackaging and transporting of 1,720 tons of pesticides and dangerous chemicals.

Since 2005, the Republic of Moldova has been party to the Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade. It provides one of the examples of the competences on chemicals being split between central authorities dealing with authorization and licensing, transport and disposal, and administration in case of emergency situations. Among such authorities are the Ministry of Environment, Ministry of Health, Ministry of Agriculture and Food Industry, Ministry of Economy and Commerce, Ministry of Transport and Roads Infrastructure, Ministry of Internal Affairs, Customs Service, Chamber of License and National Energy Regulatory Agency (ANRE). The splitting of responsibilities does not allow for the management of chemicals throughout their entire lifecycle.

The Republic of Moldova recently notified the Rotterdam Convention Secretariat of new submissions (17 pesticides and nine industrial chemicals). Since 2005, the country has participated in the activities organized for parties struggling to meet basic obligations under the Convention. No specific action plan was elaborated for the Rotterdam Convention, since its requirements are addressed in the action plan prepared for the Stockholm Convention.

Since 2005, the country has complied with reporting obligations under the Convention on the Transboundary Effects of Industrial Accidents. The country is benefiting from the Assistance Programme organized under the Convention to assist in the implementation of different parts of the Convention in those ECE countries with economies in transition. Under the Assistance Programme, the Republic of Moldova has prepared a self-assessment of its level of implementation of the Convention and is preparing an action plan to tackle the gaps discovered during the self-assessment. Some of the gaps concern the lack of a mechanism for consultation with neighbouring countries on hazardous activities with potential effects beyond the Moldovan border, the

need to enhance the knowledge of operators of hazardous activities of the content of safety documents, and the lack of a mechanism ensuring transboundary compatible emergency plans. The country has started to tackle some of the gaps through projects financed under the Convention. It is involved in a three-year assistance activity on hazard and crisis management in the Danube delta.

In the framework of MEAs dealing with chemicals, in 2008, the Strategic Approach to International Chemicals Management elaborated a country profile for chemicals management for the Republic of Moldova. This exercise was useful in identifying stakeholders involved in chemicals management. One of the major outcomes of the profile is that it is apparent there should be more cooperation among the authorities responsible for chemicals management. It also mentioned some of the limitations of the country in implementing the respective MEAs. Among the gaps identified were the lack of incentives needed to attract expertise and the lack of an effective mechanism for the collection of data on chemical substances (with the exception of those used in agriculture). The country profile recommended the creation of a national authority for chemicals management. The Ministry of Environment endorsed the suggestion and the creation of the national authority is foreseen in the law on chemicals expected to be adopted by the end of 2013.

The Ministry of Environment has started working to adapt the classification of chemicals to the Globally Harmonized System of Classification and Labelling of Chemicals.

Air protection and ozone layer

The country is party to the Convention on Long-range Transboundary Air Pollution. In 2011, the Convention's Implementation Committee found that the country was non-compliant with its obligations under the Protocol on Persistent Organic Pollutants (POPs) to this Convention, due to having exceeded its 1990 emission levels in 2008–2009. The country also failed to comply with the obligation to report data for 2005 and 2010 under the Protocols on POPs and on Heavy Metals. In its communication of 10 January 2013 to the Convention Secretariat, the country recognized its non-compliance with the obligation to report data and attributed it to the lack of institutional capacities and trained specialists.

In 2007, the Czech Republic funded a project on the elaboration of an action plan for the implementation of the Convention and its protocols in the Republic of Moldova (mainly the Gothenburg Protocol to Abate Acidification, Eutrophication and Ground-level Ozone). As a result, the national plan for implementation of the Gothenburg Protocol has been developed.

The Republic of Moldova is party to the Vienna Convention for the Protection of the Ozone Layer and the Montreal Protocol. It has ratified all the amendments to the Protocol, the last being the Beijing amendment ratified in 2006. Under the Montreal Protocol, the Republic of Moldova has the status of a developing country, which allows different timing for implementation. The national unit responsible for monitoring and coordinating all activities related to the phase-out of ODS is the Ministry of Environment. The focal point for coordination with the Convention Secretariat is a representative of the Ministry of Environment.

The basic legislative acts to implement the Vienna Convention were already in place before 2005. Since 2005, the country has adopted amendments to legislation to update it to changes in the requirements of the Convention over time. In 2007, the phase-out objectives were harmonized with the requirements of the Montreal Protocol set in the same year. The country has eliminated the use of chlorofluorocarbons (CFCs) in medical inhalers.

Water

The Republic of Moldova is party to the Helsinki Convention on the Protection and Use of Transboundary Watercourses and International Lakes (Water Convention) and participates in different activities organized under the Convention. For example, the country took part in a joint pilot project with Ukraine entitled Reducing Vulnerability to Extreme Floods and Climate Change in the Dniester River Basin. The project led to the assessment of the area's vulnerability to floods and the impact of floods. One part of the project was on improving water management and monitoring of the Dniester River. One of the outcomes of the project was the signature of the Agreement between the Government of the Republic of Moldova and the Cabinet of Ministers of Ukraine on collaboration on protection and sustainable use of the Dniester River basin in 2012.

The Republic of Moldova has also been involved since 2006 in the national policy dialogues (NPDs) in relation to the Water Convention programme. The NPDs support integrated water resources management. The dialogues resulted in policy packages adopted in 2009–2010, including a GD on wastewater discharges from municipal sources and an

order of the Agency "Apele Moldovei" on the establishment of river basin management authorities and river basin councils. The NPDs have boosted the work in the country under the Protocol on Water and Health. Targets have been developed under the Protocol, adopted in 2011, by a joint order of the Ministry of Environment and Ministry of Health.

The Republic of Moldova has been party to the Convention on Cooperation for the Protection and Sustainable use of the Danube River (Danube River Protection Convention) since 1999. In 2009, the International Commission for the Protection of the Danube River prepared a plan for the river's management and countries were invited to prepare their relevant national plans. The Republic of Moldova prepared its river management plan in 2012.

In 2010 the Republic of Moldova and Romania signed an agreement on cooperation for protection and sustainable use of the water of the Prut and Danube rivers.

Environmental impact assessment

The Republic of Moldova has been party to the Espoo Convention on Environmental Impact Assessment in a Transboundary Context since 1994. It is not party to the Protocol on Strategic Environmental Assessment to the Convention. Concerning the national legislation to implement the Convention, there are still a few inconsistencies related to transboundary EIA procedures and public participation. The draft legislation under preparation is expected to cover these gaps and, in addition, harmonize the national legislation with the relevant EU directive.

Public participation

The Republic of Moldova is party to the Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters (Aarhus Convention), and to its Protocol on Pollutant Release and Transfer Registers. The Republic of Moldova also accepted the GMO amendment to the Convention. The country actively participates in all the Convention's activities. In 2011 it hosted the fourth session of the Meeting of the Parties to the Convention.

The Aarhus Convention Compliance Committee found that the Republic of Moldova was not in compliance with the Convention and made recommendations, one of which involved the development and adoption of an action plan for the implementation of the Convention. At its fourth session in 2011, the Meeting of the Parties endorsed the findings and recommendations of the Committee (decision IV/9d). Thereafter, the National Action Plan was adopted on 28 June 2011, further to the recommendations of the Aarhus Convention Compliance Committee on issues of compliance raised by the International Environmental Association of River Keepers, ECO-Tiras. Since the decision from the Meeting of the Parties, the Republic of Moldova has reported every year to the Aarhus Convention Compliance Committee on the implementation of the Action Plan.

Dialogue and cooperation between the Ministry of Environment and NGOs have improved over recent years. Currently, NGO representatives are members of the administration councils of the national and local environmental funds and they participate in working groups for the implementation of various MEAs. Sometimes they are included in country delegations to major international events (such as the Rio+20 Conference in 2012).

Assessment of the implementation of MEAs

The level of implementation of the MEAs, and synergies and cooperation among them, do not seem consistent in the country. Despite the creation of interministerial working groups by ministerial orders (MOs), their functioning depends often on the availability of these members. The involvement of representatives from outside the Ministry of Environment is not as strong as it should be. MOs do not require a minimum number of meetings, so some working groups meet rarely.

MOs creating working groups for each MEA do not prescribe the exchange of information between the working groups. Theoretically, the exchange of information is done in writing with periodical reports that each focal point sends to the Ministry of Environment. In practice, it does not seem that synergies among the different MEAs are achieved. When synergies occur, it is because there is one unit taking care of MEAs of a similar nature (e.g. MEAs related to the protection of biological diversity, or MEAs related to chemical and waste management, with the exception of the Convention on the Transboundary Effects of Industrial Accidents). There seem to be very few contacts between working groups dealing with UNFCCC and the Vienna Convention, on the one hand, and the Convention on Long-range Transboundary Air Pollution on the other, or between UNFCCC and UNCCD. From information collected, it is not clear whether the Climate Change Office participates in or is aware of activities on tackling climate change implemented

under other MEAs. In many instances, the MEAs' focal points pointed out that better cooperation among the MEA secretariats themselves would be of help. Despite this, it would be useful for the focal points or the members of interministerial working groups to meet periodically (at least once per year) to share their experiences and information on ongoing activities.

The implementation of MEAs requires regular work on monitoring and sufficient management of resources. The lack of indication in the national legislation related to MEAs of relevant financial or staff needs has been hampering the implementation of MEAs.

Despite the nomination of focal points and the creation of interministerial working groups, sustainability is still an issue in the country. The rather high turnover of staff in the Ministry of Environment leads to frequent changes in the focal point of a given MEA. In some cases, the change of focal point has also meant that the authority/institution has changed. Because of a lack of institutionalization of the process, the passage of knowledge from one focal point to its successor is not always ensured, causing a considerable loss of knowledge and experience for the country. The fact that several new focal points changed the composition of the interministerial working group has also had consequences on sustainability.

The existence of an office to support the implementation of MEAs is another element that impacts on their implementation. Having the support of an external office increases the possibility of receiving support in the form of projects, in contrast to the situation where MEA implementation is only managed by one or a few persons in the Ministry of Environment. Financial or technical assistance significantly strengthen the practical implementation of a given MEA, even if financial support is frequently used to prepare extensive and specialized reports.

Currently, the existence of these offices is linked to the availability of project funds and this makes the situation rather unsustainable. On the one hand, the work in the country on a given MEA may stop should the relevant office be closed. On the other hand, to continue to exist, offices have a function based on projects which themselves are sometimes based on resources available, which, in their turn, are based on donors' priorities. This tends to create a situation in which, to ensure its survival, an office is bound to enter into projects that do not totally correspond to the priority needs of the country in that specific area. In addition, this could be a disincentive towards working on the sustainability of the results of previous projects, since an office (often composed of no more than three or four persons) has to prioritize its resources and look for new projects to ensure its financing.

5.4 Other multilateral processes

Sustainable development and Rio+20

The Republic of Moldova prepared and submitted a complete report to the Rio+20 Secretariat, analysing the situation in the country and outlining some plans for the way forward. According to the Rio+20 report, the country planned to develop the national "Green Moldova" trademark for products and processes, identify green companies receiving the right to use the "Green Moldova" trademark through transparent and fair selection, harmonize agricultural policy with industrial policy to stimulate multifunctional rural development and enable job creation for people leaving agriculture. No concrete actions have yet begun.

Some elements linked to sustainable development and green economy can be found in the draft national environmental strategy for the period 2012–2022. Its general objective is the promotion of sustainable development principles through the development of the green economy. The two mid-term development priorities are reducing energy consumption by increasing energy efficiency and increasing the use of renewable energy sources.

Millennium Development Goals

In 2005, the country prepared its First Millennium Development Goals Report (Table 5.1). In 2006, the Government launched a campaign to promote the MDGs and raise the public's awareness of the importance that each citizen contributes to the achievement of the country's development goals.

More specifically, one of the main focuses of MDG7 "Ensure environmental sustainability" has been water, through the implementation of water-related programmes, such as the Programme for the Provision of Water and Sewerage Systems in Local Communities of the Republic Moldova for the period up to 2015. However, even if data on access to water are improving, intermediate targets in this area could scarcely be met. For instance, despite the actions taken since 2007 on wastewater treatment stations, the proportion of the population with sustainable access to a sewerage system was 47.9 per cent in 2009.

Table 5.1: MDG implementation status

Target		Target by 2010 %	Target by 2015 %	Latest information available as of 1 July 2013 %
1.	Integrate principles of sustainable development into country policies and programmes and reduce degradation of natural resources. Increase forested area from 10.3 per cent in 2002	12.10	13.20	11.00
2.	Increase the share of protected areas to preserve biological diversity from 1.96 per cent in 2002	4.65	4.65	4.58
3.	Increase the proportion of the population with permanent access to safe water sources from 38.5 per cent in 2002	59.00	65.00	53.00
4.	Increase the proportion of the population with permanent access to improved sewerage from 31.3 per cent in 2002	50.30	65.00	47.90
5.	Increase the proportion of the population with access to sanitation systems from 41.7 per cent in 2002	51.30	71.80	45.90

No data were available for the period after 2009, but the dynamics of this indicator suggest that the intermediate target (51.3 per cent by 2010) and final target (71.8 per cent by 2015) may be left unaccomplished.

Since 2006, the Republic of Moldova has revised all the targets set under MDG7, with the exception of afforestation. The main reason behind this revision is the slow progress in reaching the targets set. With regard to the target for afforestation, as the share of forested areas in 2006 was very close to the intermediate target for that year, the original targets for 2010 and 2015 were considered to remain valid.

5.5 International cooperation and assistance

The country has signed 13 bilateral environmental agreements, mainly with Central European and Baltic countries (e.g. the Czech Republic, Estonia, Latvia and Poland). It also participates in environmental programmes with other countries, such as the Black Sea Joint Operational Programme for the period 2007–2013 and the Joint Operational Programme Romania–Ukraine–Republic of Moldova. The latter programme aims to create a bridge among the three partner countries in order to support border area communities in finding common solutions to similar problems that they face. Local authorities and other organizations in the border areas are encouraged to collaborate in the development of solutions to environment-related problems, such as strengthening preparedness for emergencies. The Programme also promotes better interaction between communities in the border areas.

European Union

In 2010, the Republic of Moldova started negotiations towards signing an Association Agreement with the EU. One of the chapters of the Agreement concerns Environment. Negotiations for the Agreement foresee that the Republic of Moldova will start a programme for regulatory approximation with the EU. As such, the country has prepared a draft chapter on Environment containing parts of European directives related to the environment that the country would commit to transpose and implement.

In 2007 the European Neighbourhood Policy and its financing instrument (ENPI) replaced the TACIS programme[3] as an instrument for providing, inter alia, technical assistance to the countries with economies in transition neighbouring the EU. The Republic of Moldova is benefiting from the ENPI projects concerning environmental issues.

The Republic of Moldova is a party to the Black Sea Synergy, a regional cooperation initiative covering the Eastern ENPI countries as well as the Russian Federation and Turkey. The Black Sea Synergy is an EU sea basin initiative through the creation of partnerships among the countries involved. Among the sectors in which partnerships were created are climate change (and support to the implementation of the relevant international agreements) and sustainable development.

During 2007–2013, EU assistance to the Republic of Moldova focused on good governance and the rule of law, social and human development, and trade and sustainable development. The latter also comprises environmental protection and energy efficiency. The total financial envelope for the period amounts to €483 million, of which €272 million were for 2011–2013. Of the latter, some €100 million (35 to 40 per cent of the total) is allocated to the area "Trade and

[3] Council Regulation (EC, Euratom) No. 99/2000 of 29 December 1999 concerning the provision of assistance to the partner States in Eastern Europe and Central Asia.

sustainable development". There is no published specific allocation of funds for environmental protection, but the priority areas include, notably, water quality improvement, industrial pollution, waste management and the implementation of MEAs. Considerable funds (€50 million) have been made available for the rehabilitation and extension of water and sewerage systems. Moreover, the European Investment Bank (EIB) has provided loans for the upgrading of the transport, energy and municipal infrastructure, including the water sector.

European Bank for Reconstruction and Development

Apart from promoting the investment climate for the private sector, the EBRD has co-financed (in cooperation with the EIB) loans for the rehabilitation and modernization of the transport and municipal infrastructure. The Bank has also promoted the improvement of energy efficiency. In 2011, the Bank and the Government signed the Sustainable Energy Action Plan, which provides a framework for measures designed to improve the environment for sustainable energy investments in major sectors of the economy. In 2010 the Bank launched the Moldovan Sustainable Energy Financing Framework, which has a financial envelope of €20 million aimed at financing energy efficiency projects implemented by domestic private companies.

Global Environment Facility

The Global Environment Facility (GEF) has, since 2006, co-financed with grants a number of projects, mainly in the areas of biodiversity, management and destruction of POPs, and climate change, viz. the reduction of GHG emissions by means of improved energy efficiency in the industrial sector of the Republic of Moldova. The aggregate grants provided amount to US$10 million.

World Bank

The World Bank has provided loans to the Republic of Moldova in a large number of sectors, such as energy, climate change mitigation and adaptation risk management, and the water supply and sanitation sector. These loans were partly co-financed by the GEF.

Among the currently active environmental projects are the Disaster and Climate Risk Management Project with the objective of strengthening the ability of the State Hydrometeorological Service to forecast severe weather and predict natural disasters. There is also a pilot project on the use of animal manure for biogas and electricity generation on farms, based on innovative, environmentally friendly technology. The Bank also supports a forest development project which has the objective of restoring degraded land to economic and environmental use for the benefit of rural communities.

Austrian Development Cooperation

The Austrian Development Cooperation has committed a grant for a project designed to construct a sustainable water supply infrastructure in the district of Nisporeni. The project started in 2011, and the committed funds amount to €3.5 million.

Czech Development Agency

Assistance to the Republic of Moldova provided by the Czech Development Agency of the Ministry of Foreign Affairs covers the areas of water supply and sanitation, and environmental protection (liquidation and reduction of environmental hazards). Overall grant and technical assistance amounted to €8 million during 2006–2010 and is projected to be some €10 million during 2011–2104.

German international cooperation

Through the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ), Germany provides support to selected local authorities in the Republic of Moldova in the modernization of municipal services, i.e. water supply and sanitation, waste management and energy efficiency, with a major focus on economic efficiency as well as improved environmental performance. The total budget of German international cooperation for the Republic of Moldova is €5.5 million.

Romanian development assistance

Romania provided funding (€500,000) for a water supply and sanitation project in rural areas within the framework of a cooperation arrangement with GIZ that has been in place since 2010. In 2012, financial support was provided for the establishment of a laboratory designed to determine the level of pesticides in plants, soil and vegetable products, in order to increase food safety.

Swedish International Development Cooperation Agency

The Swedish International Development Cooperation Agency (SIDA) has in recent years put strong emphasis on supporting the Republic of Moldova in its efforts to adapt to EU norms and standards in the

area of energy efficiency and the development of renewable energy resources. Sweden has, notably, supported the establishment of the Energy Efficiency Agency and the Energy Efficiency Fund as well as the development of a long-term strategy for 2013–2030 designed to ensure energy security, including financial resources for associated investments. Since the end of 2011, the Agency has been co-financing the development of integrated infrastructure plans that are designed to improve municipal service provision.

Swiss Agency for Development and Cooperation

The Swiss Agency for Development and Cooperation (SDC) has focused on the development of the water sector in the Republic of Moldova, with the main emphasis on the construction of decentralized water supply and sanitation systems. A project launched in 2009 focuses on the capacity-building of local administrations, the private sector and communities concerning the design and implementation of water supply and sanitation investment projects. The project has a budget of about 10 million Swiss francs (approximately €8 million), including co-financing from the Austrian Development Cooperation. The Agency is the major bilateral donor in the water supply and sanitation sector of the country.

USAID/Millennium Challenge Corporation

The U.S. Agency for International Development (USAID) and the Millennium Challenge Corporation have mainly focused on support for the transition to high-value-added agriculture in the Republic of Moldova (chapter 10). A corresponding programme, signed with the Government of the Republic of Moldova in 2010, provides grants amounting to US$262 million for five years.

Besides the development of the road infrastructure, a major component is the repair of large irrigation systems as well as technical assistance for the establishment of water user associations to efficiently manage and operate these systems, including the development of the necessary legal and institutional framework for financial sustainability of the irrigation sector.

5.6 Conclusions and recommendations

The implementation of MEAs in the Republic of Moldova is strongly dependent on international financial support. Seven offices were established to support the implementation of various MEAs. However, their role is wider and they participate with, and often replace, the Ministry of Environment in developing strategic documents.

Recommendation 5.1:
The Government should take over the responsibilities for implementation of multilateral environmental agreements (MEAs) and, upon consent with the donor community, integrate the existing offices for the implementation of MEAs into the recommended Environmental Protection Agency.

The country shows some progress in the preparation of the legislative framework to harmonize its legislation with the international regime, in particular with the MEAs to which the Republic of Moldova is party. The draft laws on water, environment and chemicals are examples. On the other hand, this progress is not as evident in the implementation of the policies and legislation adopted for the implementation of the MEAs.

Recommendation 5.2:
The Government should:

(a) Ensure the sustainability of policies adopted to implement the MEAs to which it is a party;
(b) Assess the needs, costs and benefits of other relevant MEAs before joining them so as to be able to commit the necessary resources for their sustainable implementation.

Since 2005, the Republic of Moldova has moved towards increased coordination of its environmental policies with the implementation of MEAs. In addition, the country has put efforts into streamlining the approval of project proposals or implementation plans prepared under different international agreements and forums. Despite the efforts made so far to increase internal cooperation and coordination among the authorities, information sharing is still weak. This is also the case when it comes to sharing information between different departments in the Ministry of Environment.

Recommendation 5.3:
The Ministry of Environment should:

(a) Build synergies among working groups coordinating the implementation of the MEAs;
(b) Facilitate direct communication between staff of the Ministry of Environment who are in charge of the implementation of MEAs and scientific institutions, including subordinate bodies.

Chapter 6

CLIMATE CHANGE ADAPTATION AND MITIGATION

6.1 Introduction

The Republic of Moldova has ratified the United Nations Framework Convention on Climate Change (UNFCCC) and the Kyoto Protocol. As a non-Annex I party, the country has no commitments to reduce GHG emissions under the Kyoto Protocol. Since 2005, the most important developments in the Republic of Moldova regarding climate change are the preparation of the Second National Communication, the negotiations since 2010 of an Association Agreement with the EU that contains a chapter on climate change and the country's ratification of the Energy Community Treaty[4] in 2010.

In terms of the country's emissions, the country's First and Second National Communications to UNFCCC show a dramatic decline in GHG emissions in the period 1990–2005. This general trend conceals the fact that total GHG emissions started increasing in 2000. Recent data up to 2010 contained in the country's draft 2013 national inventory report show that total GHG emissions grew by more than 20 per cent in the decade 2000– 2010. The growth was more moderate, about 3 per cent, after 2005, mostly due to the economic downturn (see annex I). This trend seems to reflect the general pattern of economic growth in the country during these 10 years, which, for the most part, has been uneven: for example, GDP grew annually by 7.1 per cent in the period 2000–2004 and by 5.2 per cent in the period 2005–2008.

6.2 Current and foreseeable economic and environmental impacts from climate change

According to a range of studies, including the Republic of Moldova's Second National Communication and the 2009 National Human Development Report, impacts of climate change are expected to intensify as changes in temperature and precipitation affect economic activity. The Republic of Moldova is considered highly vulnerable to climate variability and change. Socioeconomic costs of climate-related natural disasters such as droughts, floods and hailstorms are significant, and both the intensity and frequency of such events are expected to further increase as a result of climate change. Socioeconomic vulnerability to these events and their aftermath is high given that the Republic of Moldova is one of the least advanced countries in the Europe and Central Asia region; in 2011, it was ranked fourth-lowest on the Human Development Index among 30 countries in the region.

Agriculture

The impacts of climate change on agriculture are of particular concern because agriculture is a major source of income and employment, with about one third of the labour force employed in the sector. During the period 1984–2006, average annual economic losses due to natural disasters were about 2.1 per cent of GDP, estimated at US$61 million. However, impacts since 2006 have been more severe. Droughts in 2007 caused estimated losses of about US$1 billion. Estimated losses from droughts in 2012 went even higher, to US$1.25 billion. Total damage and losses due to floods in 2008 were estimated at US$120 million, of which US$18 million concerned agriculture. Floods in 2010 caused damage, primarily affecting rural and agricultural regions of the country, which was estimated at approximately US$42 million.

The severe droughts of 2007 and 2012 showed that climate change could seriously undermine the Republic of Moldova's food security. They impacted on more than 80 per cent of the rural population depending on agriculture. Output of cereal crops dropped more than 60 per cent compared with 2006, and the wheat harvest diminished by some 40 per cent. Animal livestock dropped dramatically as well, between 2006 and 2008: bovine dropped by one quarter, pigs by some 45 per cent, sheep and goats by 10 per cent and poultry by 25 per cent.

[4] The Energy Community is established between the EU and a number of third countries to extend the EU internal energy market. Under the Energy Community Treaty, the Contracting Parties commit to implementing the relevant EU *acquis communautaire*, to adapting their regulatory framework and to liberalizing their energy markets.

Photo 6.1: Consequences of flooding on Dniester River in summer 2008

Projected climate trends are likely to have a negative effect on wheat yields that are essential for food security, but also on the economically important vineyards. Small farms are the most vulnerable and these trends will probably push more rural families into poverty and further intensify migration away from rural areas to the types of extreme climate conditions expected to become more frequent and severe with climate change. The provision of irrigation in appropriate areas within these two zones would provide significant benefits even under current conditions, potentially increasing yields by 1.5 to two or more times as compared with yields without irrigation.

Transportation

Climate-change-induced higher temperatures and extreme weather events have the potential to impact upon multiple transport modes. Concerning road transport, little investment in road infrastructure has been made in the last two decades. Heat waves would further damage the already poor quality asphalt pavement of national roads. Concerning rail transport infrastructure, heat waves could cause deformation of the already old railroad lines and accelerate the physical decline of infrastructure such as bridges. In terms of vehicles, the need for heat-resistant engines and air cooling will increase. Still more critically, climate change is set to significantly constrain the development of naval transport which is also envisaged by the strategic framework for development of the transport network. Extreme events will also carry the potential to disrupt transportation flows to rural areas.

Energy

Climate change will likely affect the energy distribution infrastructure because of more frequent and more violent extreme weather events that may damage supply grids. The patterns of demand will change and, given current capacities, increasing demand in the summer could strain transmission lines, due to spikes in demand for electricity to power air-conditioning equipment. On the other hand, to the extent that winters will become warmer, heat energy demand can be expected to decrease.

Biodiversity

The projected climate variability is likely to have significant impacts on biodiversity. Rising temperatures will force the migration of species to cooler areas and the arrival of new organisms. However, some flora and fauna species could be threatened due to their low resilience to temperature and precipitation changes.

Forests and aquatic species are highly vulnerable to climate variability, especially in the southern and

eastern parts of the country that are currently semi-arid but could become arid in the future.

6.3 Sectoral policies

Energy

The energy sector is essential for the Republic of Moldova's economic development, while at the same time remaining its main source of GHGs. More than 95 per cent of the country's energy needs are covered by energy imports. This dependency has resulted in rises in domestic energy prices and in large external debts. These realities have led the authorities to set ambitious targets for the diversification of the country's energy resources, while increasing energy security and attracting investments along the way. Specifically, the aim of the 2013 Energy Strategy of the Republic of Moldova until 2030 is to increase the share of renewable energy to 20 per cent of energy generation in the country by 2030.

A major obstacle to implementing renewable energy policies is the high cost of producing energy from renewable sources. Although the legal framework for renewable energy has been created, no feed-in tariffs have been introduced, thus hindering the attainment of objectives related to renewable energy sources as set out in the Energy Strategy of the Republic of Moldova until 2030 and the NDS 2012–2020. The experience from introduction of feed-in tariffs in other countries has been mixed, mostly due to excessive response to the incentive. It is a fact, however, that feed-in tariffs is a measure that can greatly facilitate investor decisions by making predictable the price structures associated with electricity produced from these sources.

As an agricultural country, the Republic of Moldova has high volumes of agricultural waste. Thus, the country's primary focus in this strategic direction is on biomass, which is one of the most secure and easily accessible alternative sources, and which is enough to cover 20 per cent of the total annual energy consumption in the country, as various studies show. At the same time, one has to be cautious due to wide fluctuations in agricultural production due to climate variability in the country.

Recognizing this potential, the international donor community has been supporting projects based on biomass in the country. For example, the GEF/World Bank project Renewable Energy from Agricultural Waste, implemented between 2005 and 2008, supported the installation of 11 heating biomass installations in rural communities. As a follow-up to this project, the EU and UNDP launched in 2011 a technical assistance project worth €14 million to support the adoption of biomass district heating in public sector buildings in rural areas through the installation of 130 straw-fired boilers. The project also supports the creation of 500 efficient home heating systems in rural areas.

Energy efficiency

Efforts on energy generation are coupled with efforts on energy efficiency, where the Republic of Moldova has placed considerable emphasis. As a result, the institutional and policy frameworks are quite developed.

Consumption by the transport sector increased by 116 ktoe (43 per cent) between 2005 and 2011. On the other hand, following a rather different trajectory, energy consumption by the agricultural sector declined by 26 per cent in the same period (table 6.1).

Table 6.1: Energy and fuel resources, ktoe

	2005	2006	2007	2008	2009	2010	2011
Total	**2,463**	**2,430**	**2,358**	**2,410**	**2,312**	**2,401**	**2,442**
Distribution	2,278	2,271	2,160	2,191	2,071	2,209	2,237
Energy transformations	842	817	767	764	716	737	717
Consumption by sectors							
Industry and construction	161	163	156	142	85	107	118
Agriculture	61	59	52	51	46	48	45
Transport	267	285	325	336	291	358	383
Trade and communal facilities	120	123	119	120	172	157	157
Households	704	691	598	632	660	689	708
Other sectors	123	133	143	146	101	113	109
Exports	3	4	7	5	15	18	14
Stocks of fuel, end of the year	182	155	191	214	226	174	191

Source: Statistical Yearbook of the Republic of Moldova, 2013.

Currently, the main document dealing with energy efficiency is the National Energy Efficiency Programme (NEEP) for 2011–2020, approved by the 2011 GD No. 833. Its main objective is to diminish dependency on imported energy resources and the energy sector's impact on climate changes. Specifically, with 2009 serving as the baseline, the NEEP seeks to increase the efficient use of overall primary energy by 20 per cent by 2020. It also seeks to cut GHG emissions by at least 25 per cent by 2020 relative to a 1990 baseline. The NEEP proposed a system of regulated tariffs for the supply of electricity that gives incentives to dealers to reduce electricity losses in distribution networks, thus reducing GHG emissions. It also proposed a National Communication Strategy in order achieve behavioural changes from consumers, through awareness campaigns encouraging people to use energy rationally and to sensitize them on the energy consumption dimension of choices concerning materials and equipment of everyday life, from buildings to household appliances.

The NEEP is supported in its implementation by three-year national action plans for energy efficiency. Thus, to achieve the NEEP objectives, the National Energy Efficiency Action Plan for 2013–2015 was adopted in 2012. The objective of the Action Plan is to reduce the energy end-use in all national economy sectors by 428 ktoe, and cut emissions of CO_2 by 962,848 tons during 2013–2015. Beyond 2015, the Action Plan aims to double energy savings to 867 ktoe by 2016, with the reduction of GHG emissions of almost 2 million tons of CO_2 (table 6.2).

Table 6.2: Energy savings targets

	2013–2015		2013–2016	
Sectors	**ktoe**	**%**	**ktoe**	**%**
Energy	57	13	116	13
Industry	43	10	87	10
Transport	98	23	200	23
Services	37	9	75	9
Households	193	45	390	45
Total	**428**	**100**	**867**	**100**

Source: National Energy Efficiency Action Plan for 2013–2015.

Transport

In the transport sector, the 2008 Land Transport Infrastructure Implementation Strategy for 2008–2017 aims to improve road infrastructure and therefore reduce fuel transportation units.

The aim is to increase the share of biofuels to at least 10 per cent of all fuels used in the transport sector by 2020, with an interim target of 4 per cent by 2015. The overall aim is to reduce by 2020 GHG emissions from mobile combustion of fossil fuels (in domestic aviation, road, rail, inland waterway and pipeline transport) by at least 30 per cent compared with their 1990 levels.

Adopted measures include the prohibition by law of the importation of cars, vans, trucks and buses that have been in operation for more than 10 years, with the aim to renew the vehicle fleet with less polluting and more energy efficient new vehicles. Other measures include the rehabilitation and development of land transport infrastructure, although such measures will require large-scale investments in roads and rail modernization. Furthermore, starting in 2013, EU regulations for flights between the Republic of Moldova and EU member States are also valid for the Republic of Moldova, so the aviation sector will be included in the mandatory EU emissions trading scheme. This means that all airlines flying to and from the EU are required to offset flight emissions by buying emission permits and/or certified emission reduction credits.

Industry

The Industry Development Strategy for the period 2006–2015 foresees structural reform in the industrial sector with the aim to encourage the rational use of natural resources by economic agents and the promotion of environmental protection. The envisaged policy concerning the industrial sector is to reduce energy intensity by 10 per cent by 2020. The aim is to reduce total emissions of GHGs from industry by 2020 by at least 25 per cent compared with 1990 levels. The NEEP stipulates that the government should encourage industries to invest in energy efficiency by creating favourable tax incentives and funding. It is not clear to what extent these stipulations have materialized and what their actual impact has been.

The NEEP also provides some measures focused on improving energy efficiency in industry, including voluntary agreements for the implementation of energy efficiency measures to reduce energy demand, government-backed credit facilities for the energy industry, and support and monitoring by the Energy Efficiency Agency.

Agriculture

For the agricultural sector, the aim is to reduce by 2020 GHG emissions by at least 30 per cent

compared with their 1990 levels. The 2008 National Strategy for Sustainable Development of the Agro-industrial Sector for the period 2008–2015 provides a series of measures aimed at combating land degradation through afforestation and creating new vineyards and orchards, which may have an impact on the level of carbon sequestration and reduce GHG emissions.

The 2011 National Programme for Conservation and Improvement of Soil Fertility for 2011–2020 provides for measures to prevent soil erosion by restoring green manure for soil protection, afforestation of degraded, highly eroded sloping grassland, and promotion of the cultivation of grassy crops between rows in orchards and vineyards. The programme has a number of other measures that contribute to reducing GHG emissions, such as using manure, incorporation of plant residues in soil, reducing nitrogen fertilizers and crop rotation.

The direct contribution of forestry to the reduction of GHG emissions is envisaged through carbon sequestration. The aim is to expand wooded areas by about 150,000 ha between 2003 and 2020 through regeneration and expansion of areas covered with forests. In 2003, forests and other wooded land covered 404,500 ha; in 2005, this figure had increased to 412,000 ha and in 2012 it reached 423,710 ha. So, in the first 10 years, wooded areas increased by less than 20,000 ha, which is slightly more than one eighth of the actual target for 2020. It should be added here that the area under regeneration, which is not included in these figures, covered 31,530 ha in 2003, dropped to 30,820 ha in 2005 and increased to 50,470 ha in 2012.

6.4 Policy framework

So far, there is no national strategic framework on climate change mitigation and adaptation, although some sectoral strategies of climate change relevance have been developed. Without such a framework it is hard to envisage how an effective and coherent climate change adaptation policy can be implemented. The development of an adaptation strategy (the national climate change adaptation strategy) and a mitigation strategy (the low emissions development strategy) was begun in 2010 with the aim to address this major gap in the country's policy framework. However, the development of these two strategies was still ongoing in 2013.

The Ministry of Environment has been actively engaged in negotiations on the chapter of the EU Association Agreement related to climate change. This chapter covers mitigation of climate change, adaptation to climate change, carbon trading, development of relevant technologies, mainstreaming of climate considerations into sector policies, and awareness-raising, education and training. As part of its obligations under the Association Agreement, the Republic of Moldova commits to approximate its legislation to relevant EU instruments on climate change. For instance, within five years from the entry into force of the Association Agreement, the Republic of Moldova commits to establishing a system for monitoring fuel quality and a system to collect national fuel quality data.

Draft strategic documents

Draft low emissions development strategy

The draft low emissions development strategy (LEDS) includes a descriptive part analyzing general trends and an analytical part that discusses mitigation challenges in key sectors of the Republic of Moldova.

The draft LEDS makes an in-depth assessment of challenges faced by the country in its efforts to promote a low-carbon-driven economy. In the energy sector, aspects of financing and technology transfer are identified as the main limiting factors for improvements in the efficiency of thermal power plants. Financing the large capital investment required for these technologies is inadequate. According to the draft strategy, most measures aimed at reducing GHG emissions at the source require investments that lead to increased energy prices, when energy prices are already very high for the median end-user.

At the same time, interest rates are very high. Foreign loans are considered high risk, thus preventing easy access to foreign credit. High investment costs of renewable energy technologies represent a major obstacle to expansion of renewable energy sources in the country.

There are great opportunities regarding energy efficiency in residential buildings, given the generally high level of energy prices. Appropriate incentives together with raising awareness of the potential benefits could bring about adequate demand for this type of investment. On the supply side, few small businesses in the construction sector have access to suitable training in these types of technologies and standards. Addressing limited access to capital markets for low-income households and lack of technical know-how and available technologies would considerably counter delays in the process.

The transport sector is responsible for the largest increases in GHG emissions and is projected to continue to be so in the future. Reducing GHG emissions from the transport sector would require the introduction of new technologies, changes in transport planning and infrastructure, and transition to low-carbon fuels. Improving the energy efficiency of vehicles would require the application of a combination of regulatory tools (vehicle efficiency standards) and potential economic incentives for the substitution of the obsolete vehicle fleet with less polluting and more efficient vehicles. Infrastructural improvements would require major investments.

According to the draft LEDS, studies of marginal costs of emission reduction and calculations for energy efficiency end-use effects are limited. On the basis of the above, mitigation options that are optimal in the sense that they combine economic efficiency with mitigation are as follows:

- Rehabilitation of power generation capacity by upgrading and improving plant efficiency;
- Increasing the efficiency of the electricity transmission infrastructure;
- Increasing energy efficiency in end-use energy consumption, although without explicit targets;
- Development of renewable energy resources such as biomass.

The objectives of the draft LEDS are to:

- Reduce by 2020 total GHG emissions from the energy sector by 25 per cent compared with 1990 levels;
- Increase the share of biofuels to at least 10 per cent of all fuels used in the transport sector by 2020, with an interim target of 4 per cent by 2015;
- Reduce by 2020 total GHG emissions from industry by at least 25 per cent compared with 1990 levels;
- Reduce by 2020 total GHG emissions from agriculture by at least 30 per cent compared with 1990 levels;
- Increase by 2020 the total capacity of carbon sequestration in the sector Land use, land use change and forestry (LULUCF) by at least 30 per cent compared with 1990 levels;
- Reduce by 2020 total GHG emissions from the waste sector by 15 per cent compared with the baseline scenario.

Given the dramatic decline in GHG emissions by more than 70 per cent between 1990 and 2005, it is clear that some of these targets have been achieved by virtue merely of the restructuring that followed the transition period that the Republic of Moldova experienced.

Draft national climate change adaptation strategy

The draft national climate change adaptation strategy is intended to serve as an umbrella strategy to create an effective enabling environment for the integration of climate change concerns in sectoral strategies and action plans.

The draft document is based on analysis of the current situation and vulnerabilities. It prioritizes areas and sectors although it does not appear to integrate sectoral strategies. It includes a list of actions for the achievement of its objectives.

However, to the extent that this document purports to becoming the country's national adaptation strategic document, it has a number of weaknesses. First, its time horizon is only five years and the total cost for the implementation of actions is only US$2.5 million. Thus, it appears to be a low-level document, not one that will frame the country's adaptation efforts.

Additionally, the document places disproportional emphasis on communication aspects. Although these are important, they cannot substitute for important changes in the way the country's economic agents operate to strengthen the resilience of the Moldovan economy. A lot of complex tasks are not clearly assigned: the term "central public authorities" appears all too often as being responsible for actions on building climate resilience through reducing risk and facilitation of adaptation in priority areas.

6.5 Institutional framework

Ministry of Environment

The Ministry of Environment is in charge of implementation of obligations emanating from the UNFCCC and the Kyoto Protocol. The Minister also acts as the UNFCCC focal point.

State Hydrometeorological Service

The State Hydrometeorological Service (SHS) forecasts and issues warnings related to meteorological, hydrological and agrometeorological hazards. It operates and maintains a system of observation posts and stations. It also provides climate-related data that are used in national communications.

Climate Change Office

The Climate Change Office (CCO) is a project implementation office that was established in 2004 by MO No. 21, with the aim to implement UNFCCC and the Kyoto Protocol commitments. Although the CCO is under the aegis of the Ministry of Environment, none of its staff members are financed by the State budget. Rather, all activities and salaries are covered by project funding.

The CCO has two main tasks. First, it provides logistical support to the government, central and local public administration authorities, NGOs and academic organizations, for activities implemented and promoted by the Republic of Moldova under the UNFCCC and Kyoto Protocol. The CCO is responsible for the activities related to preparation of national communications and national inventory reports. Within the CCO, the National Inventory Team is responsible for estimating emissions by categories of sources and removals by categories of sinks, key sources analysis, quality assurance and quality control procedures, uncertainties assessment, documentation, and reporting and archiving of data related to the GHG inventory preparation process.

Second, the CCO implements climate-change-related projects related to GHG emissions evaluations and the preparation of national inventory reports, and is responsible for the development and implementation of GHG emissions mitigation activities, development and implementation of measures aimed at adapting to climate change, assessment of the climate change impact on environment and socioeconomic components, and the Clean Development Mechanism (CDM) of the Kyoto Protocol. It also builds awareness and disseminates information among civil society, relevant experts and decision-makers on climate-change-related issues.

So far, tthe CCO has coordinated the preparation of the First and Second National Communications to the UNFCCC. At the time of the EPR review, an advance draft of the Third National Inventory Report was in the process of final approval and adoption.

State Chancellery

Indirectly, the State Chancellery has a central place because it coordinates all governmental strategies, programmes and plans. In principal, all forms of international aid, including those concerning climate change actions, are no longer channeled through line ministries and agencies but through the State Chancellery (chapters 1 and 5).

National Commission for the implementation and realization of the commitments under the UNFCCC and of the mechanisms and provisions of the Kyoto Protocol

The National Commission was created in 2003 by GD No. 1574. It is chaired by the Minister of Environment. The Director of the State Hydrometeorologial Service is its Vice-chair, and the Manager of the Climate Change Office is its Secretary.

Members of the National Commission include representatives of specialized parliamentary commissions, at the level of vice-chairs; directors from relevant ministries such as the Ministry of Environment, Ministry of Economy, Ministry of Finance, and Ministry of Transport and Roads Infrastructure; and the Directors of the Academy of Sciences and Forest Research and Management Institute.

As outlined in annex 2 to GD No. 1574, the National Commission is the supreme national authority which coordinates the activities on the implementation of the Republic of Moldova's commitments under the UNFCCC and the Kyoto Protocol. The National Commission is also responsible for the elaboration and implementation of climate change mitigation and adaptation policies and strategies. In this sense, it appears that the mandate of the National Commission and that of the Interministerial Working Group on Climate Change potentially overlap. So far, there is no evidence that the National Commission fulfils its role on policy formulation as envisaged in GD No. 1574.

Despite the fact that the National Commission is supposed to have a very wide role in the coordination and implementation of commitments related to the UNFCCC and the Kyoto Protocol, in practice, its mission has been interpreted in a very restrictive way and it currently operates only in relation to CDM projects. Given the relatively high-level composition of this body, this is rather surprising.

The key national authority in this regard is the Designated National Authority (DNA) on CDM, whose main function is to assist the realization of CDM projects in the country, through their approval at national level and their submission and registration by UNFCCC's Executive Board on CDM within the UNFCCC Secretariat. The Ministry of Environment is the DNA of the Republic of Moldova.

Interministerial Working Group on Climate Change

The Interministerial Working Group on Climate Change was created by MO No. 87 of the Ministry of Environment in 2010 with the purpose of elaborating and reviewing the country's national climate change adaptation and mitigation strategies. The group is chaired by the Vice-Minister of the Ministry of Environment, and the CCO holds the position of the Secretariat. The Working Group consists of 25 members outlined in the annex to the MO, including the State Chancellery, various relevant line ministries and agencies, and research and academic institutes. The meetings of the Working Group were envisaged to be held as needed, upon the request of its members. Indeed, the Working Group appears to have met twice, in 2011 and in 2012. The Working Group may establish sectoral subgroups, although there is no evidence that such subgroups were created.

National Commission for Emergency Situations

The National Commission for Emergency Situations is the main coordinating body dealing with preventive risk-reduction and post-emergency interventions, including extreme weather events such as floods. Because of the extreme events (droughts and floods) in the period 2007–2010, the National Commission was strengthened. Disaster relief and recovery operations are the mandate of the State Service for Civil Protection and Exceptional Situations, which has been part of the Ministry of Internal Affairs since 2004.

Assessment

In institutional terms, it appears that no climate change policy formulation functions are performed by the Ministry of Environment. The CCO is a project implementation unit that does not even feature in the organizational chart of the Ministry. Nonetheless, CCO staff, who are not staff of the Ministry of Environment but are, rather, exclusively project funded, undertake key functions on policy development, although this is outside their mandate and, inevitably, above and beyond the capacity of the CCO.

This situation weakens the country's efforts to develop the required policies that will allow it to meet the challenges posed by climate change. Key climate change policy documents are developed by external consultants, reflecting the absence of relevant capacity at the Ministry level, where there are no regularly budgeted staff with climate change responsibilities within their portfolio.

Although limited efforts have been undertaken, the public in the Republic of Moldova remains largely uninformed about climate change matters. This is partly due to the fact that there is no coherent plan for raising public awareness, although individual, project-based efforts are taking place.

6.6 Participation in the Clean Development Mechanism

The biggest CDM project in the country focuses on reducing gas leakages within the Moldovagaz distribution network (table 6.3). The project aims to reduce gas leakages from "above ground" components in the natural gas distribution system in the Republic of Moldova. Gate and pressure regulation stations within the distribution network reduce and maintain the gas pressure for delivery to consumers. At these facilities, a small percentage of the natural gas throughput typically leaks from equipment and is released into the atmosphere, contributing to global warming. The project will lead to the reduction of GHG emissions, minimizing their contribution to climate change. The project will be implemented across a distribution network served by 12 gas distribution companies (subsidiaries) of JSC Moldovagaz..

Table 6.3: List of registered CDM projects

Registered	Title	Reductions (tons of CO_2 eq. per annum)
20-Jan-06	Moldova Biomass Heating in Rural Communities - I	17,888
20-Jan-06	Moldova Biomass Heating in Rural Communities - II	17,888
29-Jan-06	Moldova Energy Conservation and Greenhouse Gases Emissions Reduction	11,567
30-Jan-09	Moldova Soil Conservation Project	179,242
26-Oct-12	Biogas production from sugar beet press pulp Südzucker Moldova sugar plant	27,347
15-Nov-12	Moldova Community Forestry Development Project	39,056
17-Dec-12	Reducing gas leakages within the Moldovagaz distribution network	748,903

Source: UNFCCC (http://cdm.unfccc.int/Projects/projsearch.html), accessed 28 March 2013.

A smaller scale example is the project Moldova Biomass Heating in Rural Communities. The objective of the project is to reduce GHG emissions by implementing energy efficiency measures and fuel switching measures at one or more buildings. In terms of energy generation, it uses renewable biomass energy for heat production in rural areas, thus reducing GHG emissions. Most of the public buildings included in this project were supplied with heat from old boilers via a heat distribution network with a high level of losses. The new technologies employed by this project increase the overall efficiency of the district heating systems from 40 to 60 per cent and can reach up to 80 to 90 per cent.

6.7 Conclusions and recommendations

The Ministry of Environment has so far played a limited role in climate-change-related policy formulation and implementation. In practice, much of the policy formulation work, in addition to the preparation of national communications and the national GHG inventory, has been undertaken by the Climate Change Office, a project implementation unit under the umbrella of the Ministry of Environment. As such, the Climate Change Office is overburdened with duties that far exceed its mandate, and limited resources, by being heavily involved in policy development.

Recommendation 6.1:
The Government should strengthen its capacity to formulate climate change policy by creating a dedicated section on climate change within the regular structure of the Ministry of Environment.

Promoting climate change considerations in other areas of economic and social activity remains a much needed objective for guaranteeing not only economic resilience but also public health and social well-being. Effective intersectoral cooperation, in particular interministerial cooperation, is a prerequisite for achieving this goal. In reality, there is no high-level body that would be entrusted with strategic planning and high-level coordination of climate-change matters, although the National Commission for the implementation and realization of the commitments under the UNFCCC and of the mechanisms and provisions of the Kyoto Protocol could play this role, based on its founding act.

Recommendation 6.2:
The Government should strengthen the institutional role of the National Commission for the implementation and realization of the commitments under the United Nations Framework Convention on Climate Change (UNFCCC) and of the mechanisms and provisions of the Kyoto Protocol, by entrusting the National Commission with promoting the effective integration of climate change considerations in relevant economic sectors.

As of today, there is no climate change policy framework formally in place on either adaptation or mitigation, although the Republic of Moldova was making efforts to develop strategies on these issues. Due to weaknesses in the formulation of these strategies, however, there is a sense that funding for projects on the ground is generally lacking. The draft adaptation strategy contains actions for the future, without, however, identifying the sources of funding. Implemented projects on adaptation are almost exclusively funded by external sources.

Recommendation 6.3:
Once the national strategies on climate change mitigation and adaptation have been approved, the Government should ensure their implementation and make the necessary funding available from national sources, as well as through co-financing by donors.

There is evidence that the level of public awareness on climate-change-related issues in the Republic of Moldova is low. This is partly due to the fact that efforts at raising the level of awareness are project based. There is a lack of a coordinated and coherent national plan for raising public awareness.

Recommendation 6.4:
In the implementation of both the low emission development strategy and the climate change adaptation strategy, once these have been adopted, the Government should pay attention to raising the level of public awareness on climate change issues and therefore strengthen public participation in this area.

PART III: ENVIRONMENTAL MAINSTREAMING IN PRIORITY SECTORS AND PROMOTION OF SUSTAINABLE DEVELOPMENT

Chapter 7

SUSTAINABLE WATER MANAGEMENT

7.1 Introduction

The Republic of Moldova is a country with a natural disparity (inequality) of groundwater resources. Shallow ground and surface water is often highly polluted by anthropogenic activities. The poor quality of water still remains a problem, which is causing health problems for water users. Moreover, many water supply systems as well as sewerage systems and wastewater treatment plants (WWTPs) are in a poor condition and need to be maintained.

The poor quality of water resources is the result of the lack of sustainable water management to protect the resources from pollution from untreated or insufficiently treated wastewater, and industrial and agricultural activities. The lack of a comprehensive legal framework, a weak institutional framework and poor financing have led to the current fragile management of water resources. Future economic development relies, among other things, on the sustainable management and protection of water resources.

7.2 Water supply

A natural disparity of groundwater resources is one of the main issues concerning water supply management. The most important groundwater resources underlie the Dniester River and the amount which can be abstracted decreases the further away from the river one goes.

About 70 per cent of the population use groundwater as drinking water; however, the resource only represents about 15 per cent of all abstracted water. Shallow groundwater is found at a depth of 10 m to 30 m. Because of a relatively low precipitation, the yield of shallow wells is limited to the recharge. The deep layer of groundwater makes up approximately 70 per cent of groundwater resources in the Republic of Moldova. It is contained within the Baden-Sarmat formation at an average depth of 50 m in the northern part of the country, 100 to 200 m in the central part and 200 to 2,000 m in the southern part. Natural recharge of this aquifer is limited and exploitation needs to be controlled. In certain areas, aquifers have already been overexploited, resulting in deep cones of depression (table 7.1).

Water reservoirs are already highly exploited and the pressure on resources is steadily growing. Shallow underground reservoirs are polluted in most regions and are not available for drinking water without purification. Most new wells for drinking water purposes are drilled into the second layer of groundwater. New water reservoirs are not developed, so it is even more important to protect the existing reservoirs from pollution. Thirty per cent of the population is supplied from surface water sources. Among these, the most important is the Dniester River, which supplies about 83 per cent of the total amount of water abstracted. The second largest source is the Prut River, which provides about 1.8 per cent, while other sources account for 0.2 per cent of total water abstraction. The volume of water abstracted from surface water sources was about 721 million m³ in 2011. The Dniester and Prut Rivers mark the borders of the country with Ukraine and Romania. Surface water has to be transported to the centre of the country. Using surface water for drinking water supply requires long and expensive means of transmission to reach communities located in the centre of the country. Therefore, aquifers with good quality and quantity are already heavily exploited.

7.3 Water use

In 2011, 74 per cent of total water resources were used by industry, 15 per cent by households and 5 per cent in agriculture. Eight per cent of total water abstracted was lost during transportation. However, this small percentage seems unrealistic, given that most pipelines are old and poorly maintained.

Industry

Water use in industry has remained constantly on a level of about 580 million m³ per year since 2005. In 2011, 83 per cent of the total volume of industrial production was from manufacturing, in which the share of food and beverage industry was 45 per cent. The share of electricity, gas and water industry accounted for 15 per cent and the share of mining industry was 2 per cent. Since 2005, there have been no significant changes in the industrial sector. Water pollution from industrial production is probably significant, but data about water pollution from industries are not available.

Photo 7.1: Dniester River

Table 7.1: Water abstraction and use, million m^3

	2005	2006	2007	2008	2009	2010	2011	2012
Total abstraction, of which:	852	854	885	861	865	851	847	850
Groundwater abstraction	136	136	129	127	129	130	130	129
Water use in total, of which:	785	787	809	794	795	785	785	786
Industrial	583	583	581	581	580	581	580	580
Household	120	120	125	124	120	118	119	118
Agriculture	35	36	36	37	38	40	39	39
Other	47	48	67	52	57	46	47	49
Losses	67	67	76	67	70	66	62	64

Source: Statistical Yearbook of the Republic of Moldova, 2012.

Agriculture

The water volume used for irrigation decreased from 43.4 million m³ in 2005 to 39 million m³ in 2010. Due to ongoing irrigation sector reform, an increase in water demand for irrigation can be expected. Agriculture is one of the main surface and groundwater users and polluters because of agrochemicals and poor nutrient management practices, which contribute to the eutrophication of water bodies.

Agriculture is the main source of nitrous oxide discharges, caused by the application of nitric fertilizer and the associated soil fertility management. Furthermore, poor land and manure management practices contribute to the pollution of water.

Households

Currently, nearly 93 per cent of the population in urban areas and only 27 per cent of the population in rural areas has access to improved water supply systems. Of the total population, 59 per cent is connected to improved water supply systems. The main water source in rural areas is groundwater extracted manually from private or public wells. There are more than 7,000 artesian wells used for drinking water.

Water access in urban areas is generally good, according to the number of water supply systems, although pipelines are old and there is a need of rehabilitation.

In rural areas, access to a centralized water supply system is rare; most people have their own wells.

One of the main issues impacting on the management of water supply systems in rural areas is the increasing migration of the rural population to cities or abroad. Therefore, with fewer people in the villages, the demand for drinking water is decreasing, which makes a centralized system more costly on a per capita basis.

The average water use by households in the Republic of Moldova is rather low (about 125 l/cap/d). In rural areas it is much lower (50 l/cap/d). Before metering systems were introduced, water use by households was very high. For some years, most houses have had metering systems and water use has evidently decreased.

7.4 Public water supply

In 2012, there were about 1,032 localities with public water supply systems, including three municipalities and 52 cities. In total there are about 2,460 registered water supply systems in the country. Fifty per cent of these are considered to be in a satisfactory state, 44 per cent need complete rehabilitation and 1 per cent needs to be abandoned; no data are available for 5 per cent. About 977 rural localities (66 per cent of all rural localities) have some level of centralized water supply system.

Drinking water distribution networks have a total length of about 9,000 km, of which at least 3,700 km are in a very poor technical condition. As a result, there are up to five breaks per km/year which is a sign of serious deterioration of pipe integrity all over the country. Consequently, water losses are high and the quality of drinking water is poor because of infiltration. Water loss data are rarely obtained by measurements; water losses are usually estimated on the basis of design coefficients.

Apa Canal Chisinau is the biggest water supplier in the country, with a distribution of about 45 million m³ drinking water per year. (About one third of the population lives in Chisinau). Water abstracted from the Dniester River or artesian wells is purified (filtration and chlorination) before distribution into the pipelines. Drinking water in other urban areas is also purified. Purification of water abstracted from private shallow or artesian wells does not occur in rural areas.

7.5 Wastewater management

Access to sewerage systems is increasing very slowly, from about 42 per cent in 2005 to about 50 per cent in 2012. The country's Second Millennium Development Goals Report (2010) contained a target of 65 per cent of the population with access to improved sewerage by 2015. A high proportion (83 per cent) of the urban population is connected to a sewerage system, compared with only a small proportion (38 per cent) of the rural population. Pit latrines are the most common sanitation system in rural communities. Most private plots are very small, so the toilet is very close to a person's own well or their neighbour's well. Pit latrines are usually built by digging a hole in the ground. As a result, chemical and microbial contaminants from human excrement can be discharged into groundwater and may negatively affect human health. More and more people use improved pit latrines with the separate collection of faeces and urine, or composting toilets. Improved pit latrines usually have a waterproof container, which stops the contamination of groundwater from human excrement.

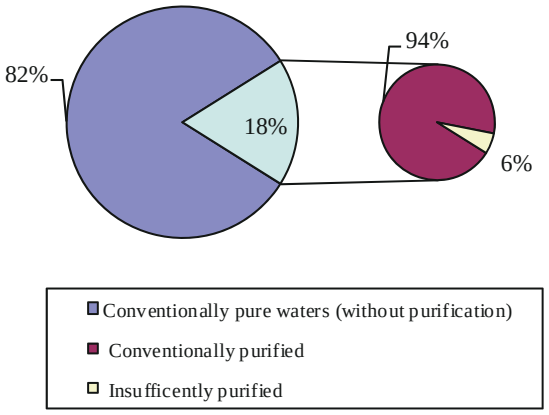
Currently, 632 localities have a centralized wastewater management system. Centralized wastewater infrastructure includes 464 wastewater treatment plants (WWTPs), 557 pumping stations and about 2,600 km of sewers, of which only about 360 km are in rural areas. The installed capacity of WWTPs equals 767,000 m³/d but the volume of wastewater collected is some 370,000 m³/d, so only 45 per cent of the capacity is used.

In 2010, 198 WWTPs were inspected by the State Ecological Inspectorate (SEI). Of these, 17 (9 per cent) were in a satisfactory state, 112 (56 per cent) require repair and 69 (35 per cent) require full refurbishment. The technical condition of the sewerage networks was: 25 per cent satisfactory, 13 per cent in need of repair, 55 per cent requiring full refurbishment and 7 per cent under construction.

Compared with water supply services, the development of sewerage systems and wastewater treatment is lagging. To realize future investment and strategies it is important to improve the sanitation infrastructure. In rural areas, decentralized wastewater treatment infrastructure is often the best solution, so there is no need to construct new canal systems and centralized WWTPs. In terms of decentralized solutions, alternative technologies to pit latrines such as EcoSan toilets for both private households and community facilities could be considered. In 2011, 689 million m³ of a mix of domestic and industrial wastewater was discharged into the receiving water bodies, of which 555 million m³ (82 per cent) were conventionally pure waters and so purification was not needed (figure 7.1). In 2011, total wastewater discharges from municipal WWTPs amounted to 126.5 million m³, of which 94 per cent were conventionally purified and 6 per cent were

insufficiently purified. However, data do not give full information about the status of WWTPs and their treatment efficiency.

Figure 7.1: Purification status of wastewater discharges, 2011



Source: State Ecological Inspectorate, 2011.

Most WWTPs, in fact, operate with mechanical treatment only. Many WWTPs are obsolete or do not work very well. As a result, discharges from WWTPs into water bodies are polluted by organic substances, ammonium and nitrates. Another reason for poor wastewater treatment is the large capacity of WWTPs relative to the incoming wastewater. For more efficient wastewater treatment, the capacity of WWTPs must be adjusted; thus, the receiving waters will be in better condition and operating costs can be reduced.

Industrial wastewater

Industrial wastewater is usually discharged into municipal WWTPs. Most industrial WWTPs which pretreat the polluted wastewater do not function properly, or at all, so the insufficiently pretreated industrial wastewater badly affects the performance of municipal WWTPs and, eventually, negatively affects the quality of the receiving water bodies. A lot of industrial WWTPs are old and obsolete. A huge amount of untreated industrial wastewater is currently discharged into rivers. The major problems are caused by the filtration beds of sugar factories, wineries and electronic enterprises.

7.6 River basin management

According to the 2011 Law No. 272 on Water, which enters into force on 26 October 2013, the Ministry of Environment is in charge of developing water quality management policies and legislation. The Agency "Apele Moldovei" is the water resources management agency responsible for river basin management. There are plans to create water basin management offices for two watersheds (the Dniester and Prut Rivers) (map 7.1). The slowing down of economic activity and a focus on transboundary rivers has resulted in the stabilization of the level of pollution of the big rivers (Dniester and Prut). No attention is paid to small rivers and streams.

7.7 Legal, policy and institutional frameworks

Legal framework

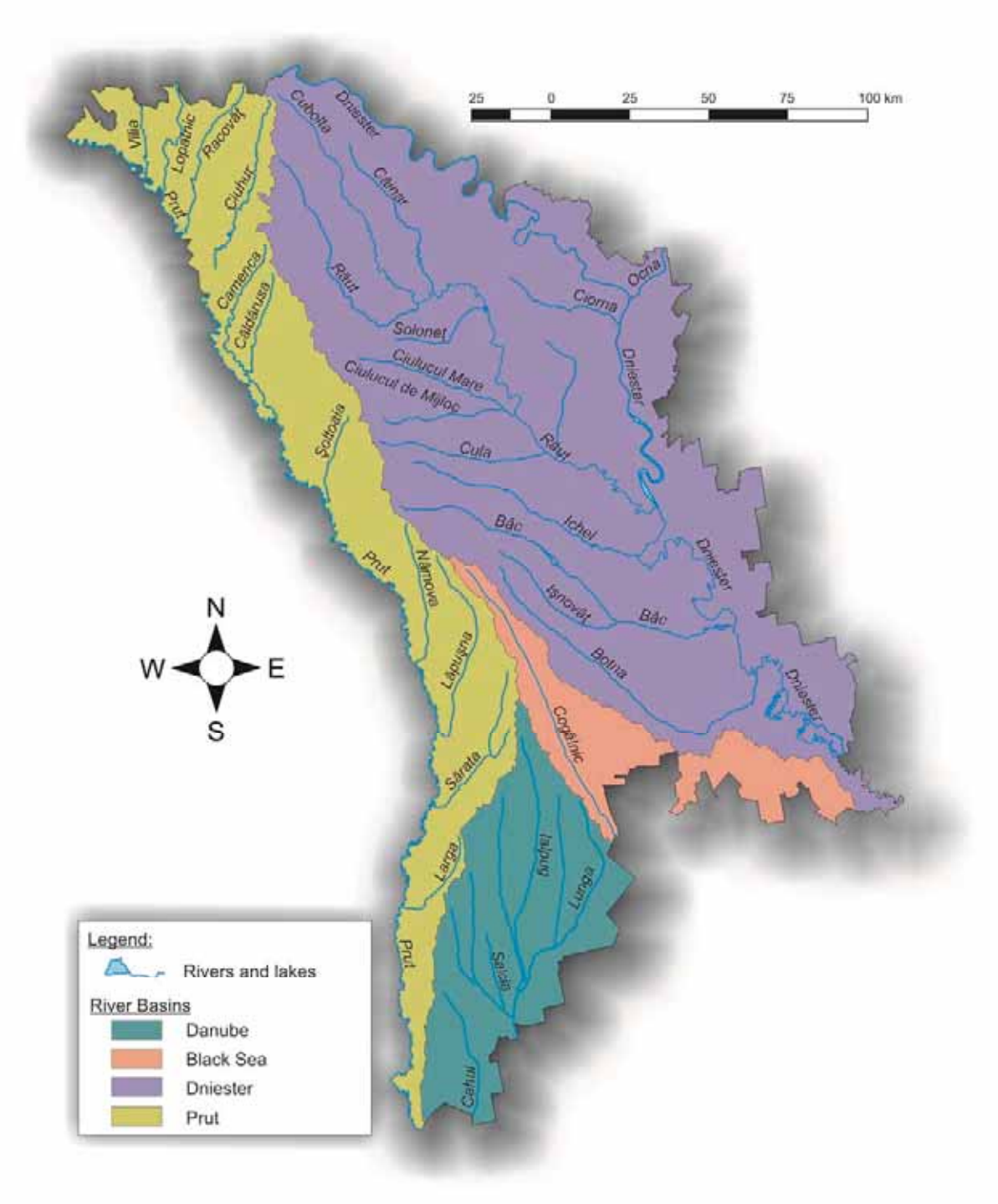
Most of the water legislation was enacted before 2005. Since then, mostly due to capacity gaps, especially the absence of lawyers to deal with law drafting within the Ministry of Environment, water-related law-making has been very slow. As a result, most laws are not convergent with the EU *acquis* and many fields are not regulated by law at all. Water legislation is currently undergoing fundamental changes. A new Law on Water was adopted in 2011 and will enter into force on 26 October 2013. It repeals the 1993 Water Code and creates a comprehensive legal framework for management, protection and efficient use of surface water and groundwater. The 2011 Law No. 272 on Water sets environmental quality standards to protect water from pollution. Wastewater discharges from urban and rural areas will be regulated in distinct ways. Zones vulnerable to agricultural pollution will have to be designated. Twenty-three secondary regulations are being developed in cooperation with relevant stakeholders to supplement the 2011 Law on Water and to partly transpose key water-related EU directives into the national legislation.

Strategic documents, policies and programmes

Strategy of Water Supply and Sanitation of Communities

The 2007 Strategy of Water Supply and Sanitation of Communities (Water Strategy) sets out specific medium-term (2008–2012) and long-term (2012–2025) objectives which include, inter alia, decentralization of services, promotion of market economy principles, extension of networks, tax incentives for private investors in infrastructure, environmental protection and social partnership. Investment budgets for each timeframe are also stated and potential sources of financing are described.

Map 7.1: River basins



Source: Ministry of Environment, 2013.
Note: The boundaries and names shown on this map do not imply official endorsement or acceptance by the United Nations.

However, the Water Strategy lacks a national water action plan that would provide an overview of all reforms needed in the water sector. Such a plan would allow prioritization and proper costing of water and sanitation needs as well as elaboration of technical designs for all new projects. The Water Strategy appeared to be not realistic financially. Due to the lack of funds and limited management capacities of governmental institutions, implementation of the specific medium-term objectives proved to be difficult.

In 2012, the Water Strategy underwent revision. This was driven by economic and political changes in the

country, which required the updating of plans for the water supply and sanitation sector. The revised Strategy is based on key strategic documents adopted by the country, such as the 2005 Millennium Development Goals, revised in 2007, the NDS for the period 2008–2011, the National Regional Development Strategy for the period 2010–2012, and the targets and target dates under the Protocol on Water and Health approved by the 2010 Joint Order of the Minister of Health and the Minister of Environment.

The intention of the revised Water Strategy is to support future development in the water supply and sanitation sector in the short term (target year 2017) and the long term (target year 2027). The revised Strategy includes an action plan for implementation within the first three years (2012–2014), which describes targets and capacity that will be necessary for the management and monitoring of those actions. Moreover, the Strategy includes an investment plan for policy guidance for the period 2012–2017, which lists basic fields for future development of drinking water and wastewater in urban and rural areas and estimates the financial resources needed. A list of localities proposed for investment during 2013–2017 has also been developed.

The estimated capital investment for implementing the revised Water Strategy is around €705 million over the period 2013–2027. This means that domestic investments must rise continuously from around €40 million per year from 2013 to 2017 up to around €60 million per year from 2018 to 2027. The Strategy does not include actions to protect water sources from anthropogenic pollution, however.

Water and health

In 2005, the Republic of Moldova became party to the Protocol on Water and Health to the 1992 Convention on the Protection and Use of Transboundary Watercourses and International Lakes. To achieve the goals set in the Protocol, the Republic of Moldova had to establish national and local targets and target dates until 2020, taking into account the entire water cycle. The targets and target dates were established in 2011 by the Ministry of Environment and Ministry of Health, with the assistance of ECE and the Swiss Agency for Development and Cooperation (SDC).

The document on setting targets and target dates under the Protocol on Water and Health in the Republic of Moldova sets 34 targets with specific target dates. Among other targets, it covers those for drinking water quality, access to drinking water and sanitation, and the reduction of untreated or insufficiently treated wastewater discharges, and river basin management plans. Moreover, it describes institutions that should be responsible for implementation. However, it lacks cost estimates for individual targets, as well as an estimation of the human resources needed by the ministries and agencies for planning, development, management and monitoring.

National Development Strategy 2008–2011

In regard to water and sanitation, the 2007 NDS for the period 2008–2011 promoted the achievement of MDG7 “Ensure environmental sustainability”. It had the same objectives as the MDGs:

- Improve access to safe water sources (for the country, to 65 per cent of the population);
- Improve sewerage and sanitation systems;
- Increase the proportion of the population with access to sanitation systems (for the country, up to 71.8 per cent).

National Regional Development Strategy 2010–2012

The main purpose of the National Regional Development Strategy for the period 2010–2012 is to harmonize regional development across the whole country. The wastewater and sanitation sector is not a basic part of the Strategy, but the Strategy includes objectives which are relevant for infrastructural investment in the sector. Regional development agencies, in cooperation with local public authorities, are responsible for the implementation of the Strategy. They develop and implement regional development strategies based on the National Regional Development Strategy.

Transition to High Value Agriculture 2011–2015

The Millennium Challenge Corporation project Transition to High Value Agriculture for the period 2011–2015 is funded by the Millennium Challenge Corporation (MCC) (chapter 10). It has two components. The first concerns changes to irrigation management. There is a plan to create a water users association to rehabilitate 11 central irrigation systems. The goal is to group the water users of these 11 small central irrigation systems in a bigger water users association in order to have better understanding of the situation and then to streamline the rehabilitation of these systems. It is also planned

to train specialists involved in irrigation system management and establish a national network (10 mobile stations) that will monitor water quantity and quality in real time. The second component is related to river basin management. The project will contribute to improving the monitoring network through the purchasing of equipment for real-time water quality monitoring, developing a GIS database and training Agency "Apele Moldovei" specialists.

Since 2010, the irrigation sector has been undergoing reform. This began with the Compact project Transition to High Value Agriculture which will last until 2015 (chapter 10). The Agency "Apele Moldovei" is responsible for management of this programme. It aims to catalyze investment in agricultural performance by establishing a sustainable model of irrigation and water management as well as an institutional and policy environment favourable to irrigated agriculture. A pilot project of rehabilitation of 11 irrigation networks (see above) has already started. The reform transfers the responsibility for management of irrigation networks from the government to 11 associations of irrigation water users, which were created with the assistance of the programme.

Regulatory instruments

Every water user and wastewater discharger must have a permit which defines the extent of water use and sets limits for environmental pollution. Permitting and compliance reviews are conducted by the SEI. The SEI summarizes the results of its inspections in an annual report. All registered water users report to the SEI on a weekly, monthly and yearly basis (chapter 2).

The SEI is in charge of inspecting industries, but no monitoring of industrial pollution sources is carried out. Reliable data on industrial wastewater are not available. The lack of data makes it impossible to assess the degradation of surface and groundwater caused by the industrial sector.

Investments

The total amount invested in the wastewater and sanitation sector from 2008 to 2012 was about €120 million. The greatest amount was provided by international donors (68 per cent); 32 per cent of investments were from domestic sources. It is a small sum compared with investment of €1.3 billion to €3.2 billion estimated as necessary in a 2011 OECD study to implement the 2007 Water Strategy.

As a share of GDP, the total amount allocated to the water sector (foreign and domestic donors) was 0.4 per cent in 2008, 0.7 per cent in 2010 and 0.5 per cent in 2011.

Domestic investments in the water sector are funded from the National Environmental Fund (NEF), National Fund for Regional Development (NFRD) and Social Investment Fund (SIF) (chapter 3).

For the period 2010–2012, 335.15 million lei (54.7 per cent of investments funded by the NEF) were invested in wastewater and sanitation sector projects, which mainly involve improving water infrastructure. It is not clear how such projects are selected and implemented. There is a lack of an investment strategy for projects on sustainable water management, which start from water resource protection and end in providing users with safe drinking water.

More wastewater and sanitation projects are funded by the NFRD. Regional development agencies develop regional development plans and apply to the Fund for finance on a project basis.

There is a lack of information flow among funding sources and also among the public authorities responsible for the wastewater and sanitation sector. Close cooperation would yield great benefits for the sector for developing, evaluating, financing and monitoring projects.

Besides investment in new infrastructure, the recurring costs of operation also have to be met. These expenses for operation and maintenance must be ensured by the water operating companies (WOCs) on the basis of a sustainable tariff policy.

However, water tariffs set by the National Energy Regulatory Agency (ANRE) are approved by the municipal councils and are persistently kept below the maximum affordability baseline of 5 per cent of household income. Thus, the lack of money leads to loss of revenue and diminishing possibilities of covering operational and maintenance costs, along with minimizing the sources of potential investment in infrastructure reconstruction.

Institutional framework

Ministry of Environment

Within the Ministry of Environment, the Department of Water Management covers the water supply and sanitation sector, and the Department of Analysis, Monitoring and Policy Evaluation is responsible for monitoring the implementation of water projects.

The Agency "Apele Moldovei" is the administrative authority responsible for implementing State policy on water resources management, water supply and sanitation. It is subordinated to the Ministry of Environment. It has two divisions: the Division for Water Management and the Division for Water Supply and Sanitation. The Division for Water Management deals with the use of natural water resources in the interests of the national economy (industries, energy, irrigation, water supply) and water quality protection. This field also includes protection from floods, erosion and soil silting, and landslides. The Division for Water Supply and Sanitation is responsible for collecting data on supply, consumption, losses during use and supply, and sewerage.

The SEI issues permits for water abstraction and wastewater discharges ("special water use") in consultation with other statutory stakeholders, including the water management authority (Agency "Apele Moldovei") and health authorities. It also monitors compliance with effluent requirements and imposes administrative sanctions for violation of environmental legislation. At the local level, these functions are performed by district offices. The central office of the SEI issues permits for special water use and permits for water pollution for economic actors. It also monitors economic actors for permit compliance.

The State Hydrometeorological Service (SHS) is in charge of monitoring the quality of surface waters (chapter 4).

The Agency for Geology and Mineral Resources (AGMR) is responsible for management and monitoring of the quantity and quality of groundwater reserves. Parameter monitoring of the water regime is implemented through a State network of 180 underground wells in 33 localities. Each well has a "passport" in which all the information about quantity and quality of groundwater is archived. In 2004, the creation of a database on groundwater resources began as part of the Water Data Centre, beginning with the introduction of data on 1,600 wells.

Other institutions

The Ministry of Health is responsible for national legislation and policymaking on drinking and bathing water quality. Its State Sanitary and Epidemiological Service of Public Health is responsible for the assessment of water quality for the purposes of compliance with health standards. The data are collected by the National Centre for Science and Preventive Medicine and the territorial centres of preventive medicine, and analysed by their laboratories.

The Ministry of Regional Development and Constructions is responsible for the National Regional Development Strategy, which also covers the physical infrastructure for water supply and sanitation. Its regional development agencies develop and implement the National Strategy as well as the operational plans and their annual implementation at the regional level. Within the water sector, the regional agencies operate projects to improve the physical infrastructure for water supply and sanitation.

The National Energy Regulatory Agency (ANRE) is responsible for water tariffs and develops the methodology for determining, approving and applying the tariffs for public water supply and sanitation and wastewater treatment services. Water tariffs are ultimately to be approved by municipal councils.

Water operating companies

In 2000, the water sector was decentralized and the provision of water and sanitation services was transferred to local governments and their subsidiary water operating companies (WOCs), called "Apa canals". WOCs are represented at the national level by the Apa Canal Association (AMAC). AMAC drives benchmarking on a voluntary basis and provides training and technical support to its members. Local governments (1,535 in all – two large municipalities, 53 towns and 1,480 rural communities) are responsible for their local wastewater and sanitation services. Municipalities are the effective owners of water networks, whereas WOCs are the operators. The WOCs suffer from a lack of financial resources, which leads to a lack of maintenance capacity and system development. In addition, mid-term and long-term planning lags far behind the level required. The resulting service-level implications are severe.

Across the country, 38 WOCs provide water supply and sanitation services. Thirty-one operate as municipal enterprises and seven as joint stock companies. WOCs are responsible for wastewater and sanitation services in urban areas, small cities and towns. Water supply systems in rural areas are managed by water user associations with the status of NGOs.

Water utilities are, in general, small organizations with limited numbers of qualified professional

managers and staff. The main problem of the water supply and sanitation system is the uneconomically small areas of exploitation of some municipalities.

Currently, a pilot project on the regionalization of WOCs is being carried out in six districts, financed by the EBRD. The goal of the project is to group 38 small and often inefficient WOCs into larger WOCs with greater responsibilities in order to ensure provision of an adequate supply of drinking water and improve wastewater treatment systems. The grouping would increase efficiency and lower costs. Under this project, municipalities are committed to adjusting tariffs and introducing cost recovery by their respective water companies to ensure financial viability.

Exchange of water-related data

The State Water Cadastre is maintained by the Ministry of Environment and three subordinated institutions: the Agency "Apele Moldovei", SHS and AGMR. Other governmental institutions also collect data related to water. Cooperation and exchange of environmental data among governmental institutions is still poor. Until now, data have been collected and stored in the Water Cadastre on paper; assessment of data and evaluation of collected data is not happening. The Ministry of Environment is currently working on digitizing existing data.

7.8 Conclusions and recommendations

In some regions of the Republic of Moldova, water resources are limited and often polluted by anthropogenic activities. Currently, water resources management does not meet requirements due to the lack of a comprehensive legal framework, financial resources and institutional coordination and cooperation.

From 2013, the 2011 Law No. 272 on Water and its secondary legislation could be the key element for essential transformation of the water sector. Following the first step of developing a comprehensive legal framework, the next step could be the coordinated implementation of the water legislation, in the near future.

Recommendation 7.1:
To implement the 2011 Law No. 272 on Water, the Ministry of Environment should:

(a) Increase the capacity of the water departments within the Ministry of Environment and subordinate institutions;

(b) Improve cooperation between the relevant institutions;

(c) Ensure enforcement by a competent authority.

There are various governmental institutions involved in the collection, management, assessment and dissemination of data related to water, but there is still poor cooperation among them. The exchange of data is sporadic and limited. A first step in centralizing data storage in the water sector was taken with the introduction of the water cadastre. However, the State Water Cadastre does not contain all relevant data and is available to neither all stakeholders involved in the water sector nor to the public.

Recommendation 7.2:
The Ministry of Environment, in cooperation with the relevant authorities, should ensure that the State Water Cadastre is fully operational and publicly accessible.

In the Republic of Moldova's water sector, different strategies have been developed to achieve aims established by national or international policies. Most strategies are not implemented. However, one of the main reasons for this is the lack of a national action and investment plan for the water sector, in which projects would be listed and prioritized. Due to the limited financial resources available from domestic sources, the Republic of Moldova's water sector relies on international support.

An action plan with an integrated investment plan would improve the effective investment of limited national funds; moreover, it could be a sound basis for international donors to invest in the Republic of Moldova's water sector and diminish the ongoing financing gap.

Recommendation 7.3:
The Government should develop an action plan for the water sector, accompanied by an investment plan, to implement the revised Strategy on Water Supply and Sanitation for Communities (Water Strategy) and to reach national targets set in accordance with the requirements of the Protocol on Water and Health, and ensure adequate funding for monitoring and evaluation of the implementation of the action plan.

Water resources are increasingly under pressure from the growing population in cities, economic activity and intensifying competition among water users. Responsibilities for the prevention of pollution of ground and surface water rest on different stakeholders. The lack of an integrated water

resource management plan at the national level leads to uncoordinated water resource development and management and, consequently, to the ongoing pollution of water resources.

Recommendation 7.4:
The Ministry of Environment should promote a wider integrated water resource management process coordinated with the implementation of the revised Water Strategy. To this end, among other matters, it should strengthen river basin management offices, which are responsible for the development of river basin management plans, taking into consideration watershed protection and the development of small intake waters.

Many existing sewerage systems are old and their material degradation tends to allow the exfiltration of wastewater, which causes the pollution of groundwater. Existing WWTPs do not function properly due to technical problems, on the one hand, and their inappropriate size, on the other. As a result, treated wastewater does not often comply with quality standards and is one of the main polluters of surface water.

Recommendation 7.5:
The Government, in cooperation with local authorities, should assess the current situation of sewerage systems in urban areas and wastewater treatment plants (WWTPs) and, based on the results, ensure adequate funding for the rehabilitation and modernization of sewerage systems and WWTPs.

Chapter 8

WASTE MANAGEMENT

8.1 Trends in waste management

Waste management in the Republic of Moldova has developed only moderately since 2005. International donors increased their involvement in waste management during the last few years and this resulted in improvements in management of obsolete pesticides and expired chemicals, but management of municipal and manufacturing waste is developing slowly and old practices remain.

Restructuring of the manufacturing, industrial, quarrying and agricultural sectors resulted in reduced pressures from waste management on the environment. This development reduced generated amounts of waste and in some sectors also decreased the amount of waste previously accumulated.

The existing waste management infrastructure does not comply with international standards and has to be significantly improved to ensure safe and reliable recovery and disposal of waste. The development of modern waste management infrastructure is still in the initial phase. The Government has prepared a draft law on waste management and a National Waste Management Strategy which was approved by the parliament in 2013.

Municipal solid waste

Data on management of municipal solid waste (MSW) are collected by the National Bureau of Statistics (NBS). Data are requested from waste collection companies, which report annual waste volumes collected. Data on generated MSW are not available but, considering that only the urban population is served by regular collection, only about 50 per cent of waste generated in the Republic of Moldova was collected in 2011.

The amount of collected MSW doubled during the last decade (table 8.1). The view on collection of MSW from a territorial perspective (table 8.2) shows that the majority of MSW is generated and collected in Chisinau – more than two thirds of all MSW collected in the Republic of Moldova. Thus, the increase in collected MSW can be related to the increase in GDP per capita (PPP based) in the capital, but in other parts of the Republic of Moldova the increase in collected MSW was higher than the national average and, therefore, improvement of collection services may be the reason for the reported increase in MSW.

The composition of municipal waste in Chisinau was analysed at least two times (table 8.3). The results indicate a high proportion of biodegradable waste. This is typical for developing countries.

The company "I.M. Regia Autosalubritate" provides waste collection and disposal services to Chisinau. The municipally owned company employs 350 people and operates a fleet of collection vehicles, and a transfer station and landfill at Tintareni. The company is modernizing the collection fleet. In addition, containers of a Russian type (0.75 m^3) are being replaced by standard Eurocontainers (1.1 m^3).

Currently, there are 7,800 containers of 0.75 m^3 capacity and 1,500 containers of 1.1 m^3 capacity distributed throughout Chisinau. These containers are collected daily, including weekends and holidays, and the town centre is served twice a day. The waste collection scheme for municipal waste from Chisinau is designed so that waste is taken to a transfer station in Chekani, which lies on the outskirts of Chisinau, and from there it is transported 20 km to the landfill at Tintareni.

Table 8.1: Development of municipal solid waste collection

	2000	2005	2006	2007	2008	2009	2010	2011	2012
Collected MSW (thousand m^3)	1,144.6	1,268.5	1,353.6	1,790.6	2,130.8	2,211.3	2,302.6	2,350.0	2,421.1
Urban population (thousands)	1,514.2	1,476.0	1,469.8	1,478.0	1,476.1	1,476.1	1,476.7	1,481.7	1,485.8
Collection (m^3/person)	0.76	0.86	0.92	1.21	1.44	1.50	1.56	1.59	1.59
GDP in constant 2005 prices (US$ million)	6,030	8,492	8,898	9,165	9,883	9,291	9,950	10,628	10,542
Collection (m^3/US$ thousand)	0.190	0.149	0.152	0.195	0.216	0.238	0.231	0.221	0.230

Source: Statistical Yearbook of the Republic of Moldova, 2012; World Economic Outlook, 2012.

Table 8.2: Collection of municipal solid waste by region

Region/Municipality	Population 2011		Collected MSW (thousand m^3/yr)				
	Total	Urban	2007	2008	2009	2010	2011
Total	3,560,430	1,481,696	1,790.6	2,130.8	2,211.3	2,302.6	2,350.0
Chisinau	789,534	719,593	1,230.0	1,542.6	1,519.5	1,550.1	1,556.9
Balti	148,922	143,992	202.4	212.8	222.6	218.3	229.2
Central	1,062,848	205,251	168.9	159.8	189.6	178.3	185.0
South	540,756	136,163	69.8	78.0	100.2	104.2	110.1
North	857,700	211,989	101.7	119.6	159.6	163.2	173.1
ATU Gagauzia	160,670	64,708	17.8	18.0	19.8	88.5	95.7

Source: Natural Resources and Environment in Moldova, 2011.
Note: ATU = Autonomous Territorial Unit

Table 8.3: Composition of municipal solid waste in Chisinau, per cent

Type of waste	2003/4	2011
Paper and cartons	5.1	2.0
Organic substances (food waste)	64.6	74.0
Organic substances (leaves, branches)	3.9	1.0
Glass	4.1	5.0
Metals	3.1	2.0
Plastics	9.7	5.0
Textiles	4.9	2.0
Construction waste (wood)	1.7	1.0
Construction waste (stones, mortar)	2.9	4.0
Other		4.0

Source: I. M. Regia "Autosolubritate", 2013.

Outside Chisinau, collection is organized by municipal authorities. Research done in the Development Region South has found that the collection equipment is sufficient to provide collection services and municipalities are actively searching for investments in the modernization of waste management infrastructure. Waste management services are organized only in urban areas. Due to the fact that approximately 25 per cent of the population live in urban areas (excluding the municipalities of Chisinau and Balti), the number of beneficiaries of the service is quite low. The frequency of household waste collection is daily, and waste collection routes are usually well defined.

The current waste management practice relies on disposal in dumpsites. These are, in the majority of cases, small, uncontrolled and operating without an environmental permit. Only 12 national level permits have been issued for disposal sites in the Republic of Moldova. The remaining 1,864 disposal sites are operating on a land allocation decision issued by the local council. The landfill at Tintareni was developed according to the 2001 Master Plan for Construction of Solid Waste Landfills prepared by the State Institute of Design (IPROCOM). The landfill was put into operation in 1991 and ceased operation in 2010 by the decision of Chisinau Municipal Council. The reason for cancelling the operation was the end of its lifespan, defined by IPROCOM as being 20 years. However, the full capacity of the site was not reached; of the designed 44.2 million m^3 only 19 million m^3 was used. The designed waste generation rate was overestimated and the Tintareni landfill has potential to receive waste from Chisinau for another 20 years. Due to the closure of Tintareni landfill, "I.M. Regia Autosalubritate" does not have any other option than dumping waste in a temporary location in the vicinity of the waste transfer station, without any measures to control potential pollution.Typically, each district has one larger disposal site, which serves the district administrative centre, and a number of smaller/rural dumpsites serving one or more villages. Based on the dumpsite inventory done in the Development Region South and local research, there are approximately 20 to 25 rural dumpsites operating by the decision of local authorities and, in addition, more than 100 illegal dumpsites per district. In most cases, the licensing procedure is formal and the majority of approved dumpsites do not, to a large extent, follow the requirements for construction, environmental protection and human health.

Close to the waste transfer station at Chekani, a private company, ABS, is developing a modern waste sorting plant with a final capacity of 60 t/h of mixed MSW. For comparison, if the plant is operated at full capacity (three shifts) this corresponds to the annual MSW generation of Chisinau. Currently, the first of six lines is being assembled. Once the cooperation of Chisinau waste collecting companies is secured, it is expected that the amount of waste for disposal will decrease by 50 to 60 per cent. However, there does not seem to be a contract or clear cooperation between the city authorities and this private company; thus, the success of the project is at risk. This private company also provides separate collection of waste plastics throughout the whole territory of the Republic of Moldova, having only 1,500 containers in Chisinau.

Photo 8.1: Dumpsite near Cioburciu village

National authorities are focusing on reducing illegal dumpsites. The total area of the 1,864 identified dumpsites is approximately 1,400 ha. A number of municipal dumpsites, which in total cover about 40 per cent of this area, are operating without a permit. As a result of efforts by the environmental authorities, the area occupied by unauthorized dumpsites has decreased from 686 ha in 2004 to 434 ha in 2009. In the percentage ratio, this decrease is even more evident – from 61 per cent in 2001 to only 31 per cent in 2009. The total number of unauthorized dumpsites also trended downward, from 1,356 in 2001 to 854 in 2009, and their share of all dumpsites from 73 to 46 per cent.

Recently, several districts have improved their waste disposal systems and at-source waste separation in cooperation with international donors. Leova District benefited from cooperation with the Czech Development Agency in 2009 by developing a waste management plan, introducing separate collection, closing existing dumpsites and upgrading another disposal site which has less environmental impact.

Soldanesti City developed a regulation on local waste management and environment protection in cooperation with Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) in 2010. This cooperation includes the introduction of the 3R approach (reduce, reuse, recycle) to improve waste management and should result in remediation of existing dumpsites, development of a new disposal site and expansion of the waste collection system implemented in Soldanesti to seven neighbouring villages, thus introducing a regional approach to waste management.

Waste from production and consumption

The legislation does not clearly differentiate between industrial and municipal waste. The existing law defines waste from production and consumption. As a result, waste statistics provide information which covers both types of waste. Waste from production and consumption in the Republic of Moldova is monitored by the NBS. Data are requested from economic agents (legal entities and individuals performing economic activities), which report waste amounts (t/year) to local environmental inspectors. This approach is acceptable for recording waste data; however, there can be a group of non-registered waste generators.

Manufacturing of food products and beverages is the largest industrial sector in the country (41.7 per cent), followed by production and distribution of electricity (9.1 per cent), manufacturing of construction materials and glass (8.7 per cent) and production of wine (7.2 per cent). The quarrying sector represents less than 2 per cent of industry. None of the other industrial sectors exceeds 5 per cent of total industrial output. This structure of industry does not generate

the larger amounts of waste that would require complex waste management infrastructure.

Due to the underdeveloped waste management sector, enterprises rely on their own means of transportation for waste disposal. Smaller enterprises use MSW disposal sites and larger ones dispose of waste on their own site.

Generation of waste from production and consumption is distributed more equally on the territory of the Republic of Moldova than generation of MSW. This reflects the fact that light industries, producing less waste, are concentrated in Chisinau and industries which generate more waste are in the countryside. About 20 per cent of total generated industrial waste is reused or recycled.

The amount of industrial waste undergoing disposal or final treatment on the territory of Chisinau Municipality is more than double the amount of waste generated there. This indicates that significant amounts of waste are transported to Chisinau for processing. For further analysis of industrial waste it is necessary to focus separately on manufacturing, agricultural and quarrying waste (below), because different factors influence waste generation, treatment and disposal in each sector.

Manufacturing waste

The majority of manufacturing waste is generated by food products and beverages manufacturing, which is the largest sector of the economy in the Republic of Moldova. This sector is reported to contribute about 85 per cent of generated manufacturing waste (table 8.4). The output of this sector has decreased by about 25 per cent since 2005, which is reflected in waste generation from the sector.

Other large waste generators include companies producing non-ferrous mineral products, which include those manufacturing glass, glass products, tiles, bricks, concrete, gypsum and cement, and also cutting, shaping and finishing stone. These industries account for about 10 per cent of generated manufacturing waste.

The average rate of on-site recycling in the manufacturing sector is about 25 per cent of generated waste, and about 35 per cent is sent for disposal. The remaining 40 per cent is sent to other companies for recycling or reuse, given that the amount of waste stored at source is decreasing. Similarly, as has been stated for the total industrial sector, in the period 2005–2011, the manufacturing sector showed slight improvement in waste management, but this was driven more by the economic situation than by improvements in the management of waste per se.

Agricultural waste

This category includes waste from agricultural plant production and animal breeding, as well as waste from forestry and hunting (table 8.4). The majority of waste is generated by agricultural activities.

Agricultural output is generated by agricultural companies (30 per cent), farmers' cooperatives (20 per cent) and family farms (50 per cent). This structure has not changed significantly since 2005; thus, neither was the waste generated by these producers affected by structural changes in the sector. The situation in agriculture started to improve after reform of the agricultural sector. In addition, the introduction of market principles in agriculture is putting pressure on farmers and cooperatives towards more effective farming, resulting in better utilization of waste and higher recovery rates. According to the production volume indices, the output from agriculture decreased about 10 per cent compared with the situation in 2005. The significant decrease in waste generation after 2008 may be related to changes in reporting requirements.

The generation and reuse of agricultural waste increased in the period 2009–2011, while disposal rates are relatively stable. This also indicates slight improvement, but without changes to the approach to waste management practice. The drop in amounts reported in 2008–2009 was caused by a change in methodology.

The increase in reuse and recycling of agricultural waste was caused by improved management and also by using waste from wine and crop production for production of wood briquettes. Agricultural companies are using their own sites for disposal of waste, and part of the waste generated mainly by small farmers ends up in municipal waste disposal sites.

Waste from the public administration, services and utilities sector

Waste reported from the services sector includes commercial services and public administration (table 8.4). Waste from utilities includes waste from wastewater treatment (sludge), and from production and distribution of electricity, water and gas (table 8.4). Waste from services provided by public administration consists mainly of household waste, septic waste, park maintenance and street sweeping.

Table 8.4: Generation and use of waste in enterprises and organizations, thousand tons

	Existing at the beginning of the year	Generated	Inputs	Used	Supplied	Destroyed or transported to dumps	Existing at the end of the year
Total							
2008	3,518.1	3,405.9	1,372.6	1,867.7	644.8	1,774.7	4,009.4
2009	4,009.4	2,487.9	1,680.8	668.9	677.9	978.8	5,852.5
2010	5,847.9	1,860.3	3,253.0	1,435.2	961.6	1,511.5	7,052.9
2011	7,049.9	1,845.3	1,264.4	418.4	2,045.0	1,580.0	6,115.4
of which:							
Waste of quarrying enterprises							
2008	3,134.3	539.4	479.2	267.4	232.5	0.3	3,652.7
2009	3,652.7	1,256.2	1,255.4	295.3	271.3	0.1	5,597.6
2010	5,597.3	439.3	2,073.9	1,064.4	204.4	0.0	6,841.7
2011	6,841.7	423.4	..	17.2	1,228.0	140.0	5,879.9
Waste of livestock production							
2008	194.0	249.1	31.8	188.5	3.0	197.0	86.4
2009	86.4	333.3	49.2	190.2	1.7	184.2	92.8
2010	81.2	279.2	27.6	204.3	7.6	115.6	60.5
2011	60.5	328.3	38.0	198.2	6.5	155.6	66.4
Waste of foodstuff and drinks production industry							
2008	70.6	1,572.3	33.4	1,289.7	210.3	97.5	78.8
2009	78.8	258.7	6.9	56.8	160.9	88.7	38.0
2010	38.0	368.8	4.8	23.6	198.4	152.3	37.3
2011	37.3	394.6	2.9	20.4	251.8	125.9	36.7
Waste of housing and communal services and domestic waste							
2008	68.4	712.4	16.5	8.1	0.0	644.7	144.5
2009	144.5	341.5	32.5	5.7	0.0	456.3	56.5
2010	56.5	416.6	699.6	6.0	..	1,102.8	63.9
2011	64.0	461.9	914.1	35.1	182.7	1,139.1	83.2
Waste of inorganic chemistry							
2008	13.1	1.0	..	0.0	0.2	0.0	13.9
2009	13.9	0.9	0.0	0.0	0.0	0.0	14.8
2010	14.8	0.0	..	14.5	0.0	0.0	0.3
2011	0.3	0.0	..	..	0.0	0.3	0.0
Waste of plant growing							
2008	1.6	41.0	0.4	16.3	7.8	15.2	3.7
2009	3.7	32.7	0.2	14.5	5.6	13.7	2.8
2010	2.8	37.5	0.7	17.9	5.1	15.3	2.7
2011	2.6	33.6	1.9	17.0	5.4	11.5	4.3
Secondary raw material for ferrous metallurgy							
2008	13.0	10.0	125.0	2.8	135.6	0.4	9.2
2009	9.2	9.4	65.2	3.5	69.6	1.0	9.7
2010	9.7	8.6	148.1	0.7	148.3	0.2	17.2
2011	16.4	10.6	259.3	4.2	262.9	0.3	18.9
Waste of forestry industry							
2008	4.4	17.7	..	2.6	13.6	0.8	5.1
2009	5.1	12.8	..	2.7	9.6	1.0	4.6
2010	4.6	11.2	..	2.9	8.6	0.5	3.8
2011	3.8	49.2	..	0.2	42.8	3.0	6.8
Secondary raw material for nonferrous metallurgy							
2008	1.4	0.2	5.6	1.6	4.0	0.0	1.6
2009	1.6	0.3	2.8	0.0	4.1	0.0	0.6
2010	0.6	0.2	6.7	0.0	6.4	0.0	1.1
2011	1.1	0.2	11.3	0.2	11.2	0.0	1.1

Source: Natural Resources and Environment in Moldova, National Bureau of Statistics of the Republic of Moldova, 2010, 2012.

As this sector includes a wide range of waste, characterization of trends in generation, reuse and disposal is very complex. In the utilities sector, the amount of waste disposed of is much larger than

waste generated as the sector receives waste from non-reporting entities and persons.

Quarrying waste

The quarrying sector in the Republic of Moldova supplies materials for production of construction materials. Although it has only a small share of the industrial output of the country (about 2 per cent), it generates, on average, about 22 per cent of all reported waste (table 8.4). A large part of the quarrying waste is stored at the premises of companies, which is normal practice.

Construction waste

Monitoring of the management of construction waste (table 8.4) covers only part of that waste – that generated by larger companies. Construction waste from individuals modernizing their apartments should be transported to designated sites, but this system is not working satisfactorily. Larger amounts of this small construction waste remains within towns or is illegally dumped at the nearest suitable location.

Hazardous waste

The category of hazardous waste in the Republic of Moldova covers only toxic waste and is not compatible with systems used in international practice, e.g. the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal. Toxic waste is divided into four classes according to lethal dosis (LD), where class I is most toxic and class IV least toxic.

The main generator of reported toxic waste is the sector of production of food products and beverages, in which chemicals are used in wine production, mainly in the Causeni District (table 8.5). The situation regarding the treatment of toxic waste is slowly improving as the total amount of this waste stored on site is decreasing, but waste accumulated in the past represents nearly 10 years of waste generation.

Waste from the healthcare sector

Waste generated in hospitals and other healthcare facilities is sorted into categories (table 8.6). Infectious waste is further divided into syringes, needles, perfusion equipment, catheters, scalpel blades, laboratory glass, containers, bandages and used bactericide lamps. Infrastructure for the centralized treatment and disposal of this type of waste is not sufficiently developed yet; thus, every hospital is dealing with generated waste on its own.

Waste sterilization in autoclaves is being introduced and treated waste is disposed of in municipal disposal sites. Thermal destruction of healthcare waste is not a supported method, because incineration in banned by law.

Radioactive waste

Radioactive waste in the country originates mainly from the use of radioactive sources in medical applications, research, education and industry. There is a central facility for long-term storage of radioactive waste that serves the whole country. With the assistance of international donors, the Republic of Moldova has modernized its system of monitoring and storage of radioactive waste.

The most common radioactive waste management practices in the Republic of Moldova are intermediate, long- term storage and transport of radioactive waste. Reconditioning of radioactive waste by cementation into 200-litre drums is planned to be implemented in the near future.

Within a technical assistance project supported by the Nuclear Regulatory Commission (NRC) of the United States of America, an inventory of all available ionizing radiation sources (sealed and unsealed, and associated equipment) was made during 2007–2008 and all necessary data were introduced into the national register of ionizing radiation sources.

Table 8.5: Toxic waste, tons

	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Number of surveyed enterprises	578	709	780	777	816	892	875	886	716	938
Waste generated	1,951	936	835	634	610	756	1,125	404	528	418
Waste utilized	601	576	271	780	1,478	799	594	593	874	571
Neutralized waste	1,056	458	64	264	440	256	36	65	112	51
Transported to disposal site	1,636	132	235	162	202	130	694	61	3	21
Accumulated on site	8,565	7,811	7,897	7,426	6,501	6,530	6,488	6,504	6,087	6,360

Source: Natural Resources and Environment in Moldova, National Bureau of Statistics of the Republic of Moldova, 2010, 2012.

Table 8.6: Healthcare waste, tons/year, 2010

	Republic of Moldova	Chisinau
Surgery and pathology waste	11.14	2.37
Infectious waste	301.89	10.85
Chemical and pharmaceutical waste	3.29	0.00
Radioactive waste	2.62	0.00
Waste similar to municipal solid waste	79.42	1.69

Source: Ministry of Health, 2013.

All those who have an authorization from the regulatory authority to own radioactive materials are obliged to take the appropriate steps to ensure that, at all stages of radioactive waste management, individuals, society and the environment are adequately protected against radiological and other hazards.

Specific waste streams

Materials recovery

Materials recovery from MSW is aimed at plastics, paper and metals. Although there is no national approach to materials recovery, a number of private companies are introducing systems for collection of recyclables. However, the main source of secondary raw material in Moldova is waste from paper or plastic production. Also, several municipalities are introducing separate collection of recyclables in the form of pilot projects.

There are two systems for recovery of recyclables: the traditional system of buy-out points whereby people can sell recyclables (mainly paper and metals), and the newly introduced separate collection (mainly of plastic and PET bottles). In 2010, 55,770 tons of waste paper, 23,530 tons of plastics and 110 tons of glass were recovered from municipal waste.

Other special waste streams

Special waste streams include batteries, tyres, electrical and electronic equipment, waste oils, construction waste and waste chemicals generated by households. Where these types of waste are not separately collected, they may present a threat to the environment. The National Waste Management Strategy for the period 2013–2027 recognizes these waste streams, but also states that the country does not currently have sufficient information on the amounts or fate of them.

In cooperation with foreign donors, the Republic of Moldova succeeded in significantly reducing its stock of pesticides and PCBs; in total, 2,276 tons of chemicals were removed and disposed of abroad in 2007–2012. This figure includes 1,342 tons of pesticides (POPs category or contaminated with POPs from the agricultural sector), 934 tons of old capacitors containing PCBs from the energy sector, and 69,134 tons of laboratory chemical agents collected from 918 undergraduate educational institutions.

In addition, memoranda of understanding were signed in 2011 for the export of 400 tons of pesticides under the project Reducing Environmental Risks from Pesticides in the Republic of Moldova (phases I and II) between the Ministry of Environment and the Czech Development Agency, and for disposal of 200 tons of liquid pesticides in a project financed by the NEF.

8.2 Impact of waste on the environment

Assessment of the impact of the current waste management practice on the environment and human health should be based on well-defined environmental and health protection standards, but these are not applied in the Republic of Moldova. Therefore, the information allowing objective assessment of waste impact on the environment is not available.

Waste disposal sites in the Southern Development Region – the pilot area of the ENPI Waste Governance project– were evaluated and their impact on human health and environment was assessed.

The inventory undertaken in 2011 in this pilot region identified eight urban landfills and 186 rural landfills. The vast majority of landfills do not have a valid permit and are therefore considered illegal/non-compliant. Of these landfills, only two were evaluated as posing a high risk to human health, with most (115) posing only a very low risk. From an environmental perspective, four disposal sites can be judged as posing a high environmental risk, 66 a medium risk and 124 a low risk. This assessment was based on site visits combined with review of site history. From evaluation of site location, type and amount of deposited waste, each site was assigned a high-, medium- or low-risk mark, resulting in indication of high/medium/low urgency for implementing pollution control measures.

Some of these waste dumpsites are functioning based on sanitary landfill authorizations, although they do not correspond to legal requirements for the location and exploitation of MSW dumpsites, being located

near water bodies or localities, or failing to perform maintenance and compaction actions.

8.3 Legal and institutional framework

Legal framework

Since 2005, the legislation on waste management has remained the same. The legal framework for waste management in the Republic of Moldova is based on the 1997 Law No. 1347-XIII on Industrial and Domestic Waste. The Law regulates waste generation by applying norms of waste generation which define maximum allowed generation of toxic waste. These norms have to be approved by the Ministry of Environment and Ministry of Health. Ministries, local administrations and waste generators are required to prepare programmes for waste management based on the National Waste Management Strategy. The local administration is also responsible for preparation of registers of disposal sites, including their characteristics, and reports this information to the Ministry of Environment.

Furthermore, this Law defines requirements for minimizing the impact of waste management on the environment by implementation of clean technologies and by disposal of waste only on permitted developed sites. Import of waste (except for recyclables) and waste incineration are forbidden. Development of waste management infrastructure should be financed from the State budget, from the budget of the local administration, by waste generators and from environmental funds.

The Law defines fees on waste delivered to disposal sites or stored on company premises (table 8.7). Fees are defined as coefficients multiplying the minimum wage. If the waste amount exceeds that defined by norms on waste generation, the fee is increased fivefold. These fees constitute the income of the environmental funds.

This key legislative norm for the regulation of waste management reflects the situation in the country at the time it was adopted by the Parliament and does not support the introduction of modern methods of waste management. It covers the main issues relating to environmental protection policy, minimizing the impacts of waste on the environment, and reporting. However, it lacks regulations which set standards for the operation of facilities. Also, the general ban on incineration of waste is in contradiction with international practice. A new waste law was drafted by the Ministry of Environment and was going through the approval process by the parliament in the first quarter of 2013.

The 1993 Law No. 1515-XII on Environmental Protection empowers the Ministry of Environment to develop waste management policy; to carry out the State control aimed at verifying the compliance of individuals and legal entities with waste management legislation; to issue and withdraw permits for waste management activities; and to perform expert evaluation of programmes, schemes and projects in the waste management sector.

Table 8.7: Fees on waste disposal and storage, coefficient/ton

	Disposal	Storage
Non-toxic waste	0.06	0.00
Toxic waste		
Class I	20.00	5.80
Class II	6.00	1.80
Class III	2.00	0.60
Class IV	1.00	0.30

Source: 1997 Law No. 1347-XIII on Industrial and Domestic Waste.

The 1996 Law No. 851-XIII on Ecological Expertise and Environmental Impact Assessment included waste management facilities in the list of objects which must undergo the process of environmental impact assessment (chapter 2). There is no evidence that any EIA was carried out for a waste facility in the country.

The 2001 Order of the Minister of Environment and Spatial Planning No. 67 approved the Master Plan for Construction of Solid Waste Landfills, developed by IPROCOM, a design institute which designed several disposal sites in the Republic of Moldova. This Master Plan was prepared in accordance with the requirements of normative and legal acts in construction and environmental and human health of the Republic of Moldova. It contains technological and technical solutions for landfill construction for settlements, divided into three categories according to population (3,000 to 5,000; 10,000 to 15,000; 20,000 to 30,000) and also defines the landfill lifespan at 20 years, from which landfill size and capacity, number of machines and mechanisms necessary for operation, and number of staff is derived.

The 2008 GD No. 1296 on environmental payments on import of goods which in the process of use cause environmental pollution and on imported plastic and tetra-pak packaging, introduced the producer-responsibility principle.

Transboundary movement of waste

The Republic of Moldova, as a small country lacking hazardous waste processing facilities, is applying the practice of exporting hazardous waste to facilities abroad for safe disposal under the framework of the Basel Convention. Incorporation of the Basel Convention to the legal system of the Republic of Moldova was achieved through 1998 Parliamentary Resolution No. 1599-XIII on accession of the Republic of Moldova to the Basel Convention, later supported by: the 2003 GD No. 637 on streamlining control of transboundary waste transportation and disposal; the 2008 Law No. 205-XVI on the Acceptance of the Amendment to the Basel Convention, including Annex VII; and the 2009 GD No. 81 on regulation of PCBs.

Radioactive waste legislation

Radiation protection in the Republic of Moldova is based mainly on the 1996 Law No. 111-XVI on Safe Deployment of Nuclear and Radiological Activities, and fundamental radiation protection norms – requirements and hygiene rules in force from 2000. The 2006 Law creates the framework for management of radioactive materials, including for management of waste generated from them. It is further supported by the following secondary legislation:

- 2008 Regulations on the National Registry of Radiation Sources (GD No. 1017);
- 2008 Regulations on State supervisory control and supervision of nuclear and radiological-safety activity (GD No. 1220);
- 2009 Regulations on authorization of nuclear and radiological activities (GD No. 212);
- 2009 Regulations on radioactive waste management (GD No. 388).

The 2009 Regulations on radioactive waste management classifies radioactive wastes by their aggregate state (liquid or solid) and specific activity, as well as by level of contamination. Since 2010, the Republic of Moldova has been party to the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management.

Policy framework

There is no national policy on waste management in the Republic of Moldova approved yet, but the Ministry of Environment prepared a draft national waste management strategy which was approved by the parliament in 2013.

National Waste Management Strategy

The National Waste Management Strategy for the period 2013–2027, approved in 2013, describes the current situation in the Republic of Moldova, projects future development of waste management and defines strategic waste management goals until 2027. The strategy has been prepared in line with the principles of EU waste management policy. It presents a realistic view of the current situation regarding generation, collection and disposal of municipal waste and, partially, of industrial waste – as hazardous waste includes only toxic waste, and both construction waste, and healthcare-generated waste volumes are estimated.

Forecasts of waste generation indicate the continuous increase of MSW, which should increase fourfold by 2027. A similar increase is also projected for industrial waste. Hazardous waste is estimated to remain stable, at about 5,000 t/year. General objectives of the draft strategy are:

- Development of integrated municipal waste management systems by harmonizing the legal, institutional and regulatory framework to the EU standards based on a regional approach and territorial division of the country into eight waste management regions;
- Regional infrastructure development for MSW disposal and transfer stations;
- Development of collection systems and treatment of specific waste streams, such as packaging, electrical and electronic equipment, tyres and batteries, by promoting and implementing the principle of producer responsibility, including hazardous waste (medical waste, oils, etc.), with one collection point per region.

These general principles are further transformed into specific objectives and implementation measures for each waste stream. Initial estimation of the costs of implementation of measures aimed at improving municipal waste management in the period 2013–2027 are estimated at €375 million to €470 million. Sources of financing this estimated investment in waste management modernization are not identified. It is important to secure such financing to enable full implementation of the Strategy. Besides traditional methods of financing from the country's own resources and international donors, public–private

partnership (PPP) could be considered based on design-build-operate contracts. PPP contracts would bring added value for the Republic of Moldova. Private companies can bring expertise in development and operation of waste management infrastructure.

Institutional framework

The Ministry of Environment is responsible for waste management policy and planning at the national level. Despite increasing focus on modernization of the waste sector, the number of core staff in the Ministry's Department of Pollution Prevention and Waste Management dedicated to the sector remains low – two persons directly responsible for waste management and two for chemicals management and industrial accidents. However, for individual waste management projects (currently the ENPI Waste Governance project and, earlier, the POPs Management and Destruction Project), separate offices were established before 2005, subordinated to the Ministry of Environment. These offices cooperate with the core staff of the Ministry.

Although the current number of staff can cope with interministerial communications and preparation of legal and strategic documents in cooperation with project staff, communication with subordinated regional and district bodies is not effective. The Department lacks capacity to systematically process and evaluate information from districts on implementation of waste legislation.

Responsibility for financing investments in waste management infrastructure is shared among the Ministry of Finance, Ministry of Economy and Ministry of Environment, which provides co-financing from the National Environmental Fund.

The Ministry of Health is responsible for management of waste generated in healthcare facilities and for categorization of toxic waste. The State Sanitary and Epidemiological Service of Public Health has a good understanding and overview of the situation regarding healthcare waste management in the country.

Pursuant to the 2006 Law No. 111-XVI on Safe Deployment of Nuclear and Radiological Activities, the National Agency for Regulation of Nuclear and Radiological Activities was established in 2007. The Agency is a single regulatory authority on radiation protection and safety under the Ministry of Environment, as a separate legal entity with independent structure and budget. It is also responsible for operation of the Radioactive Wastes Storage Facility in Chisinau and for permitting and monitoring of this waste.

The Radioactive Wastes Storage Facility is the only operator authorized for long-term storage of radioactive wastes and disused radioactive sources. It also has authorization for the collection and transportation of radioactive wastes and other radioactive materials on specialized transport by road. The Facility was created in 1960 as a "Radon" type, being initially designated for storage of solid, biological and liquid low- and intermediate-level radioactive wastes. Its old "Radon" facility has not been used since 1990 and will be decommissioned, but the date has not yet been set. First, a safety assessment of the "Radon" facility has to be performed. The light terrestrial facility will be used for storing decommissioned and reconditioned wastes. At the moment, all disused radioactive sources and received wastes are kept in terrestrial storage for high-activity spent sources.

International projects

International donors finance several waste management projects in the Republic of Moldova. These are aimed at targeting the most critical problems of improper storage of hazardous waste as well as introducing modern waste management practice.

EuropeAid is currently implementing the ENPI Waste Governance project for Azerbaijan, Armenia, Belarus, Georgia, the Republic of Moldova, the Russian Federation and Ukraine. The project started in December 2009 and is due to end in December 2013. Its purpose is aimed at improving waste management through the promotion of higher standards at waste facilities, more effective waste prevention initiatives, and increased capacities for waste collection and sorting, as well as increasing the reuse, recovery and safe disposal of waste. A pilot region in each country has been selected, where an inventory of illegal disposal sites was compiled and a new regional waste management strategy was prepared. Activities at the national level include strengthening of waste classification and, at the international level, focus on increased cooperation between participating countries and international donors. In the Republic of Moldova, the Southern Development Region, representing 15 per cent of the population, was selected for implementation of the ENPI Waste Governance project.

Another programme currently under implementation is the Technical Support on the Development of a National Healthcare Waste Management Strategy,

financed by GAVI Alliance (formerly the Global Alliance for Vaccines and Immunisation). This project will result in adoption of a national policy on healthcare waste management and will develop a national strategy and plan for implementation of the policy.

The Agricultural Pollution Control Project, under the World Bank–GEF Strategic Partnership for Nutrient Reduction in the Danube River and Black Sea and implemented in 2004–2008, was aimed at reducing nutrient pollution of the Danube River and Black Sea from agricultural sources in the Republic of Moldova. The project assisted the Government to improve management of manure and similar agricultural waste by the development of insulated platforms for the storage of manure. The project targeted Hincesti, Negrea, Lapusna and Carpinenei districts.

Renewable Energy from Agricultural Waste was implemented in the period 2005–2008 and resulted in the installation of eight straw-fuelled boilers, in cooperation with the Ministry of Agriculture and Food Industry. Although this project aimed for incineration of 2,750 tons of straw per year, its importance is in opening a new market for renewable energy in the country. Two companies started production of boilers fuelled by straw and a new project financed by the EU was prepared.

The POPs Management and Destruction Project implemented in the period 2006–2010 covered the whole country. With financial support from the GEF, 1,150 tons of obsolete pesticides, stored in 12 warehouses, were incinerated in a licensed facility abroad.

The TACIS Cross Border Action Programme in 2006 and 2008 assisted in improvement of municipal waste management through the support of separate collection and disposal practices in the municipalities of Leova, Falesti, Cahul, Cantemir, Hincesti, Edinet, Cupcini and Anenii Noi.

8.4 Conclusions and recommendations

The current Law on Production and Consumption Waste is outdated, and although a draft law on waste management was prepared, its adoption is delayed. In combination with the new National Waste Management Strategy, this draft law is urgently needed to define new standards and strategic priorities for future waste management and introduce modern waste management principles in the Republic of Moldova. The new law is expected to introduce new duties and responsibilities, which require strong institutional support, otherwise its implementation will be limited.

Recommendation 8.1:
The Government, in cooperation with local authorities, should work on:

- *(a) Promoting the adoption of the law on waste management by the parliament;*
- *(b) Developing the relevant secondary legislation to implement the internationally recognized waste management priorities and good practices;*
- *(c) Implementing the 2013 National Waste Management Strategy.*

Recommendation 8.2:
Once the law on waste management has been adopted, the Government should strengthen the central national authority dealing with waste management, enabling it to support the implementation of the law and the National Waste Management Strategy.

Although an efficient system of waste statistics has already been introduced, classification of waste is not in line with international practice, such as under the Basel Convention and EU norms, especially in the definition of hazardous properties of waste. The current system still uses four toxic waste classes which are not in accordance with international practice.

Recommendation 8.3:
The Ministry of Environment, together with the National Bureau of Statistics, should implement waste classification based on the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal, together with new reporting forms, taking into account the relevant EU waste classification.

The private sector in waste management is developing, especially in collection and processing of secondary raw materials. However, cooperation between traditional municipal waste schemes and new private initiatives is not optimal. There is a space for benefiting from private activities by the creation of public–private partnerships in the modernization of waste management, especially in Chisinau.

Recommendation 8.4:
The Government should secure funding for the implementation of the 2013 National Waste Management Strategy and investigate involvement of the private sector by forming public–private partnerships in waste management.

Disposal of waste in the Republic of Moldova urgently needs improvement. The main problem is the lack of standards for operation and monitoring of disposal sites. This leads to weak governmental supervision of waste management. The basic tool for regulation of the operation of waste disposal sites is operating permits, but these are not used in the country.

In addition, the current temporary dumping of municipal waste at the site near the transfer station in the vicinity of Chisinau may result in severe environmental problems. Finding an appropriate, environmentally and socially acceptable solution to permanent safe disposal of waste generated by Chisinau should be a high priority of waste management in the Republic of Moldova.

Recommendation 8.5:
The Ministry of Environment should introduce regulations for the operation and monitoring of waste disposal sites and introduce procedures for issuing permits for operation of disposal sites based on those regulations and EIA requirements.

Chapter 9

BIODIVERSITY AND PROTECTED AREAS

9.1 Trends in species and ecosystems

Threatened species

Biodiversity trends in the Republic of Moldova are alarming for species groups for which there is available data (table 9.1). In comparison with 1990, the threat factor to all major animal species groups has increased, putting several species close to extinction in the country. Unfortunately, data are very fragmentary, e.g. for plant groups, only data on trends for lichens are currently available. Interestingly, the total number of species for lichens as well as for mammals seems to increase between 2005 and 2010, whereas for all other species groups (amphibians, reptiles, fish, invertebrates, birds, vascular plants and mushrooms) they remain constant.

Of six mammal species included in the Red Data Book of 2001, there is an improvement in numbers reported for otter (*Lutra lutra*) and wild cat (*Felis silvestris*), but poaching still remains the main danger. The European mink (*Mustela lutreola*) and the steppe polecat (*Mustela eversmani*) remain in a difficult situation. Of the 14 amphibian species, the following populations are reported to have reduced by 2.5 to 3 times in recent years: *Pelobates fuscus, Triturus cristatus, Bombina bombina, Bombina variegata, Hyla arborea.* Of reptiles, special attention is noted for the endangered species: steppe viper (*Vipera ursin*), four-striped snake (*Elaphe quatorlineata*), and multi-coloured lizard (*Eremias arguta*).

As for bats, the deficiency of data is underlined, making an assessment of the state of species difficult. However, three new species for the country have been discovered in the reporting period. All of the 21 bats found in the Republic of Moldova are considered rare and are protected by national legislation.

The main conclusions of a long-term assessment (1970–2010) by the Zoological Institute of the Academy of Sciences of the Republic of Moldova (ASM), comparing the trends and status of 129 bird species are:

- Absolute species numbers of breeding and migrating birds have declined due to a decline in suitable wetland habitats;
- Diversity and abundance of wintering birds are growing due to the increasing occurrence of a mild winter;
- The number of Podicipediformes and Gruiformes has noticeably reduced;
- Species representing the southern fauna, e.g. *Egretta alba*, extend northwards.

An update of the Red List is under preparation and is expected to be published by the end of 2013.

Endemic species

Due to the country's location at plant and animal geographic crossroads, there are only a few species that are endemic to the Republic of Moldova. Data trends for endemic species, e.g. *Genista tetragona*, are often unknown and need updating according to the International Union for the Conservation of Nature (IUCN) Red List of Threatened Species 2012.

Invasive species

The Fourth National Report to the Convention on Biodiversity (CBD) recognized about 150 species of invasive animals as well as about 460 invasive plant species. Of the invasive plant species, about 130 species are damaging crops, and 15 species are damaging trees. It was found that annual losses in agriculture that are caused by invasive species are from 5 to 10 per cent of cereal crops, 15.2 per cent in weeding plants and 25 per cent of multicultures.

According to the IUCN Invasive Species Database (2012), there are 61 invasive species (primarily plants, fish and insects) listed in the Republic of Moldova, six of which are exotics. Alien species reported as having a significant impact are: raccoon dog (*Nyctereutes procyonoides*), sika deer (*Cervus nippon*), golden jackal (*Canus aureus*), fall webworm (*Hyphantria cunea*) and the neophytes *Grindella squarosa*, *Ambrosia arimisilfolia, Xantium albinum*, *Abutilon theophrasti* and *Mirabilis nyctaginea*. In aquatic ecosystems, there are two invasive species of clams: *Ferrissia fragilis* and *Sinaodonta woodiana* are newly reported in Moldovan rivers.

Table 9.1: Some trends in biodiversity

	Status	2005	2010
Lichens	Total number of species	124	196
	Critically endangered	3	7
	Endangered	7	15
	Vulnerable	6	49
	Number of protected species	16	16
Fish	Total number of species	80	80
	Critically endangered	1	3
	Endangered	5	8
	Vulnerable	3	8
	Number of protected species	12	18
Birds	Total number of species	210	210
	Critically endangered	29	38
	endangered	8	12
	Vulnerable	2	7
	Number of protected species	39	39
Mammals	Total number of species	14	21
	Critically endangered	9	11
	Endangered	2	4
	Vulnerable	3	6
	Number of protected species	14	14

Source: Ministry of Environment, 2013.

In the forestry sector, box elder (*Acer negundo*) and black locust (*Robinia pseudoacacia*) have become dominant in some areas (e.g. in the meadow forests in the valleys of the Dniester and Prut Rivers), displacing native tree species, and are considered to present a significant danger to the ecosystems. Black locust, however, is largely preferred by the local population as a fuel wood (and continuously afforested), whereas annual plans exist for box elder extraction from the natural forest ecosystems. The removal of such species is questionable. The same is true for Russian olive (*Elaeagnus angustifolia*), which is reported to have taken over the steppe landscape of Gagauzia but is a typical floral element for steppes and semi-deserts in Eurasia.

Interestingly, hornbeam (*Carpinus betulus)* is also repeatedly regarded as an invasive species and particularly harvested with the excuse of "ecological forest reconstruction". This perception, however, lacks any basis, as the territorial region of the Republic of Moldova is fully covered by the ecological range of hornbeam and it is a natural representative of the typical forest type in the region.

Ecosystems

Steppe

Only about 2 per cent of the country's grassland ecosystem is still covered by natural or semi-natural habitats. This low percentage is additionally fragmented; intensive agriculture has pushed the ecological integrity of steppe habitat to its limits. Currently, natural steppe communities have been preserved only in small and isolated areas; five protected areas (PAs) preserving steppe vegetation exist (Bugeac, Dezgingea, Vranesti, Andriaşevca and Ciumai-Vinogradovca), with a total area of 148 ha, less than 1 per cent of the country's surface. This figure is regarded as too low to protect the gene pool of steppe plant communities in the Republic of Moldova. The biodiversity of the steppe has been particularly altered and affected due to intensive grazing, soil erosion, soil salinization and intensive use of fertilizer.

Even the basic steppe plant species have become rare. Of about 500 steppe and rock-steppe plant species, approximately 140 species are rare; 40 species were included into the 2001 edition of the Red List of the Republic of Moldova. Recent figures are not yet available.

Wetlands

Since 2005, wetlands have received significant attention, reflecting the economic and ecological importance of the ecosystem. The designation of three wetlands of international significance – Ramsar sites (Lower Prut Lakes of 19,152 ha, Lower Dniester of 60,000 ha and Unguri-Holosnita of 15,553 ha) – offers the chance for increased species and habitat conservation measures. Nevertheless, the active restoration of riparian forest and wetland remains one of the major ecological tasks with on-the-ground

implementation only starting recently and still being mainly project driven. Excessive agriculture and pasturing practices still lead to strong degradation and plant and animal species' shift and disappearance.

A wetlands ground survey has shown that the number of migrating and nesting birds fell recently, although the species composition remained on the same level. Wetlands bird species such as *Crex crex, Porzana porzana, P. pusila* and *P. parva*, of concern entirely throughout Europe, also became rare in the Republic of Moldova and were included in the Red Data Book. Rivers and creeks are one of the most important habitats and lifelines and thereby indispensable for the implementation of the ecological network. Both the Lower Prut Lakes Ramsar site and the strict reserve Padurea Domneasca ("Lord's Forest") were included in the international Danube River Basin Management Plan.

Forest

In the Republic of Moldova the forest is highly fragmented and unevenly scattered throughout the country; concentration of forest occurs in the central part of the country. The forest comprises about 800 single patches extending between 5 ha and 5,000 ha.

As of 2010, some 375,000 ha of the Republic of Moldova were covered with forest on Forest Fund lands, which cover roughly 12 per cent of the territory of the country. Of Forest Fund lands, 87 per cent are State property, 12 per cent are municipal forest and 0.6 per cent are private forest. Additional to the Fund, about 49,000 ha of "forest vegetation" exists as protection belts located on agricultural land, in river and water basin protection areas, and as tree and shrub plantations along roads.

The last 10 years saw an increase in forested area from 10.3 per cent in 2002 to 12.1 per cent in 2010 and a targeted 13.2 per cent in 2015.

Between 2007 and 2010, the Agency "Moldsilva" undertook several activities to restore or establish forest/wooded lands. Activities for forest regeneration (reforestation of trees) on National Forest Lands (NFL) took place on about 3,500 ha. In addition, some 20,000 ha of degraded sites, not previously forested, have been afforested as an approach to combating desertification and erosion as well as to provide alternative fuel wood sources (although the rotation scheme seems very long, at 30 years). On some 10,000 ha of the NFL, "natural regeneration" was supported (table 9.2).

The major tree species, either for restoring forest or for afforesting degraded sites, is black locust/acacia (*Robinia pseudoacacia*). Whereas this can be regarded as sensible on degraded and eroded sites, and also in combination with alternative income (honey production), it is ecologically questionable for the restoration of forest stands. Only some 700 ha of oak (*Quercus robur*) have been established; other typical regional forest species including hornbeam, maple, beech and lime are entirely absent.

The history of black locust plantations goes back into the second half of the twentieth century, when vegetative regeneration and reforestation with acacia had already become the principal directions of forestry. Also today, "supporting works for natural regeneration" of forest does mean that up to 80 per cent of these works are conducted by cutting and enabling root suckering of acacia. Against this background, the entire concept of "natural regeneration/ecological restoration", also called "natural reconstruction", should be defined clearly. Whether root sucks, appearing after commercial cutting practice, should be reported as "natural regenerations" of forest seems questionable. There is a similar lack of clarity in the case of "sanitary felling/cutting", a term which leaves space for misinterpretation and is not solely used for describing improvements in the condition of forest stands by taking away infected, damaged, dead and perishing trees. About 90 per cent of the NFL is considered to be category I of forest classification, meaning it has a primary protection and not a production value. In 2007, a "List of criteria and indicators of sustainable management" for forest ecosystems was developed and approved by the Government to address this importance.

The average age of the most important tree species is: for beech, 90 years; for oak, lime tree, hornbeam and ash, only about 50 years. Trees older than 100 years cover only 6,000 ha (out of about 375,000 ha). As these old-stand forest clusters are missing, also within PAs, is a statement that all forest on the Republic of Moldova plains is largely man-made, which has led to its rather poor structure. Consequently, the forest has difficulty resisting pathogenic and abiotic factors. About 1,500 ha of beech forest (70 per cent of all national beech forest stands) are currently preserved within nine PAs. Although beech occurs in the Republic of Moldova at the south-eastern edge of its distribution, the central part of the country – with elevation of about 450 m and sufficient precipitation – should be covered by more beech forests, yet intensive forest use over the last 200 years did not allow forest succession to reach this state.

Table 9.2: Forest regeneration and afforestation

Year	Forest regeneration on the areas managed by Agency "Moldsilva", ha			Extending forest cover on new territories, ha (4)	Total regeneration and afforestation, ha (3+4)
	Forest planting (1)	Helping natural regeneration (2)	Total (3)		
2007	1,026	2,870	3,896	7,550	11,446
2008	976	2,683	3,659	7,932	11,591
2009	759	2,843	3,602	4,670	8,272
2010	685	2,072	2,757	529	3,286
Total	**3,446**	**10,468**	**13,914**	**20,681**	**34,595**

Source: Botnari, F., D. Galupa, I. Platon et al. State of the Forestry of the Republic of Moldova 2007–2010. Agency "Moldsilva". 2011.

Photo 9.1: *Iphiclides podalirius*, included in the Red Book of the Republic of Moldova

Up to 90 per cent of the Republic of Moldova's harvested wood is provided for fuel wood consumption. In principle, the country is a heavy net wood importer, mainly of timber and construction wood.

Of 37 European countries participating in the European Forest Survey 2011, the Republic of Moldova was the country with the fewest key forest parameters available or provided. Less than 40 per cent of the required data could be provided, with most interesting data on ecology and the forest and forestry economy (e.g. volume of marketed wood and services, dead wood ratio) lacking. As new forest inventories are not yet implemented and updated nationwide (only scientific reserves are covered), it seems that necessary data are not available for sound assessment and management.

9.2 Trends in development and management of protected areas

Development of protected areas

Long-term targets related to ecosystem functioning and conservation of biological diversity are provided in the 2005 First National Report on Millennium Development Goals in the Republic of Moldova. Targets include an increase of PA coverage from 2.1 per cent of the country's territory in 2006 to 2.4 per cent in 2015. In 2007, when the country chose to add the coverage of the wetlands of international

importance (Ramsar sites) to the national coverage (adding 94,705 ha), the target was more than reached, standing at 4.65 per cent. The three Ramsar sites are:

- Lower Dniester (Dniester de Jos), established in 2003: 60,000 ha;
- Lower Prut Lakes, established in 2000: 19,152 ha;
- Unguri-Holosnita, established in 2005: 15,553 ha.

Only the Ramsar site of Lower Prut Lakes is based on an existing wetland PA (Lower Prut or "Prutul de Jos" Scientific Reserve). Unguri-Holosnita and Lower Dniester are actually not PAs of national category. Since 2008 the submission of a proposal to the Ramsar Secretariat for the designation of Padurea Domneasca as a new (fourth) Ramsar site in the Republic of Moldova has been pending due to internal governmental negotiations.

The protected territory in the country remains highly fragmented into a total of 312 PAs, with landscape reserves and scientific reserves constituting the largest coverage with 52 per cent and 29 per cent of the PAs respectively. An ongoing UNDP/GEF project aims to establish the first national park, with a coverage of about 34,000 ha, in the Orhei region, the central part of the country. It is expected to be established in 2013.

Its IUCN category would be V (landscape reserve) due to the widely occurring land use within its boundaries and it having a core zone which only encapsulates about 1,000 ha of mainly oak-dominated forest with low forestry impact in the past. In any case, if implemented, the site would represent the first real enlargement of PAs in the country. Pestera Surprizelor Cave was given PA designation in 2008 in order to stop the pressure on the existing bat population living in the cave.

One of the most important national initiatives is the establishment of a National Environmental Network (NEN), which is seen as supporting solutions to many ecological problems such as the lack of viable habitats and PA fragmentation. Although there is reference made to this initiative many times, site selection has not been finalized yet.

The 2012 GD on the establishment of a government commission on the expansion of the area of forest vegetation is expected to ensure the development of a national plan to increase the area of forest vegetation. About 12,000 ha of degraded land available for reforestation, including groundwater protection zones and riparian zones, have been proposed so far.

Within the framework of the Danube River Basin Management Plan, the Republic of Moldova has expressed strong interest in establishing a trilateral biosphere reserve between the Republic of Moldova, Romania and Ukraine; trilateral talks on the issue started in 2010. In 2012, a joint project proposal aiming for establishment of the trilateral Biosphere Reserve, covering an area from the Lower Prut Scientific Reserve in the Republic of Moldova to the Danube delta (in Ukraine) was submitted to the European Commission.

The Republic of Moldova has placed two sites on the national tentative list for inscription to the UNESCO World Heritage List: the Cultural Landscape Orheiul Vechi in 2007 and the Typical Crernozem Soils of the Balti Steppe in 2011.

Management of protected areas

Currently, there are 12 categories (eight according to IUCN criteria and four according to national criteria) of PAs in the Republic of Moldova. There are numerous action plans and strategies to improve the management of PAs, yet still pending are timely spatial priorization with a focus on Moldovan representative ecosystems, simplification of national PA categories to achieve consistency with international criteria, and integration with European PA networks.

Particular attention is paid to scientific reserves. Scientific reserves protect the last remaining natural and nearly natural forest in the country, have administration in place, and offer research and education possibilities. Scientific reserves (e.g. the Lower Prut Scientific Reserve) have management plans, although these are not prepared according to IUCN definitions and recommendations. Guidelines for management plan development are expected to be introduced, legalized by an order of the Ministry of Environment, by the end of 2013.

The need for improvement of governance and management of PAs is well recognized throughout the country. The key obstacles to successful PA management, as defined by the Ministry of Environment, are as follows:

- Legal contradictions in institutional arrangements (e.g. between the Ministry of Environment and the Agency "Moldsilva" in management of scientific reserves);
- Weak implementation of legislation regarding PAs;
- Insufficient institutional capacity to ensure the appropriate management of PAs;

- Lack of cooperation between governmental institutions;
- Lack of sustainable funding;
- Weak collaboration between local public authorities and central environmental authorities;
- Insufficient capacity and resources at the national, local and site levels for planning, management, monitoring and reporting on landscape reserves, natural monuments and other local PAs;
- Weak coordination of scientific programmes and biodiversity rehabilitation.

As many of the PAs are forested and therefore fall under the NFL, the Agency "Moldsilva" is responsible for managing these areas. Only State national reserves have staff for their management. Management plans are not available for most PAs in the country, although a standard form and template exist.

The 2012 Action Plan for Implementing the Programme of Work on Protected Areas recognized a significant deficit in funding national PAs: the estimated financing of PAs in the Republic of Moldova for the period 2008–2009 amounted to about US$1.3 million, which did not exceed 45 per cent of the amount necessary for basic management. Owing to a lack of State budget financing for PAs, the Agency "Moldsilva" has to cover major costs of PAs management from its own resources (mainly resulting from wood/timber management).

The condition of landscape reserves (a regional PA category), representing about 20 per cent of the surface of PAs, is bad, as local responsibility for conducting at least basic monitoring and reporting is not yet fulfilled.

9.3 Pressures on species and ecosystems

The lack of viable habitats of significant size, providing the required space for in situ conservation, is certainly the most significant threat to biodiversity in each of the country's ecosystems. The status of flora diversity, in particular in steppe ecosystems, remains unsatisfactory throughout the country due to intensive agriculture.

The consequences of intensive land use remain unchanged in comparison with 2005. These include erosion and landslides, conversion of steppe, soil salinization and drainage of wetlands, or improper grazing management. Nonetheless, the steady development of organic agriculture is leading to the creation of favourable conditions for biodiversity conservation.

Threats to, as well as challenges for, biodiversity conservation are well understood in the country, with a wide range of national strategies addressing this. Yet, without appropriate law enforcement (e.g. on illegal hunting and logging) and the implementation of a strict penalty system, the pressure on ecosystems and species will remain high.

Land uptake

Since 2005, the pressure from land uptake has remained constant. Certainly, intensive agriculture is still having the biggest impact, although there has been no extension of agricultural areas. The areas affected by soil erosion remain at the same level, with about 900,000 ha affected. The Republic of Moldova does not have mineral deposits, although some oil and gas deposits have been identified.

Habitat fragmentation and human barriers for migratory species

The biggest obstacle for migrating animal species is still the isolation of areas. Improvement for migration on a national scale is hampered by the continuous degradation of forested strips and hedges between agricultural fields. Restoration falls under the responsibility of the Ministry of Agriculture and Food Industry, which prioritizes the consolidation of small-scale land plots before starting to restore hedges.

Within the reporting period, the pressures on wetlands have remained the same: drainage; lateral and longitudinal alteration of the hydrological system by construction of dams, dykes and embankments; nutrient pollution; overgrazing; and intensive, illegal fishing. The wetlands near the Dniester and Prut Rivers are mainly disconnected from the rivers, which has reduced the functionality of the floodplain. Destruction of riparian forest has decreased the water retention potential, leading not only to water deficits but also to higher risk and intensity of floods.

Although the disrepair and decline of hydrotechnological installations led to a partial and spontaneous restoration of some wetlands, there has not been any institutionalized effort to promote and secure this process, which is beneficial for nature conservation. On the contrary, in 2008, a railway project was realized: construction of a railway dam through Manta Lake wetlands (part of the Lower Prut Lakes Ramsar site) without considered assessment of the environmental impact. As a result of the project,

seasonal migration of the main fish species of the Prut River has been hampered. Besides ongoing oil extraction on Beleau Lake (part of Lower Prut Scientific Reserve), the construction and operation of an oil terminal some 15 km downstream of Beleau Lake is further expected to have an adverse impact on biodiversity in the area.

For decades, the hydrological dams on the Dniester and Prut Rivers have been barriers for fish migration. This leads to a decline in numbers of fish and a loss of spawning grounds. Of the 85 reported fish species in the Dniester River, the national Fisheries Service reports that only between 45 and 50 are frequently found and it predicts an increase in only three to four fish species will be listed in the next edition of the Red Data Book. The Fourth National Report to the Convention on Biological Diversity states a considerable reduction in the number of species of nesting aquatic and fenny birds due to droughts and degraded wetland vegetation (reeds). Being deprived of food on grasslands, these birds are forced to use the reeds of coastal lakes and ponds growing at the edge of swamps, thus destroying the habitats of many wetland birds such as *Gallinula chloropus*.

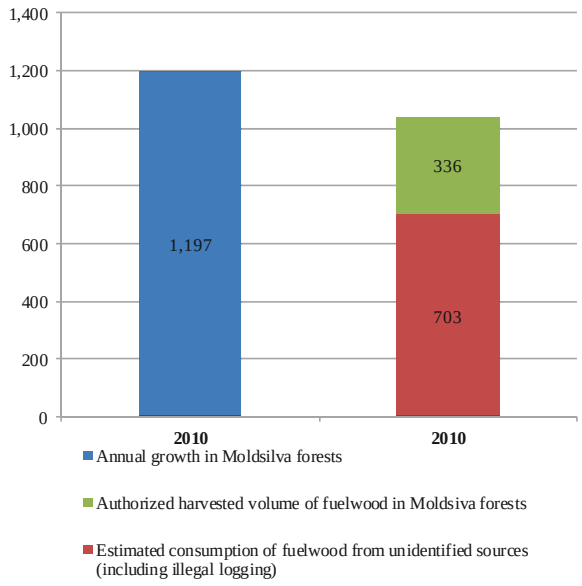
Logging and deforestation

In 2011, in an analytical study, the Agency "Moldsilva" presented a critical assessment of the logging situation in the country. The scale of illegal logging of all types of forest had become a serious problem.

The amount of timber harvested officially between 2006 and 2010 remained more or less stable, ranging between 410,000 m³/year and 440,000 m³/year, with about 90 per cent being fuel wood. Officially, all sites affected by logging were fully covered with regeneration works. At the same time, the estimated volume of wood consumed in the Republic of Moldova amounts to up to 1.04 million m³/year (figure 9.1), with about 75 per cent being fuel wood. The consumption of fuel wood is very high due to a lack of alternative fuel supply, and almost matches the annual growth in the forest. Due to this high turnover, the forest in fact has no chance to become old and therefore the capacity for increased biodiversity value is weakened.

According to official data, in 2010, the volume of illegal logging was about 16,000 m³ in community forests, protection belts and other lands covered with forest vegetation outside the NFL, and about 4,000 m³ in forests managed by the Agency "Moldsilva". Besides controlling the Agency "Moldsilva", the State Ecological Inspectorate (SEI), according to the 2007 Law on Plants ("law on vegetal kingdom"), controls and inspects forestry actions, including illegal actions. Nonetheless, enforcement remains low, with many illegal actions not traced. As fines for illegal cutting are lower than permits for official harvesting, there is no incentive for prevention. An updated Forest Code has been prepared. It will reinforce penal provisions for illegal cutting, but has not yet been adopted.

Figure 9.1: Fuel wood growth and harvest, thousand m³, 2010



Source: ENPI FLEG. Moldovan Forests: Wood Harvesting and Consumption. 2011.

There is no national programme specifically dedicated to the restoration of riparian forest for flood prevention or drought mitigation. Apart from that in protected areas, riparian forest is not part of the NFL, thus, supposedly, it has to be managed by local authorities and/or communities. As for most community forest sites, the conditions are reported to be very bad and unsatisfactory, due to intensive exploitation.

Soil degradation

Soil degradation has increasingly become a problem in the country, with about 40 per cent of the land affected by erosion and about 112,000 ha at risk of desertification. Every year, soil erosion expands by about 7,000 ha. Besides the natural causes such as geological structure and precipitation runoff, bad agricultural practices (ignoring crop rotation and returning organic material to the land) are the main cause of soil degradation.

Intensified agriculture

The pressure on steppe is reported to have continued. One of the reasons for this is the rather stable number of sheep and goats reared by private households in steppe regions.

The health condition of many forest stands worsened considerably in recent times. The average annual surface of forests damaged by defoliating insects constitutes 50,000 ha to 70,000 ha (16 to 22 per cent of the area occupied by forests). This area has to be subject to some active measures of control every year. Whereas overgrazing led to the concrete example of water chestnut (*Trapa natans*) disappearing in the Orchard Turcescă protected area, overfishing, in combination with water and soil pollution due to agricultural activities, is reported to have led to a decrease in fish resources and consequently a decrease in bird numbers.

Hunting and fishing

Poaching of birds appears to be the biggest threat to migratory bird species in the Republic of Moldova. Almost all State-owned forests are hunting grounds. The Agency "Moldsilva" manages more than 300,000 ha of hunting land. A total of 9,400 ha of forest lands managed by the Agency are leased to legal persons based on public tenders. This is a new approach based on the 2008 regulation on forest rent for hunting management and/or recreation and seen as an improvement in wildlife sector management. An improvement in the dynamics of the main species of animals and birds of hunting interest is reported for 2010 in comparison with average figures for the previous decade. Fish resources have suffered fundamental changes, leading to a nationwide decrease in the number of valuable species. The Costesti-Stinca reservoir indicates a significant reduction in fishery resources in recent years. Manta and Beleu Lakes, formerly linked to the Prut River, are now disconnected, resulting in their constantly decreasing importance for the reproduction and growth of valuable species. Currently, fish species without economic value (e.g. bleak, 14 per cent; pig, 8 per cent; tube-nosed goby, 7 per cent) prevail.

Collection of non-wood forest products

Non-wood forest products (NWFP) have their share in the revenues from forest exploitation. The enterprises owned by the Agency "Moldsilva" make up the majority of the NWFP harvest, which includes the production of, for example, pheasants (up to 5200 heads in 2010). Volumes of other NWTP are presented in table 9.3.

In principle, the Botanical Institute and the Forest Research and Management Institute set quotas for harvesting NWFP, based on regular monitoring. However, in practice, it is usually the forest ranger and inspector who implement this task. An enterprise for the collection and commercialization of NWFP has been created under the Agency "Moldsilva". The Agency's own NWFP consumption is harvested and collected without permits.

According to the State Tourism Agency, nature-based tourism is not yet of importance for the country – nature and natural sights are of almost no relevance. At the moment, tourism is somewhat regarded as a development option for PAs such as Orhei National Park (currently under establishment), rather than as a thread of biodiversity.

There is no State programme promoting the natural values of the country and ecotourism as such; in principle, agricultural (in particular vineyard) tourism is a priority for the country. The inclusion of ecotourism is foreseen in the national tourism strategy 2020, which is currently under development. The National Fund for Regional Development funds some tourism infrastructure linked to PAs in order to increase investment attraction and the visibility of tourism values, and to promote diversification of the regional economy.

Climate change

As in other parts of the region and the world, a trend of increasing air temperature can be observed in the Republic of Moldova. Not only an increase in summer temperature is observable; within the last two decades, seven of the 10 hottest summers in the history of instrumental observations in the Republic of Moldova, and nine droughts, have been recorded. Within the reporting period, the Republic of Moldova was subjected, in particular, to a heat wave in 2007.

Tourism

Whereas there is evidence of an increase in the variability of precipitation in transition seasons, the overall picture of precipitation change remains complex and a clear trend is not yet apparent. Little targeted research is available on the direct impact of climate change on ecosystems and biodiversity in the Republic of Moldova, except the 2009 Regional Climate and Environmental Change: the Republic of Moldova Case Study.

Table 9.3: Non-wood forest products harvested by the Agency "Moldsilva" and subordinated enterprises

Category	Unit of measurement	Year				
		2006	2007	2008	2009	2010
Fruit and berries	tons	302.8	533.3	696.8	331.5	360.8
Medicinal herbs	tons	118.1	148.3	149.5	66.5	45.2
Honey	tons	5.6	5.9	4.2	5.8	5.2
Snails	tons	60.6	53.6	57.8	44.1	23.7
Christmas trees	thousand pieces	18.3	16.6	6.6	4.9	13.9
Fruit tree saplings	thousand pieces	16.7	11.3	..	1.6	..
Saplings	thousand pieces	24.3	0.4	0.1	0.4	..
Rose saplings	thousand pieces	0.9	3.0	0.2	..	..

Source: Botnari, F., D. Galupa, I. Platon et al. State of the Forestry of the Republic of Moldova 2006–2010. Agency "Moldsilva". 2011.

The consequences of climate change for biodiversity and ecosystems would be well recognizable, given that the country's geographical location is at the border of three geo-climatic regions and many species occur at its ecological range boundary. Generalized scenarios forecast a shift from semi-arid to arid land, and from meadow steppe to dry steppe formations. The currently existing beech (*Fagus sylvatica*) forests are expected to turn into oak- and hornbeam-dominated stands.

As is seen from General Circulation Model scenarios, the available surface water resources for the Dniester and Prut river basins will already have fallen by about 16 to 20 per cent by the 2020s, and by up to 39 to 58 per cent by the end of the 21st century. In combination with the instability of annual flow, the amplitude and intensity of droughts as well as (spring and flash) floods will increase incidents the country experienced in 2007 and 2010. Here, the consequences of floodplain and riparian forest degradation such as reduced water retention potential lead to severe hardship in terms of livelihood, the economy and ecology. Increasing aridity (in the summer months) leads to increasing soil salinization which, in turn, leads to the decline of wetland species such as sedges in favour of halophytes and rudal species.

The draft national climate change adaptation strategy directly reflects forest as an ecosystem, afforestation and reforestation. It proposes adaptations in the agricultural sector (e.g. no tillage, optimization of crop rotation and reduction of water runoff), which are also beneficial to agro-biodiversity. Yet details on, for example, conserving agricultural species' genetic diversity, are lacking, as are concrete actions to be taken with regard to watershed management.

In addition, integrated policies addressing climate change mitigation efforts or agricultural land use concepts in combination with nature conservation are still not at an optimum level. Overall, the value of intact or restored ecosystems, and the potential of protected areas and biological diversity are not reflected. An integrated concept of climate change adaptation linked with ecosystem restoration and species and habitat conservation is not applied in the Republic of Moldova. Ecosystem-based adaptation as a methodological approach is not yet facilitated by the country's adaptation strategy – but is highly advisable. Responses to pressure, such as the climate change adaptation strategy, form a good basis for such an approach, yet need to be supported by more background science to improve the output of the proposed actions.

Assessment

The pressure on all major natural habitats of the country – forest, wetlands, steppe – remains very high. Intensive agricultural development and excessive hunting still contribute to the degradation of natural ecosystems. Threats to species and habitats remain; an increased number of species will be included in the update of the Red List. Faced with financial hardships, a systematic update of species data is still insufficient. But what to protect if sound assessment itself is still challenging? Fragmentary, project-driven updates on species and habitats still drive ambitions and obligations that the country has set nationally and internationally.

The increase of forest cover largely relates to the plantations of black locust. Acacia plantations are certainly valuable to stabilize soils and provide multiple benefits such as fuel wood and bee fodder; however, that monocultural dominance is misleading within the reports of improvement in afforestation – the ecological value remains limited. With a rather uniform age structure of the forest, the ecological importance of old grown forest should be more

reflected in forest management – just as riparian forest restoration needs to be given special attention. The concept of zero use, small-scale, pristine forest segments acting as nucleoli for forest development is not yet applied in the Republic of Moldova.

9.4 Legal, policy and institutional framework

Legal framework

The major improvements in the legal framework are:

- Adoption of the 2005 Law No. 325-XVI on the Red Data Book of the Republic of Moldova:
- regulating protection, use and restoration of species of plants and animals which are rare or on the verge of extinction, and which are included in the Red Data Book of 2005;
- Adoption of the 2007 Law on the National Environmental Network, for the first time building the legal basis to establish the network by linking existing and potential PAs as of 2007;
- Amendment of the Law No. 439-XIII on Fauna with changes in regard to species conservation and monitoring in 2008.

The 2007 Law on the National Environmental Network, subsequently supported by the 2011 GD on Approval of the National Programme on the Environmental Network for 2011–2018, establishes a good foundation and is seen as a future contribution not only to the Emerald Network but also, in the context of the Association Agreement with the EU, to the fulfilment of the Birds and Habitat Directives.

Yet, some laws – such as the Law on Landscapes, giving substance to the Florence Convention on Landscapes signed by the Republic of Moldova, the amendment of the Law on Nature Protection, the thorough update of the Forest Code, or the GD to establish Orhei National Park – are still pending after several years, or still under discussion.
Effective nature conservation and efficient PA management would be ensured by the adoption of the draft law on protected areas. The draft law addresses the following shortcomings in current documents regarding, in particular:

- Management of PAs other than scientific reserves;
- The difference between national PA categories and IUCN categories.

In 2012, the Government approved certain regulations for the implementation of the 2010 Law No. 228 on Protection of Plants and Phytosanitary Quarantine. This provided a list of harmful organisms, plants, plant products and other objects and set conditions for their import, testing, research, breeding and distribution.

Strategies and programmes

In the National Programme on the Environmental Network for 2011–2018, 62 sites, defined as core areas anchoring the network, have been defined, covering 72,309 ha. The NEN has received repeated attention in the last decade, yet it has not succeeded. One of the reasons for this is that the NEN is based on existing PAs and afforestation of degraded sites rather than on effective increase in the area for conservation.

In national strategic documents, e.g. that relating to the Millennium Development Goals or the 2011 Government Action Programme, European Integration: Freedom, Democracy, Welfare 2011–2014, aspects such as increasing the forest share and PAs, and halting ecosystem degradation, are generally addressed.

Within the NDS for the period 2012–2020, the Government's strategic vision over the medium and long term is reconciliation between the need for accelerated economic development and environmental protection in conformity with European standards. However, clear reference to sustainable development (SD), nature conservation or adaptation to climate change is not made.

Important international projects

Certainly a big gain for PA planning and management is the ongoing UNDP/GEF project Improving Coverage and Management Effectiveness of the Protected Area System in Moldova, as: (i) major shortcomings of current PA management are assessed, (ii) options for governance, management and financing of the PAs are discussed; and (iii) 27 detailed recommendations are made regarding, for example, optimizing the PA classification, the re-organization of management responsibilities, and capacity-building and stakeholder participation at local level. Furthermore, within the framework of the project, the Orhei National Park is supposed to be established with all necessary implementing aspects covered.

Under the 2009–2012 ENPI Forest Law Enforcement and Governance Programme (FLEG) project

Improving Forest Legislation in the Republic of Moldova, significant steps were taken to update the forestry law regime, assess the state of forestry and critically review the status of illegal logging in the country.

The Soil Conservation Project (2006–2015) of the World Bank aims at the restoration of about 20,000 ha of degraded sites. Linked to this project, the Moldova Community Forestry Development Project (of the Carbon Fund and the World Bank) for 2009–2018 is another pioneer in terms of restoring degraded land by reforestation.

Institutional arrangements

The central authority for biodiversity-related issues is the Ministry of Environment. The central authority for forestry and for PAs is the Agency "Moldsilva".

As the Ministry of Environment lacks capacity effectively to fulfil all of its functions with respect to PAs, the Agency "Moldsilva" is the de facto site management authority for PAs. There is a debate on the appropriateness of this arrangement, particularly as there is a lack of clear institutional arrangement between the Ministry and the Agency, which does not allow adequate oversight and control of management, in particular of PAs. However, in practical terms, the Agency "Moldsilva" is currently the only institution with the administrative and technical infrastructure and funds to assure protection and management of PAs.

Although a National Biosafety Testing Centre was formally established by joint decision of the Ministry of Environment and the Ministry of Education 10 years ago, there is still neither a laboratory nor equipment for testing GMOs. A further shortcoming is the lack of a legal basis for imposing fines in the event of unauthorized GMO use.

Of 37 European countries, the Republic of Moldova is one of six where, according to *The State of Europe's Forests 2011*, administering the development and implementation of forest policy is not part of the Ministry of Environment's responsibilities. These tasks, together with the management of the NFL, are conducted by the Agency "Moldsilva". However, since the adoption of the Law on Plants in 2007, the Ministry of Environment, via the SEI, has the power to enforce obligations of environmental legislation in forests.

A range of national bodies on biodiversity issues has been set up with the involvement of various stakeholders, including the Academy of Sciences. These are:

- National Committee of the Red Book – to select flora and fauna species to be included in the Red Book;
- National Commission for Biosafety – to fulfil tasks such as assisting implementation of the Cartagena Protocol on Biosafety to the Convention on Biological Diversity;
- General Scientific Council for Protected Areas – to establish scientific research programmes in PAs, supervise and approve the management documents of scientific reserves, and administer relevant governmental research funds;
- National Ramsar Committee – to oversee the implementation of the Ramsar Convention;
- Evaluation commissions for wood and timber harvesting – to set quotas for the amount to be harvested based on available information from the Agency " Moldsilva" and in consultation with the Academy of Sciences;
- Working Group to implement the Convention on the Conservation of Migratory Species of Wild Animals;
- Scientific Council on Ichthyology – to set quotas on fish harvesting.

Communication and public awareness-raising

In general, over recent years, with an increase in internationally funded conservation projects, the amount and range of publications increased significantly; these are usually available online. Good examples of science and monitoring-based publications on reserves are "Zapovednik Jagorlik", published in 2006 by the NGO Eco-Tiras, and one on the Lower Prut Scientific Reserve, published by the Academy of Sciences with financial support from the Agency "Moldsilva" and the National Environmental Fund in 2012. In 2013, a publication describing all PAs in the south-west of the country was published by the Academy of Sciences as the first in an intended series.

Whereas the scientific reserves have their own departments for education and communication, information on other PAs is harder to obtain. Regular national coverage of biodiversity and nature aspects are communicated via radio shows such as "Ecomonitor", "Ecojurnal" and "Ecoterra", or on TV in "Natura în obiectiv". Summer schools and thematic excursions, voluntary work projects (e.g. species reconstruction work in PAs) indicate an

active and lively NGO-driven conservation scene in the country.

9.5 Conclusions and recommendations

Since 2007, the legal framework for nature conservation has been improved. Innovative international projects supported the development of regulations, allowed assessment of biodiversity and nature conservation management, and contributed directly to PA management and reforestation. However, ambitious goals are not fully supported by the regulatory framework and implementation remains behind targets. A lack of resources and capacity, together with weak intersectoral cooperation and institutional settings, certainly play a role in this.

Three main fields of recommendations can be outlined, all of particular importance if the Republic of Moldova intends to associate with EU standards and requirements: i) regular monitoring and research as an improvement on basic data; ii) optimizing and streamlining PA management and strengthening on-the-ground conservation actions; and iii) institutional reforms to improve policymaking for nature conservation.

All further conservation planning and design requires the updating and verification of available data. Reporting to the European Forest Survey in 2011, the Republic of Moldova could only provide less than 40 per cent of the required data. As new forest inventories are not yet implemented and updated nationwide (only scientific reserves are covered), new approaches such as ecosystem-based adaptation are, consequently, scarcely included in forestry management. A sound inventory should, further, form the basis for the development of the Republic of Moldova's forest to a potential natural stage.

Recommendation 9.1:
The Agency "Moldsilva" should finalize without delay the updating of the national forest inventory as a basis for any forestry management decision to be taken.

The Republic of Moldova has set itself ambitious and worthwhile targets in regard to PA establishment and management; once these are implemented, nature conservation will significantly improve. A real net increase in the size of PAs on the ground, to achieve the ecological integrity of conservation, is the ambition.

Yet the construction of a robust and financially sustainable system, including skilled personnel as well as infrastructure sufficient for the necessary management and visitor services, is urgently needed. In this regard, institutional reform is seen as advisable, including institutional sharing of resources and budgetary reforms between the Ministry of Environment and parallel institutions as well as subordinated entities such as the Agency "Moldsilva".

The need for the establishment of competent authority on PA management, placed either within the Department of Natural Resources and Biodiversity of the Ministry of Environment or within the Agency "Moldsilva", is advised, to adequately reflect areas of national importance (national parks and biosphere reserves, the latter of which do not yet exist) within the institutional setting but also to appropriately respond to international requirements. Not the most effective for in situ conservation, the existing PAs (e.g. steppe and wetland habitats) still await upgrading to achieve conservation targets.

Recommendation 9.2:
The Ministry of Environment, in cooperation with the Agency "Moldsilva", should accelerate the preparation of the new law on protected areas in order to, in particular:

- *(a) Harmonize national protected area categories with those of the International Union for the Conservation of Nature (IUCN);*
- *(b) Harmonize the management structure of protected areas in line with national conservation priorities and international standards;*
- *(c) Prioritize actions in regard to the extension of the protected areas network.*

Due to the fragmentation of habitats and intensive agricultural development of the Republic of Moldova, any spatial extension of conservation efforts on the ground needs to align with ongoing and future agricultural schemes and processes. Agro-environmental schemes have already been proposed for a long time, yet implementation still remains insufficient. With regard to the NEN, integrated spatial as well as landscape planning should become the core planning instrument, offering the chance for intersectoral cooperation and target-setting. In particular, wetlands, including riparian forest, offer good and much-needed chances for integrated restoration and utilization plans. Continuous degradation of hedges between agricultural fields hampers the migration of specific animal species.

Recommendation 9.3:
The Ministry of Agriculture and Food Industry, in consultation with the Ministry of Environment, should mainstream species conservation into agricultural practices and develop a habitat restoration programme, which would cover, inter alia, restoration of hedges.

Whereas many actions to foster biodiversity conservation have been initiated by governmental and non-governmental institutions, the upcoming ecosystem change and response due to climate change is not yet well reflected. Linking a landscape approach to biodiversity protection, reflecting different climate change scenarios, and ecosystem-based adaptation strategies into national policies, is the next step for the development of national environmental policies. Particularly for wetlands, development of ecosystem-based adaptation concepts provides a cost-effective, integrated and consolidated approach for ecosystem services such as water retention, purification and filtration, and species conservation, linking fragmented migrating corridors, as well as sustainable land use.

The Man and Biosphere concept according to the Sevillia Strategy provides the appropriate framework in this regard, as does the Florence Convention on Landscape. For an intensively agriculturally used country such as the Republic of Moldova, the integration of ecosystem values into regional development planning will succeed in achieving improved biodiversity conservation.

Recommendation 9.4:
The Ministry of Environment should:

(a) Include ecosystem-based adaptation in its draft national climate change adaptation strategy;
(b) Finalize the preparation of the draft law on landscapes, based on the European Landscape Convention.

Chapter 10

AGRICULTURE AND ENVIRONMENT

10.1 Conditions and activities in agriculture

Agricultural activities

Structure of agricultural lands

The land use structure in the Republic of Moldova has not changed significantly since 2005. The territory of agricultural lands decreased slightly from 2,521.6 thousand ha in 2005 to 2,498.0 thousand ha in 2012 (table 10.1). The land cover under pasture decreased by 20.5 thousand ha (5.5 per cent).

At the same time, the land cover under forest increased by 23.2 thousand ha (5.3 per cent) and fallow lands increased by 26.4 thousand ha (some 261 per cent). This illustrates the process of many owners abandoning land. On some part of the abandoned land, natural reforestation takes place. The land used under different crops has fluctuated since 2005 with no visible and stable tendency observed for any of them. However, overall sown areas decreased from 1,540.3 thousand ha in 2005 to 1,447.2 thousand ha in 2010 (table 10.2).

Organizational types of agricultural production units, including ownership

There are three main organizational types of agricultural production units in the Republic of Moldova, namely agricultural enterprises, farms and households. According to statistical classification, agricultural enterprises includes all enterprises, organizations, associations producing agricultural products and enterprises serving agriculture, and also enterprises with agriculture as the secondary activity. Data on households include data on individual auxiliary households, horticultural associations and privatized horticultural plots. Data on farms cover agricultural activity of persons who were given land parcels in the form of shares of equivalent land.

As of 1 January 2012, 73.8 per cent of agricultural lands were in private ownership (table 10.3). This high share also applies to arable lands (85.4 per cent), orchards (83.8 per cent), vineyards (94.4 per cent) and fallow lands (86.3 per cent). A much lower share of hayfields is in private ownership (25 per cent). And almost all pastures are in public ownership (98.9 per cent). As the process of privatization of agricultural lands took place before the period under review, the above-mentioned shares have remained stable since 2005.

Table 10.1: Land use, as of 1 January 2012

	thousand ha	per cent
Land – total, of which:	3,384.6	100.0
Agricultural lands	2,498.0	73.8
arable lands	1,810.5	53.5
perennial plantations, of which:	298.7	8.8
orchards	134.5	4.0
vineyards	147.3	4.3
pastures	350.3	10.3
hayfields	2.0	0.1
fallow lands	36.5	1.1
Forests and lands covered with forestry vegetation	462.7	13.7
Rivers, lakes, reservoirs and bogs	99.5	2.9
Other lands	324.4	9.6
Note:		
Irrigated lands, of which:	228.3	6.7
arable land	213.3	6.3
perennial plantations	13.3	0.4

Source: Statistical Yearbook of the Republic of Moldova, 2012.

Crops and vegetables production and yields

In the period 2005–2010, the gross harvest of some agricultural crops decreased, e.g. winter wheat, leguminous crops, potatoes and vegetables. At the same time, the gross harvest of some other agricultural crops increased, e.g. sunflower, soy, melons and gourds (table 10.4). The yield per hectare is not even year by year (table 10.5). The sharp decline in 2007 was caused by the most severe drought in the Republic of Moldova in living memory, with 80 per cent of the country's territory impacted upon by the event, including widespread crop failures and food shortages. According to the 2008 joint report issued by the United Nations Food and Agriculture Organization (FAO) and the World Food Programme, reduced yields not only affected overall production, but drastically reduced returns on leased land and on labour, hitting small farmers, who usually receive in-kind payments of wheat, corn and oil, particularly hard.

Table 10.2: Sown areas with agricultural crops, thousand hectares

	2005	2006	2007	2008	2009	2010	2011
Sown areas – total	1,540.3	1,483.4	1,499.2	1,500.3	1,464.1	1,460.3	1,447.2
Cereals and leguminous crops, of which:	1,034.7	917.6	955.4	1,005.8	951.6	919.6	894.0
winter wheat	401.2	290.2	307.1	408.6	348.1	321.3	301.8
winter barley	56.4	39.4	54.4	73.6	82.0	75.3	62.6
spring barley	62.4	69.3	73.2	56.6	73.7	57.3	40.9
grain maize	455.9	459.3	466.2	428.0	401.8	415.9	455.5
leguminous crops	41.5	41.5	39.3	27.8	32.6	34.9	27.9
Industrial crops, of which	358.0	400.7	368.2	342.1	365.4	388.3	412.4
sugar beet	34.2	42.4	34.3	24.7	23.4	26.4	25.4
sunflower	275.7	287.4	233.6	228.0	226.6	252.4	277.0
soy	36.2	55.7	50.5	30.5	48.8	59.0	58.9
tobacco	4.7	3.5	3.1	2.7	2.5	4.4	3.8
Potatoes, vegetables and melons and gourds, of which	79.8	87.6	81.5	81.2	76.4	77.1	72.6
potatoes	35.9	34.4	35.4	31.2	28.2	27.6	29.2
field vegetables	36.7	42.4	37.7	39.8	35.2	37.9	34.4
Forage crops	67.8	77.5	94.1	71.2	70.7	75.3	68.2

Source: Statistical Yearbook of the Republic of Moldova, 2012.

Table 10.3: Agricultural lands by forms of ownership, as of 1 January 2012

		Public land		Private land	
	By all forms of ownership	thousand ha	% of total land category	thousand ha	% of total land category
Agricultural lands – total, of which	2,498.0	654.9	26.22	1,843.1	73.78
arable land	1,810.5	264.2	14.6	1,546.3	85.4
perennial plantations, of which:	298.7	37.6	12.6	261.1	87.4
orchards	134.5	21.8	16.2	112.7	83.8
vineyards	147.3	8.2	5.6	139.1	94.4
pastures	350.3	346.6	98.9	3.7	1.1
hayfields	2.0	1.5	75.0	0.5	25.0
fallow lands	36.5	5.0	13.7	31.5	86.3

Source: Statistical Yearbook of the Republic of Moldova, 2012; author's own calculations.

Table 10.4: Gross harvest of agricultural crops, thousand tons

	2005	2006	2007	2008	2009	2010	2011
Cereals and leguminous crops – total, of which:	2,837.9	2,290.2	901.9	3,169.5	2,176.5	2,421.3	2,498.2
winter wheat	1,047.1	677.9	402.1	1,277.4	729.0	729.6	794.8
barley (winter and spring)	212.0	200.1	115.2	353.1	261.4	208.4	194.0
grain maize	1,492.0	1,322.2	362.7	1,478.6	1,141.1	1,419.8	1,468.3
leguminous crops	64.5	67.5	14.1	37.1	27.8	35.8	31.8
Sunflower	331.1	379.9	155.5	371.9	284.2	382.3	427.4
Soy	65.6	79.8	39.8	58.1	49.2	110.6	78.7
Sugar beet (industrial)	991.2	1,177.3	612.3	960.7	337.4	837.6	588.6
Tobacco	6.7	4.8	3.6	3.9	4.4	7.6	5.4
Potatoes	378.2	376.9	199.4	271.0	260.9	279.6	350.8
Vegetables	389.3	475.2	221.8	376.3	307.9	341.2	361.5
Melons and gourds	48.3	92.0	41.0	69.9	101.9	103.4	84.1

Source: Statistical Yearbook of the Republic of Moldova, 2012.

Table 10.5: Yield of agricultural crops, quintals per hectare

	2005	2006	2007	2008	2009	2010	2011
Cereals and leguminous crops – average	27.6	25.2	10.1	31.7	23.2	26.7	28.1
Winter wheat	26.1	23.4	13.3	31.3	21.0	22.9	26.0
Barley (winter and spring)	18.0	18.5	9.5	27.2	17.1	16.3	18.8
Grain maize	33.0	29.1	8.6	34.9	28.9	34.5	32.5
Leguminous crops	15.7	16.3	4.0	13.6	8.8	10.7	11.6
Sunflower	12.1	13.3	6.9	16.5	12.7	15.3	15.6
Soy	18.5	14.8	10.2	19.8	11.2	19.0	13.7
Sugar beet (industrial)	297.8	283.2	192.8	390.9	170.9	319.6	237.3
Tobacco	14.5	14.0	12.4	14.6	17.6	17.7	14.2
Potatoes	105.7	109.6	56.8	86.9	92.7	102.1	119.0
Vegetables	105.4	112.6	59.3	94.4	85.8	89.2	101.4
Melons and gourds	92.1	106.2	59.5	80.9	88.1	103.5	108.0

Source: Statistical Yearbook of the Republic of Moldova, 2012.

Photo 10.1: Winery "Milesti Mici"

Household production from home gardens, a mainstay of food supply for most rural families, was also down sharply. In monetary terms, the losses for the agricultural sector in the Republic of Moldova were estimated at close to US$1 billion.

The greatest losses were experienced by fruit and vegetable growers (US$550 million), livestock producers (US$305 million) and cereal growers (US$132 million).

Animal husbandry and production

The number of livestock in the country has not changed significantly since 2005, with one visible exception, cattle (table 10.6). The number of cattle decreased from 331,000 in 2005 to 204,000 in 2012 (-38 per cent), of which cows decreased from 231,000 in 2005 to 144,000 in 2012 (-38 per cent). The number of pigs has been fluctuating over the years. First it increased from 398,000 in 2005 to 532,000 in 2007.

The extreme drought in 2007 resulted in this number dropping to 299,000 in 2008 and then to 284,000 in 2009. Subsequently, the number of pigs has almost recovered to a pre-drought level and reached 439,000 in 2012. The 2007 drought has had less impact on the number of cattle, sheep, goats and horses, although all slightly decreased in number in 2008 compared with 2007. Lack of pasture and fodder, and the need to purchase increasingly expensive food, have forced the majority of households to sell a substantial share of their livestock. Animal husbandry in the Republic of Moldova is still very extensive with most of the livestock concentrated in private households. Cattle farms are almost non-existent in the country. There are no farms specialized in the production of animal products. In the period 2005–2011, in all categories of farms, an average 135,000 tons in live weight of meat of species of animals and birds, 594 thousand tons of milk and 694 thousand eggs were produced (table 10.7). The average annual milk yield per cow was 3,889 kg. An analysis of the sector for the production and processing of milk in the Republic of Moldova reveals that cow herds are in permanent decline; 97 per cent of cow herds are kept by people in rural households (peasant homes); milk produced in private households is a seasonal product, making it difficult to ensure the capacity to process raw material during autumn and winter; the capacities of processing companies are used 22.6 per cent, on average.

Viticulture

The total area of vineyards is 149.6 thousand ha. Around 32 thousand ha were planted between 2002 and 2011. Of all vineyards, 94.5 per cent are in private ownership. The annual average vintage during the period 2005–2010 was 569 thousand tons. The gross harvest of grapes largely fluctuates from year to year and was lowest in 2006 (466.1 thousand tons) and highest in 2009 (685.1 thousand tons) (table 10.8).

Organic agriculture

The Moldovan authorities and SGS (Société Générale de Surveillance S.A.) are developing a System for Certification of Organic Agricultural Food Products. SGS Moldova, in line with the SGS Organic Production Standard (OPS), has certified grapes and wine producers working 2,830 ha of industrial vineyards or 2.7 per cent of the total plantation surface. Apples and beekeeping products are also produced in the country under organic farm management principles.

Table 10.6: Livestock, thousand heads, as of 1 January

	2005	2006	2007	2008	2009	2010	2011	2012
All categories of producers								
cattle	331	311	299	232	218	222	216	204
of which: cows	231	217	207	169	160	161	154	144
pigs	398	461	532	299	284	377	478	439
sheep and goats	942	938	947	853	866	915	905	832
horses	73	69	67	58	56	54	52	50
Agricultural enterprises								
cattle	20	20	19	15	13	12	11	11
of which: cows	8	8	7	6	5	5	4	4
pigs	33	46	66	61	65	92	137	119
sheep and goats	37	36	35	30	25	22	18	18
horses	3	3	2	2	2	1	1	1
Farms								
cattle	1	0	0	1	0	1	1	1
of which: cows	0	0	0	0	0	1	0	0
pigs	1	0	1	1	1	2	2	2
sheep and goats	1	2	1	1	1	2	2	2
horses	0	0	0	0	0	0	0	0
Households								
cattle	311	291	280	217	205	209	204	192
of which: cows	223	209	200	163	155	156	150	140
pigs	364	415	465	237	218	283	339	318
sheep and goats	904	900	911	822	840	891	885	812
horses	70	66	65	56	54	53	51	49

Source: Statistical Yearbook of the Republic of Moldova, 2012.

Table 10.7: Production of main animal products

	2005	2006	2007	2008	2009	2010	2011
Cattle and poultry for slaughter (in live weight), thousand tons	121	134	149	108	124	150	159
Milk, thousand tons	659	627	604	543	575	591	560
Eggs, million pieces	762	765	704	563	640	718	705
Wool (in natural weight), tons	2,079	2,170	2,146	2,021	1,996	2,067	2,043

Source: Statistical Yearbook of the Republic of Moldova, 2012.

Table 10.8: Gross harvest and yield per hectare of grapes

	2005	2006	2007	2008	2009	2010	2011
Gross harvest, thousand tons	518.5	466.1	598.0	635.5	685.1	481.6	594.8
Yield per hectare, quintals	36.2	31.9	41.0	44.4	48.4	34.9	45.5

Source: Statistical Yearbook of the Republic of Moldova, 2012.

The project Development of Ecological Agriculture is being implemented in the country in the period 2011–2013. It is focusing on the support of organic agriculture through building the capacity of farmers, their associations and service providers. Farmers' access to investments is to be increased and demand for organic products in the country stimulated. Within the project, the awareness of public and State officials is being raised about the benefits of organic agriculture. This will lead to the formulation of a national action plan on the development of organic agriculture.

In the Republic of Moldova, 32 thousand ha (1.7 per cent of the total agricultural lands) are either certified or under conversion for organic agriculture. There are 253 farms practicing organic agriculture. Agricultural subsidies allocated for organic products form a tiny share of the total amount of agricultural subsidies in the country. Some 2 million lei were allocated as subsidies for organic products in 2007, 4 million lei in 2008, 2 million lei in 2009 and 2.6 million lei in 2010. In 2011, some 5.3 million lei were approved, which amounts to 1.3 per cent of the total fund for agricultural subsidies. In fact, only 786,000 lei have been effectively disbursed. The average sum per beneficiary is some 60,000 lei.

Employment in the agricultural sector

Although the number of agricultural enterprises remained stable in the period 2005–2011, the average number of employees declined by more than 55 per cent from 115 thousand in 2005 to 52.3 thousand in 2011 (table 10.9). In reality, however, employment in the agricultural sector is much higher as agricultural enterprises produce only one third of the total volume of agricultural production.

Use of fertilizers and pesticides, and manure management

Data on the application of mineral and organic fertilizers are shown in tables 10.10 and 10.11. The use of mineral fertilizers increased from 16.5 thousand tons in 2005 to 23.6 thousand tons in 2011, while the use of organic fertilizers dropped sixfold between 2005 and 2006 and then recovered slightly to 29.2 thousand tons in 2010. The average amount applied per hectare of sown area is negligible: 40 kg in 2011. Nitrogen fertilizers are prevalent. Their consumption increased from 16.56 kg/ha in 2005 to 22.09 kg/ha in 2011. The use of phosphatic and potash fertilizers has also increased: phosphatic from 1.44 kg/ha in 2005 to 3.38 kg/ha in 2011, and potash from 0.44 kg/ha in 2005 to 1.7 kg/ha in 2011.

Table 10.9: Employment in agricultural enterprises

	2005	2006	2007	2008	2009	2010	2011
Number of enterprises (end of year)	1,524	1,522	1,528	1,573	1,620	1,580	1,536
Average number of employees, thousand	115.0	95.7	82.1	74.2	66.9	59.8	52.3

Source: Statistical Yearbook of the Republic of Moldova, 2012.

Table 10.10: Mineral and organic fertilizers used in agricultural enterprises

	2005	2006	2007	2008	2009	2010	2011
Mineral fertilizers (active substance) – total, thousand tons	16.5	15.4	20.1	22.7	17.0	20.1	23.6
of which:							
nitrogen	14.8	12.8	17.1	19.9	14.6	16.4	19.2
phosphatic	1.3	1.9	2.0	1.7	1.6	2.4	2.9
potash	0.4	0.7	1.0	1.1	0.8	1.3	1.5
in average per 1 sown hectare, kg	21.0	20.0	25.0	28.0	21.0	24.0	29.0
organic fertilizers, thousand tons	38.7	6.3	7.9	8.0	6.9	15.1	29.2
in average per 1 sown hectare, kg	40.0	10.0	10.0	10.0	10.0	20.0	40.0

Source: Statistical Yearbook of the Republic of Moldova, 2012.

Table 10.11: Mineral and organic fertilizers used

	2005	2006	2007	2008	2009	2010	2011
Nitrogen mineral fertilizers (kg/ha)	16.56	15.21	19.61	22.18	16.63	18.63	22.09
Phosphatic mineral fertilizers (kg/ha)	1.44	2.22	2.27	1.89	1.87	2.71	3.38
Potash mineral fertilizers (kg/ha)	0.44	0.85	1.09	1.17	0.91	1.50	1.70
Total mineral fertilizers (kg/ha)	18.44	18.28	22.97	25.24	19.41	22.84	27.17
Total area where mineral fertilizers were applied (thousand ha)	286.70	255.90	350.10	402.60	301.50	324.00	412.70
Total area where mineral fertilizers were applied as a percentage of total agricultural lands	32.12	30.37	40.04	44.82	34.40	36.90	47.46
Organic fertilizers (kg/ha)	43.00	7.00	9.00	9.00	8.00	17.00	3.00
Total area where organic fertilizers were applied (thousand ha)	2.70	1.40	2.50	1.60	0.50	2.30	3.30
Total area where organic fertilizers were applied as a percentage of total agricultural lands	0.30	0.17	0.29	0.18	0.06	0.27	0.38

Source: Ministry of Environment, 2013.

The total area where mineral fertilizers were applied, as a percentage of total agricultural lands, has increased from 32.12 per cent in 2005 to 47.46 per cent in 2011. The total area where organic fertilizers were applied, as a percentage of total agricultural lands, is negligible: 0.3 per cent in 2005 and 0.38 per cent in 2011.

The total area where phytosanitary products were applied dropped from 619.9 thousand ha in 2011 to 566.3 thousand ha in 2012 (table 10.12). Fungicides were applied on a larger territory than were insecticides. The area where herbicides were applied increased from 632.4 thousand ha in 2011 to 724.0 thousand ha in 2012. This is linked to an increased usage of herbicides after the coming up of crops.

Use of genetically modified organisms

There are still limited factual data concerning the situation on GMOs in the Republic of Moldova. On the one hand, until now there have been no notifications to the National Biosafety Committee for GMO import to the Republic of Moldova. No one GM plant variety is registered and permitted for growing in the country. On the other hand, the testing of some soy products on the Moldovan market by a United Kingdom laboratory has demonstrated that seven of nine imported products contain GM soy components and only two are free of them.

Table 10.12: Use of phytosanitary products, thousand hectares

	2011	2012
Total area where phytosanitary products were applied (excluding herbicides), of which:	619.9	566.3
Insecticides	329.1	311.4
Fungicides	482.6	452.3
Biological means	1.3	1.8
Herbicides	632.4	724.0
before coming-up	224.8	233.2
after coming-up	407.7	490.8

Source: General Inspectorate for Phytosanitary Surveillance and Seeds Control, 2013.

It is also clear that a lot of seeds of agricultural plants could be smuggled through relatively porous national borders and then used for growing on an industrial scale. Because GMOs are already in use in neighbouring countries, transboundary pollination can be another way of contamination of plant varieties in the Republic of Moldova.

Crop rotation

There are no countrywide data on crop rotation and there is no evidence that this agricultural practice is widely applied. However, some studies have been carried out and many positive results received.

For example, the results obtained in a long-term field experiment by the Research Center "Selectia" (since 1991), with two different crop rotations (with and without mixture of perennial leguminous crops and grasses) and four different systems of fertilization (without fertilization; manure; manure + phosphorous + kalium; manure + natrium + phosphorous + kalium), were examined on arable typical cernozem in the Balti steppe of the Republic of Moldova. Experimental data showed crop rotation having a high role in yield formation.

Another long-term study on a cambic chernozem from the Moldavian Plain with a slope of 14 per cent reconfirmed the influence of different crop rotations and fertilization on soil erosion and fertility. For example, placing winter wheat and maize in rotation peas-wheat-maize-sunflower + reserve field cultivated with perennial grasses and legumes, has resulted in yield increases of 26 per cent (736 kg/ha) and 31 per cent (1,364 kg/ha) respectively, against continuous cropping. The mean annual losses of nitrogen, phosphorus and potassium, combined with water runoff and eroded soil on 14 per cent slope fields, were of 19.9 kg/ha in maize continuous cropping, 11.9 kg/ha in wheat-maize rotation and 8.1 kg/ha in the rotation peas-wheat-maize-sunflower + two reserve fields cultivated with perennial grasses and legumes.

Agricultural subsidies

Agricultural production and food processing industries are very important for the Republic of Moldova's economy, accounting for some 30 per cent of GDP and 70 per cent of merchandise exports. A strong agricultural sector is of major importance for making sustained progress in rural poverty alleviation, given the limited labour absorption capacity of the non-agricultural sectors. Against this background, the Government has taken a range of measures designed to promote agricultural activity, notably the development of high value organic agriculture (box 10.1), which is, in addition to efforts made towards reducing pollution from agriculture, also a step towards greening the economy.

As is the case in many other countries, the agricultural sector in the Republic of Moldova has been supported by State subsidies. The main public bodies in charge of financial support of the agricultural sector are the Ministry of Agriculture and Food and the Agency for Payments and Intervention in Agriculture (AIPA), which is subordinated to the Ministry. AIPA, which was established in 2010, is responsible for the management of State financial resources designed to support agricultural activities, including the distribution, monitoring and evaluation of subsidy schemes.

Since 2010, the annual subsidy budget for agriculture amounted to 400 million lei, corresponding to some 0.5 per cent of GDP. The major general aim has been to strengthen the overall competitiveness of the agricultural sector, in order to provide the rural population with employment and rising real incomes. Support of the agricultural sector has taken various forms, such as investment incentives; support for land conversion for the development of organic farming; incentives for the purchase of machinery and equipment, including irrigation equipment for the expansion of irrigated areas; and a subsidy to partly compensate farmers for the costs of electricity used for operating the irrigation system. State support for the procurement of mineral fertilizers and pesticides by farmers has been excluded from the list of subsidized activities as of 2012. In 2011, such procurement was still subsidized by an amount corresponding to 10 per cent of total cost (excluding VAT); in 2010, this share was 15 per cent.

10.2 Pressures from agriculture

Air

There are no reliable data on air emissions from the agricultural sector in the Republic of Moldova. In its 2012 submission to the Convention on Long-range Transboundary Air Pollution and EU National Emissions Ceilings Directive, the Republic of Moldova did not provide complete estimates for the agriculture sector. Emission estimates for NMVOC, NH_3 and particulates were only provided for a number of subsectors in agriculture for the years 1990, 2000–2006, 2008 and 2009. For some subsectors, only the years 2008 and 2009 have been reported. In addition, activity data is only available for the years 2008 and 2009 and not for all subsectors.

Box 10.1: Compact Programme

The Government of the Republic of Moldova and the Millennium Challenge Corporation, on behalf of the United States Government, have signed a Compact Agreement for a US$262 million grant to be implemented over a five-year period. The Agreement was signed on 22 January 2010 and entered into force on 1 September 2010. It aims to achieve the following results by the end of the compact in September 2015:

(a) The Transition to High Value Agriculture Project will entail an economic rate of return of approximately 12.7 per cent, and increase the incomes of approximately 32,000 households (or approximately 124,000 individuals), with an average total benefit over 20 years equal to 170 per cent of the beneficiaries' current annual income;
(b) The Road Rehabilitation Project will have an economic rate of return of approximately 19 per cent and benefit a population of approximately 78,000 households (or approximately 302,000 beneficiaries), over the next 20 years.

Source: http://moldova.usaid.gov/programs/economic-growth-en/agriculture-com-en
http://www.mcc.gov/pages/countries/evaluation/moldova-compact

Air emissions (NMVOC and NH_3) from agriculture remained stable during the period 2007–2010 and dropped significantly in 2011 (figure 10.1). There is no reasonable explanation for this drop. It could be caused by different methodologies being applied to estimate the emissions.

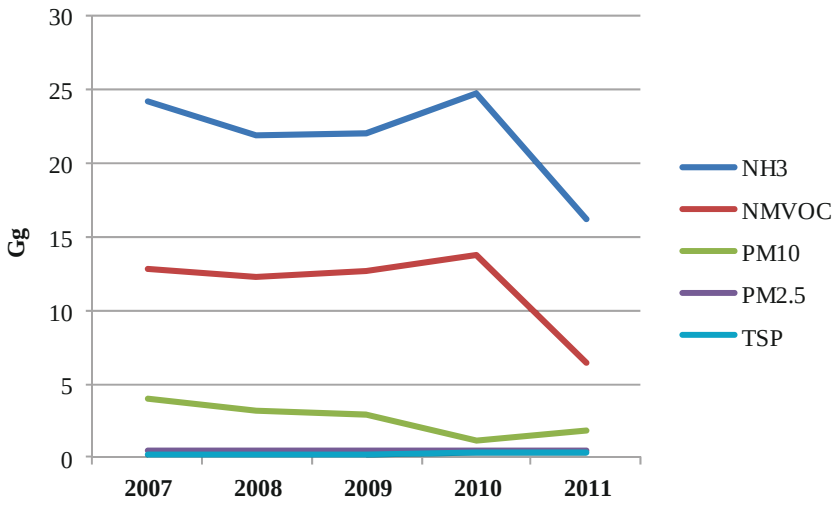
Greenhouse gas emissions

According to the Second National Greenhouse Gas Inventory as of 2005, the agricultural sector accounted for 17.9 per cent of the Republic of Moldova's GHG emissions. This emission level was second only to the energy sector, which produced the majority (65 per cent) of GHG in the country. The land use, land-use change and forestry (LULUCF) sector remained a net sink of GHG, primarily as a result of reforestation, improved forest management practices and reduced rates of illegal logging. The existence of significant mitigation potential in the agricultural sector is evidenced by the fact that, in 2005, the equivalent of 12 per cent of total emissions in the country was mitigated by this sector.

According to the Second National Communication to the UNFCCC in 2005, enteric fermentation caused emission of 79,286 Gg of CO_2 equivalent, manure management of 635.68 Gg of CO_2 equivalent, and agricultural soils of 699.25 Gg of CO_2 equivalent. At the same time, LULUCF on grasslands resulted in emission of 819.46 Gg of CO_2 equivalent and on croplands 1,684.6 Gg of CO_2 equivalent.

The country's draft 2013 national inventory report shows that total GHG emissions from agriculture dropped from 2.37 million tons of CO_2 equivalent in 2005 to 1.5151 million tons of CO_2 equivalent in 2007 and then recovered to 2.1324 million tons of CO_2 equivalent in 2010. Such a sharp decline in emissions from agriculture in 2007 was definitely caused by the above-mentioned severe drought in the Republic of Moldova.

Figure 10.1: Air emissions from agriculture, Gg



Source: www.ceip.at

Soil and land

Since 2005, the area affected by soil erosion remains at the same level with about 900,000 ha affected (chapter 9). Poor soil condition is the major environmental problem in the country. Moldovan soil is naturally very productive, but its yield potential is currently declining. Soil erosion is a serious problem, affecting about 43 per cent of agricultural land to some degree; about 6.4 per cent is considered highly eroded. Annual soil loss ranges from 5-10 t/ha on slightly eroded land to over 30 t/ha on highly eroded soils.

The area of eroded land increases by about 7,700 ha per year as a result of export-oriented agriculture and the food-processing industry. Soil degradation is estimated to cost 3.1 billion lei in economic damage each year, including erosion losses, landslide and ravine losses, and agricultural production losses. Subsistence farming households, which cannot afford to address the problem, are particularly affected by erosion and soil fertility losses. The main causes of land degradation in the Republic of Moldova are:

- Use of poor cultivation technologies;
- Land allocation taking insufficient account of the need for soil conservation;
- Insufficient crop rotation;
- Lack of financial resources;
- Limited access to information on efficient land use;
- Lack of adequate forest buffer zones.

Landslides, directly linked to soil erosion and land degradation, are increasing, causing annual economic losses estimated at 83 million lei. The areas at highest risk for landslides are between Chisinau and Balti. New owners tend to cultivate steep slopes and reduce crop rotation, thus indirectly contributing to soil erosion. Soil erosion is also caused by increased cultivation of row crops, cutting of shelterbelts along fields, unregulated road and home construction, and overgrazing of poorly managed pasture lands, which calls for urgent regulations on the use of pasture land. Organic fertilizer use has declined from 2005 to 2010 (table 10.10). Today, approximately 30 per cent of agricultural lands lack phosphorus (contained in organic fertilizers), which seriously affects soil fertility.

Water

Water use in agriculture has increased slightly from 35 million m^3 in 2005 to 39 million m^3 in 2010. Agriculture is a minor water user as it uses only 4.6 per cent of the total abstracted water in the country. There are no recent data and information on the current state of the irrigation network (chapter 7).

Water, especially in small rivers, is contaminated by agrochemical residues and manure as a result of inefficient fertilizer management practices. Water from the Dniester River is of satisfactory quality, but the Prut River is classified as “moderately polluted”. The water quality of the Prut River delta is considered “polluted” to “strongly polluted”.

In the period 2004–2009, with the support of the GEF and the World Bank, the Agricultural Pollution Control Project was implemented. The total budget of the project was US$10.95 million. The main aim of the project was to reduce the discharge of nutrients into the Danube River and Black Sea through land and water management. The project provided grants to entrepreneurs and rural enterprises for investing in sustainable agricultural practices. The rural advisory service providers were trained in crop nutrient management, conservation tillage practices, crop rotation and planting of buffer strips. The project also supported manure management and agro-forestry practices, wetland restoration, and monitoring of soil and water quality. It assisted the Ministry of Environment and the Ministry of Agriculture and Food Industry in developing a Code of Good Agricultural Practices. The results of the project included:

- Construction of three communal manure storage and handling facilities, and 450 household platforms in the pilot area of Hancesti District;
- Demonstration plots in different zones of the Republic of Moldova with strip cropping, manure handling, growing crops in crop rotations, buffer strips in vineyards and grassed waterways, etc;
- Restoration of 69 ha of shelter belts, 22 ha of shelter belts and 128 ha of forest;
- Soil quality monitoring: seven stations to measure soil runoff and nutrient loss were installed in test/demonstration fields; soil samples are regularly collected and analysed to determine the humus content, humidity, and nitrogen (NO_3), phosphorus (P_2O_5) and potassium (K_2O) levels;
- Wetland restoration, including the introduction of nutrient filtration through hydrologic enhancement practices, improved water quality monitoring and a tree planting programme covering 6.6 ha;
- About 160 household waste storage facilities were built and are regularly used for collecting and processing livestock waste.

Biodiversity

The rather stable number of sheep and goats reared by private households in steppe regions result in continuous pressure on steppe vegetation. For example, overgrazing led to the disappearance of water chestnut (*Trapa natans*) in the Orchard Turcescă protected area. Intensive agriculture has also led to fragmentation of steppe habitats (chapter 9).

10.3 Legal framework

Veterinary-sanitary activity

The 2007 Law No. 221-XVI on Veterinary and Sanitary Activities establishes general principles for the organization and activity of veterinary-sanitary services, veterinary-sanitary requirements regarding animal health and animal origin seed material, veterinary-sanitary requirements regarding animal origin products, subproducts and veterinary drugs, veterinary-sanitary requirements regarding protection and animal welfare and the import, transit and export of products that are the object of veterinarian inspection.

Identification and registering of animals

The 2006 Law No. 231-XVI on the Identification and Registration of Animals establishes basic principles for the organization and implementation of animal identification and registration in the Republic of Moldova. The provisions of the Law refer to cattle, sheep, goats, pigs, and horses, donkeys and their hybrids, but exclude wild animals. The 2007 GD No. 1093 approving regulations on procedures and documents concerning the Animal Identification and Traceability System (AITS), establishes activities, competences, tasks, responsibilities, rules and documents regarding the implementation and operation of the AITS in the country, with a focus on registration, individual identification and registration of each animal and registration of their movements so as to establish traceability.

Protection of plants and phytosanitary quarantine

The 2010 Law No. 228 on Protection of Plants and Phytosanitary Quarantine was amended in 2012 (Law No. 318). This Law is harmonized with Council Directive 2000/29/EU on protective measures against the introduction into the Community of organisms harmful to plants or plant products and against their spread within the Community. The Law is aimed at:

- Prevention of mass distribution of hazardous organisms, prevention of losses of productivity and harvesting of high-quality agricultural products, in particular ecological products;
- Protection of the territory of the country against penetration, distribution and/or drift from other countries of quarantine organisms.

Organic food production

The 2005 Law No. 115-XVI on Ecological Farm Production established rules for organic food production and requirements for the labelling, production processes and import and export of organic food .The Law has been harmonized with the EU *aquis*. The 2006 GD No. 149, on the implementation of the 2005 Law on Ecological Farm Production, approved:

- Regulations regarding the methods and principles of organic food production;
- Regulations regarding the inspection and certification system for organic food production;
- Rules regarding the import and export of organic food products.

The 2008 GD No. 1078, approving the regulation on organic food production and labelling, established requirements for the production of organic food, covering:

- All stages of production, processing and marketing of organic products and their control;
- The use in labelling and advertising of indications applicable to organic production.

The Ministry of Agriculture and Food Industry Order No. 107 of 26 May 2008, regarding the approval of Rules on the registration of business operators in organic food production, established a registration procedure for business operators in organic food production and rules for the monitoring of production processes of organic food.

10.4 Policy framework

National Development Strategy for the period 2008–2011

Among the key measures foreseen by the 2007 NDS for the period 2008–2011 were improving the performance of agriculture and the competitiveness of farming and food products through, in particular:

- Improving the management of farming lands and soil protection;
- Improving natural hazard risk management, preservation and efficient use of natural resources;
- Reorganizing veterinary and phytosanitary services in line with EU norms to secure food safety and promote exports;
- Improving the quality of education in agriculture, by means of in-service training;
- Strengthening rural development services (information and consultation services in agriculture and rural development).

The Strategy implementation report was not available at the time of the review.

Agricultural and Food Sector Development Strategy for the period 2006–2015

The 2006 Agricultural and Food Sector Development Strategy for the period 2006–2015 prioritized the development of the organic agricultural sector by doubling organic production and trebling certified farmed areas by 2015. The Strategy was accompanied by the 2007 Action Plan. It aimed to integrate domestic legislation and practices for organic farming and products with EU requirements and to support the development of the organic sector through research, development and extension. The Strategy has contributed to an increase in the area of certified organic production that has occurred over recent years. In 2008, the Strategy was superseded by the National Strategy for the Sustainable Development of the Agro-industrial Sector for the period 2008–2015.

The Strategy implementation report was not available at the time of the review.

National Strategy for Sustainable Development of the Agro-industrial Sector for the period 2008–2015

The 2008 National Strategy for Sustainable Development of the Agro-industrial Sector for the period 2008–2015 deals with overall coordination at national level of the main political, economic and social actions for the development of the agro-industrial sector. It sets out updated assessments of the agro-food sector's adjustment level to market economy mechanisms and conditions, the main directions for modernizing the agrarian sector, the State's role in the development of the agro-food sector at the post-privatization stage, the expected economic effects and the envisaged strategic risks.

The National Strategy is accompanied by an Action Plan, which consists of measures relating to the legal and institutional framework, agricultural lands consolidation, crop planting and animal breeding, environmentally friendly agriculture, irrigation and viticulture. The drafting of new laws is foreseen in the Action Plan, such as a law on agricultural lands consolidation, a law on low productivity lands, a law on agricultural cadastre, and a law on plant protection and phytosanitary quarantine. Institutional measures foresee the establishment of a phytosanitary agency, an agency for veterinary and animal products safety, and an agricultural inspectorate. The irrigation measures include rehabilitation of the existing system and construction of new irrigation systems.

The other important measures include the first agricultural census, development and implementation of a number of programmes (on technical cultures, vegetables, crops, tobacco, walnut cultivation, etc).

Preserving soil quality is among the strategic objectives of sustainable development of the agro-industrial sector related to the environment. The measures are:

- Ecological reconstruction of degraded soils;
- Preventing and combating landslides;
- Ecological reconstitution of meadowland vegetation;
- Extension of afforested areas and protection forest bands for setting up a green carcass for soil protection;
- Re-establishing and extending humid zones;
- Promoting ecological and genetically unmodified agriculture.

The first General Agricultural Census in the Republic of Moldova (GAC) was carried out during the period 15 March–15 April 2011 according to GD No. 992 of 03 September 2007 and GD No. 371 of 06 May 2010. Until that time, only specialized agricultural censuses were organized in the Republic of Moldova, such as for sown areas (1985), livestock (1992) and perennial plantations (1994).

Programme on Agricultural Lands Consolidation

The 2006 Programme on Agricultural Lands Consolidation is accompanied by the Action Plan. The Action Plan contains concrete deadlines and responsible agencies, but does not include the estimated expenditures. This Programme aims at the ultimate revival of rural communities through land consolidation, primarily by encouraging land markets, reducing transaction costs, facilitating

mortgages, etc. Special attention is given to peasant households, which have an average holding of 1.5 hectares but considerable potential (accounting for some 40 per cent of agricultural land in the country). Moldova Land Consolidation Pilot Project was implemented in the period July 2007–January 2009 by an international consortium (Niras, Sweden; Orbicon, Denmark; Terra Inst., the United States of America; and ACSA, the Republic of Moldova). The project was funded by the World Bank and SIDA (box 10.2).

Soil Fertility Conservation and Improvement Programme for 2011–2020

The 2011 Soil Fertility Conservation and Improvement Programme for 2011–2020 is accompanied by the Action Plan for 2011–2013. The overall task of the Programme is to prevent soil degradation of 877,000 ha of arable lands and to improve soil fertility on the territory of 1.7 million ha up to 2020. Budget allocation of 54 million lei is envisaged for the Programme implementation in 2011–2013. A database with soil quality information was established and it includes a digital map of soils (scale 1:50,000) with the following layers:

- Surface erosion;
- Salinized soils;
- Excessively moisturized soils;
- Landslide-prone lands.

National Programme on organic agri-food production

The 2000 National Programme on Organic Food, Producing and Marketing of Organic Food and Genetically Non-modified Products, recognizes the role of organic food production in the sustainable development of agriculture and includes a set of social, economic and environmental objectives. The latter includes environmental protection, protecting, preserving and increasing soil fertility, development and use of animal farming, and preservation of natural resources

Other policy documents on the agricultural sector have been adopted since 2005 with no direct links to the environment. They include, among others:

- The 2006 National Programme for the Development of Walnut Cultivation up to 2020;
- The 2006 National Programme for the Development of Apiculture for the period 2006–2015;
- The 2007 Concept on the Subsidisation System for Agricultural Producers for the period 2008–2015.

Box 10.2: Moldova Land Consolidation Pilot Project

The specific objectives of the pilot project were to:

1) Test the demand and feasibility of land consolidation with small landowners as the primary target group;
2) Use the pilot experience as the basis for designing a potential national-level approach;
3) Assess the impact of land consolidation at the local level, including on land markets, agricultural production and equity.

The concrete results of the project included:
1) More than 7,000 landowners and almost 27,000 agricultural parcels were identified in the six pilot villages; 49 per cent of interviewed landowners were interested in participating in the project;
2) Baseline reports and a Land Mobility Map were prepared;
3) A Community Area Development Plan was elaborated for each pilot community using participatory principles.

After the pilot project, the Government requested the World Bank and SIDA to fund the scaling up of land consolidation activities. As a result, land consolidation was implemented in 40 additional villages from May 2009 to January 2011 using the same concept as in the pilot project. About 50,000 landowners and 168,000 land parcels were identified in all the villages. A total of 7,520 ha changed ownership, and around 2,600 ha were transferred through long-term leases. The average parcel size increased from 0.65 ha to 0.99 ha and the average farm size increased from 2.43 ha to 2.95 ha.

In 2010, the Government requested FAO to support the preparation of a national land consolidation strategy. The strategy for a 15-year period was drafted during 2010–2011 and it is intended to guide the further scaling up of land consolidation and its implementation in a national programme. Emphasis is initially placed on agricultural development based on the consolidation of parcels and enlargement of farm sizes. It is anticipated that the focus will gradually shift towards more comprehensive rural development projects. The strategy is expected to be adopted by the Government in 2012.

Source: http://www.fig.net/pub/fig2012/ppt/ts03g/TS03G_hartvigsen_6145_ppt.pdf

10.5 Institutional framework

Ministry of Agriculture and Food Industry

The Ministry of Agriculture and Food Industry is responsible for the formulation and promotion of policies and strategies related to the development of the rural sector and food industry. The Ministry has an important role in improving rural livelihoods through increasing farm competitiveness and access to markets, while simultaneously reducing barriers for private investment in the sector. The Ministry also provides research, development, and extension, education and training services through a range of organizations, including the Soil Institute, the Animal Breeding and Veterinary Medicine Institute, the State Agrarian University and the Institute for Field Crops. This last institute focuses on a number of activities, including crop breeding, seed multiplication, farming systems research, organic agriculture development and farm modernization.

Agency for Consultancy and Training in Agriculture

The Agency for Consultancy and Training in Agriculture has an important role as the lead agency for agricultural extension services in the Republic of Moldova. Throughout the country, the Agency employs more than 350 consultants to deliver farmer advisory services via direct consultations, seminars and training on an array of agricultural and production system topics.

General Inspectorate for Phytosanitary Surveillance and Seeds Control

The General Inspectorate for Phytosanitary Surveillance and Seeds Control was established by GD No. 1402 of 9 December 2008 by merging the Republican State Inspection for Plant Protection and its territorial inspectorates, the State Seed Inspection and the State Inspectorate for Bread and Bakery Industry. This merging resulted in the gradual reduction of staff responsible for plant protection from 146 in 2009 to 91 in 2012.

The 2008 Code on Offences ("Contravention Code") limited the authority of the General Inspectorate, as it no longer could enforce legislation on import, trade, storage, transportation and application of pesticides and fertilizers. In the period 2005–2007 the Republican State Inspection for Plant Protection was active in the supervision and control over enforcement of the legislation on plant protection (table 10.13). Unfortunately, no other entity was authorized with these tasks and the supervision and control over enforcement of the legislation on plant protection was discontinued.

Table 10.13: Supervision and control over enforcement of the legislation on plant protection

	Acts	Protocols	Fines collected, lei
2005	869	15	7,100
2006	1,100	27	13,580
2007	1,081	69	28,156

Source: General Inspectorate for Phytosanitary Surveillance and Seeds Control, 2013.

The General Inspectorate issues authorization for import of phytosanitary products. In 2011, 396 authorizations were issued, and 501 were issued in 2012. In 2011, the import of phytosanitary products amounted to 14,191.2 tons, and in 2012, 13,799.6 tons.

All importers of phytosanitary products are obliged to report on a quarterly basis on import, trade and stock balance of phytosanitary products. In the event an importer fails to do so for two consecutive quarters, the General Inspectorate sends a letter to the Licensing Chamber to deprive the importer of its licence. In 2011, 16 letters were sent and 16 importers were deprived of their licences. In 2012, 14 letters were sent and 7 importers were deprived of their licences.

National Agency for Food Safety

On 16 January 2013, GD No. 51 merged the General Inspectorate for Phytosanitary Surveillance and Seeds Control and the Agency for Veterinary Health and Animal Products Safety into the National Agency for Food Safety. The new National Agency is subordinated to the Ministry of Agriculture and Food Industry. According to the same GD, the State Services for Public Health of the Ministry of Health has to share with the National Agency information from its database on State supervision in the field of food safety. The regulation and the organizational structure of the National Agency have also been adopted. The merger will be finalized by the end of 2013.

Agency for Land Relations and Cadastre

The Agency for Land Relations and Cadastre is subordinate to the government and carries out State policy in the field of land management, cadastre, geodesy, cartography and geoinformatics. According to 2010 GD No. 383, the number of staff in the Agency is limited to 41.

Republican Centre of Applied Pedology

The Centre developed the Technical Regulation on Agricultural Soils Protection (adopted by the 2008 GD No. 1157). The Centre also developed the Regulation on Content and Filling in of a Book of the History of a Field (adopted by the Order of the Minister of Agriculture and Food Industry No. 179 of 10 September 2008). Both regulations are not applied in practice. One of the main reasons is that the Ministry of Agriculture and Food Industry has not appointed an organization that is empowered to implement and enforce the regulations.

Institute for Pedology and Agrochemistry named after Nicolae Dimo

The Institute was founded in 1953 and its spheres of activity include five areas: pedology, agrochemistry, pedological biology, soil amelioration and control of soil erosion.

The following projects have been recently implemented by the Institute:

- Evaluation of erosion danger and elaboration of the system of actions for combating soil erosion at the level of river basins (2006–2010). The effect of environmental, agronomic and economic measures to minimize soil erosion has been assessed;
- Assessment of nutritional status and nutrients management on different types and subtypes of soil in field rotation. The economic efficiency of fertilization depending on plant culture, types and subtype of soil has been assessed.

Organic agriculture institutions

According to the 2005 Law on Ecological Farm Production, the inspection and certification bodies are accredited by the Centre of Accreditation and Conformity Assessment for evaluation according to the International Standard EN 45011. Based on this, the Ministry of Agriculture and Food Industry issues an authorization to operate in the country. Supervision of inspection bodies accredited under EN 45011 is under the competence of the Centre of Accreditation and Conformity Assessment.

In order to authorize inspection and certification bodies, the Ministry of Agriculture and Food Industry has established the Commission for Authorization of the Inspection and Certification Bodies with the following composition:

- Deputy Minister and two representatives from the Ministry of Agriculture and Food Industry;
- One representative of the Ministry of Environment;
- One representative of the Ministry of Health.

So far, only foreign organic certification companies are accredited in the Republic of Moldova. These are:

- ICEA Group;
- ACS Ecogruppo Italia-M;
- Biozoo SRL.

Farm associations and agro-industry groups

Farm associations and agro-industry groups are primarily responsible for representing the interests of different sectors of the agricultural community.

A number of these organizations have been recipients of capacity-building efforts and resources from donor-funded projects, and are important channels for the dissemination of information and the collection of data at the producer level. These organizations include the National Farmers Federation, National Federation AgroInform, the UniAgroProject network of 15 regional agricultural producers associations, and local water user organizations.

10.6 Conclusions and recommendations

The Republic of Moldova has adopted strategic documents aiming at achieving sustainable agriculture. Some of them were successfully implemented. However, this effort needs to be continued. Agricultural extension services and capacity-building activities, such as promotion of improved farming techniques and adaptation to climate change, lack sufficient funding.

Recommendation 10.1:
The Government should ensure:

(a) Effective implementation of the strategies and programmes aiming at achieving sustainable agriculture, in particular soil conservation and rehabilitation, and control and abatement of pollutants from agriculture to surface waters and groundwater;
(b) Sufficient financing and support structures for agricultural extension services and capacity-building, including promotion of improved farming techniques and adaptation to climate change.

Until the adoption of the 2008 Code on Offences, the Republican State Inspection for Plant Protection was active in the supervision and control over enforcement of the legislation on plant protection. Since then, no other entity has been authorized with these tasks and the supervision and control over enforcement of the legislation on plant protection has been discontinued.

Recommendation 10.2:
The Government should ensure that the National Agency for Food Safety enjoys full authority in the monitoring and enforcement of the legislation on plant protection.

The Republic of Moldova has made good progress in developing and adopting technical regulations and normative documents on soil protection, e.g. the 2008 Technical Regulation on Agricultural Soils Protection, and the 2008 Regulation on Content and Filling in of a Book of the History of a Field. However, neither regulation has ever been applied in practice. One of the main reasons is that no organization is empowered to implement and enforce the regulations.

Recommendation 10.3:
The Ministry of Agriculture and Food Industry should ensure that an institution is designated and adequate capacity is provided for it to implement and enforce the technical regulations on soil protection.

There is a lack of data concerning the situation on GMOs in the Republic of Moldova, including registered genetically modified plant varieties that are permitted for growing in the country. However, some soy products produced in the country contain GM soy components. As the country would like to increase its export of agricultural products to the EU market, consumers must be assured that these products are GMO free – or not.

Recommendation 10.4:
The Ministry of Environment should prepare a law on genetically modified organisms (GMOs), which will, in particular, ensure that:

(a) Information concerning the situation on GMOs is regularly collected for use in decision-making;
(b) Agricultural products produced in the country are tested for GMO content and consumers are fully informed of the results.

The Republic of Moldova lacks countrywide data on environmentally sound agricultural practices, such as crop rotation. Despite some studies having been conducted, there is no evidence that this agricultural practice is widely applied. New owners of agricultural lands tend to cultivate steep slopes and reduce crop rotation, thus indirectly contributing to soil erosion.

Insufficient crop rotation was recognized as one of the main causes of land degradation in the Republic of Moldova. At the same time, experimental data showed the high role of crop rotation in yield formation and reconfirmed the influence of different crop rotations and fertilization on soil erosion and fertility.

Recommendation 10.5:
The Government should ensure that data on environmentally sound agricultural practices are collected and analyzed by the Ministry of Agriculture and Food Industry and the National Bureau of Statistics.

ANNEXES

Annex I: Implementation of the recommendations in the second review

Annex II: Participation of the Republic of Moldova in multilateral environmental agreements

Annex III: Key data and indicators available for the review

Annex IV: List of major environment-related legislation

Annex I

IMPLEMENTATION OF THE RECOMMENDATIONS IN THE SECOND REVIEW[5]

Chapter 1: LEGAL AND POLICY-MAKING FRAMEWORK

Recommendation 1.1:
Following the 2005 EU-Moldova Action Plan, the Government should acknowledge environmental protection of natural resources as a national priority. For this purpose, it should strengthen the capacity of the environmental authorities and their bodies at national, territorial and local level, so that they are able to perform their functions and adequately respond to environmental priorities expressed in the policy papers. To facilitate the convergence to the EU environmental legislation, a new legal EU harmonization department should be established.

The recommendation was implemented. The Department for Water Management's divisions of European Integration and External Relations, and Management of Waste and Chemical Substances, were created in the Ministry of Environment. In addition, two agencies – "Apele Moldovei" and Fisheries Service – were subordinated to the Ministry.

Recommendation 1.2:
The Government should strengthen the Ministry of Ecology and Natural Resources to ensure that it fulfils main functions such as implementing international environmental commitments and collecting, managing and disseminating environmental information including the annual State of the Environment report and other reports.

The recommendation was implemented. New competences of the Ministry of Environment were set in the 2009 GD No. 847 approving the Regulation regarding the establishment and operation of the Ministry of Environment, its structure and central staff numbers.

The Ministry's staff increased from 33 to 51. National focal points were appointed to coordinate the implementation of multilateral environmental agreements (MEAs), and seven units were established to carry out activities in the framework of selected MEAs. The units are autonomous and are not incorporated in the institutional structure, even if some of them were created by ministerial order.

Recommendation 1.3:
The Ministry of Ecology and Natural Resources should use new approaches in the development of environmental legislation, including convergence with key pieces and approaches to EU framework legislation, and identify ways of overcoming the gaps between strictly single-media oriented environmental laws. It should develop guidance documentation, best practice notes or other information on appropriate working methods.

The recommendation was implemented. The Government is continuing to prioritize reforms towards alignment with EU standards and values, e.g. the proposed new environmental strategy for 2013–2022, and draft laws on environmental protection, EIA and waste follow relevant EU directives.
See also Recommendation 2.1.

Recommendation 1.4:
The Government should ensure the effective functioning of the National Council of Sustainable Development and Poverty Reduction by including the Ministry of Ecology and Natural Resources as a member of this

[5] The second review of the Republic of Moldova was carried out in 2005. During the third review, progress in the implementation of the recommendations in the second review was assessed by the EPR Team based on information provided by the country.

Council in order to improve integration of environmental considerations into other policy sectors, mainly agriculture, energy, industry, regional development and transport.

The recommendation was not implemented. Despite formally functioning until 2008, the National Council of Sustainable Development and Poverty Reduction failed to have any meaningful impact on the development programmes and to properly monitor the implementation of the country's strategies. Due to the extended political crisis, the Council has not been active since 2009.

While many national and sectoral development strategies have been developed, sustainable development principles and targets were reflected in them only partially in an integrated and consistent manner.

Chapter 2: COMPLIANCE AND ENFORCEMENT MECHANISMS

Recommendation 2.1:
The Ministry of Ecology and Natural Resources should in the short term:

- *Draft legislation and necessary by-laws to introduce an integrated permitting system for installations having significant impact on the environment, following the approach of the EU IPPC Directive as a benchmark;*
- *Ensure that self-monitoring requirements for enterprises are included in the permits; and*
- *Institute a simplified permitting scheme for other installations.*

The implementation of this recommendation is ongoing. A new law on environmental protection based on the principles of EU Directive 2010/75/EC (Industrial Emissions Directive) has been drafted that addresses this recommendation. However, the law is still not adopted. Self-monitoring requirements are still not included in the permits.

Recommendation 2.2:
Building on actual partial compliance with the EU Minimum Criteria for Environmental Inspection, the Ministry of Ecology and Natural Resources should:

- *Improve the operational and human resources management of the State Ecological Inspectorate, including staff training, and upgrade its technical capabilities;*
- *Streamline the instruments used to achieve compliance and enforcement. A first step would be to identify particular groups of the regulated community and their impact on ambient environment conditions. Further priorities should then be set among the most problematic geographic areas and the most polluting installations, and enforcement tools selected that will effect the most appropriate enforcement response; and*
- *Improve the existing set of indicators, which currently falls short of measuring both environmental improvements (e.g., pollution reduction amounts) and enforcement results (e.g., compliance rates and timeliness of compliance actions), so that the effectiveness of enforcement can be assessed more accurately.*

The recommendation has been partly implemented. During the period 2007–2010, 57 training events were organized, in which 493 environmental inspectors participated. The analytical laboratory of the State Ecological Inspectorate was strengthened from both a technical and methodological viewpoint. An accreditation system for analytical laboratories was established. For rapid response, there is a plan to acquire four mobile laboratories for regional inspectorates. Industries were ranked according to their impact on air quality (2010 Ministerial Order No. 110 of the Ministry of Environment). However, the part of the recommendation to assess the effectiveness of enforcement by improving indicators, which allow measuring both environmental improvements and enforcement results, has not been implemented.

Recommendation 2.3:
The Ministry of Ecology and Natural Resources should improve the use of the three existing environmental assessment instruments (SEE, EIA and PEE) by linking them closer to the principles to EU EIA Directive and to other compliance assurance mechanisms and increasing public involvement in environmental assessment decisions.

The term "strategic environmental impact assessment" (SEA) does not yet exist in the national legislation. However, the 1996 Law on Ecological Expertise and Environmental Impact Assessment (last amended in 2011)

requires the assessment of the environmental impacts of programmes, plans, schemes, strategies and concepts, which is common international practice of SEA. The Law does not incorporate provisions on such procedures as deciding when and which plans or programmes require SEA.

Recommendation 2.4:
The Government should propose and submit for legislative approval important changes in the application of sanctions against environmental violators by:

- *Allowing administrative imposition of fines;*
- *Increasing the level of fines and indexing them to inflation;*
- *Making managers responsible for infringements; and*
- *Introducing environmental damage assessment based on actual remediation costs.*

The recommendation on increasing the level of administrative fines has been implemented in practice. The level of fines is periodically raised and the relevant legislation reviewed. The total amount of fines imposed has been raised 14 times during the period 2005–2012. The introduction of environmental damage assessment based on actual remediation costs still needs to be implemented.

Chapter 3: INFORMATION, PUBLIC PARTICIPATION AND EDUCATION

Recommendation 3.1:
The Ministry of Ecology and Natural Resources, jointly with the Ministry of Health and Social Protection and in cooperation with the Department of Standardization and Metrology, should review the national monitoring parameters and environmental quality standards:
(a) To limit substantially the number of regulated parameters by making the remaining ones consistent with international standards and guidelines;
(b) To introduce additional parameters and standards monitoring that are required by multilateral environmental agreements and EU environmental directives, and to set time schedules for phasing in those new parameters and standards that could not be introduced immediately; and
(c) To focus on a core set of parameters and standards when planning the upgrading of monitoring stations, equipment and devices, and analytical laboratories including relevant staff retraining.
(See also recommendation 1.3)

The recommendation has been partly implemented. There is progress in the gradual compliance with international, and especially EU, standards. This refers in particular to water quality standards, where the 2011 Law No. 272 on Water and implementing regulations, soon to be in place, are helping align the monitoring requirements and corresponding parameters to the EU legislation. For air, less progress is recorded but international projects implemented in recent years were focusing on the revision of the current air quality standards.

The number of parameters monitored has been reduced and, gradually, new parameters in line with EU and international requirements have been introduced. Modern equipment for monitoring and analysis was provided to some institutions to ensure that additional parameters can be monitored and reported. This situation is uneven across the environmental institutional spectrum, some institutions still facing big challenges in performing basic monitoring and reporting activities. As a result, the quality of the information collected remains questionable and not reliable.

Recommendation 3.2:
The Ministry of Ecology and Natural Resources, in cooperation with the Ministry of Health and Social Protection, the Ministry of Agriculture and Food Industry, the National Bureau of Statistics, the Agency for Forestry "Moldsilva", the State Water Concern "Apele Moldovei", the Agency for Geology "AGeoM" and other institutions concerned, should review the achievements and failures in the implementation of the 1998 Regulation on Establishing of an Integrated Environmental Monitoring System. On the basis of this review they should prepare a decree for Government adoption for the establishment of an institutional structure for interministerial coordination on environmental monitoring and information. The proposal should envisage, among other things:

a) A leading role for the Ministry of Ecology and Natural Resources in this institutional structure together with operational support by a monitoring centre to be established by the Ministry on the basis of its existing observation and information units and additional resources, as appropriate; and
b) The preparation by this institutional structure, taking into account environmental monitoring and information provisions in various national strategies and programmes and international commitments, of a time-bound and consistent set of practical actions aimed at expanding observation networks and the number of parameters measured; improving data collection and exchange; harmonizing reporting with international requirements; and facilitating public access to environmental information.

The recommendation has not been implemented. An integrated monitoring system is not in place in the country. The draft environmental protection law envisages the establishment of such a system alongside the development of an environmental integrated information system. The draft law proposes to establish an agency for environmental protection (EPA), operating under the Ministry of Environment. The draft law was expected to be adopted in 2013; moreover, implementing regulations foreseen in its framework have to be elaborated if the draft law is adopted.

At present, most environment-related institutions have their own database of environmental information and there is no regulated sharing/exchange mechanisms between them. Only aggregated data are provided to the Ministry of Environment, upon request or at regular intervals in relation to various reporting obligations. A SEIS at the country level does not exist. The Ministry of Environment does not have an overview of all environmental data available in the country, their location and/or their quality. The draft environmental protection law contains provisions for the establishment of an integrated environmental information system at the country level coordinated by an EPA – also to be established (see Recommendation 2).

Recommendation 3.3:
The Ministry of Ecology and Natural Resources, in cooperation with the National Bureau of Statistics, the Agency for Forestry "Moldsilva", the State Water Concern "Apele Moldovei", the Agency for Geology "AGeoM", should re-assess the effectiveness of their environmental reporting policies to ensure the publication and uploading onto the Internet of environmental information collected by these institutions, and to make them publicly accessible through Internet, free of charge on a regular basis and in a user-friendly form.

The implementation of this recommendation is ongoing. Access to environmental information has increased considerably over recent years. Most of the environment-related institutions have comprehensive websites and update them regularly. Relevant reports and other publications, legislation and information on projects are available for the public in the national language, free of charge.

A governmental decision of 2010 on e-government boosted considerably the use of modern technology in facilitating public access to environmental information, leading also to the establishment of the Open Data Portal of Moldova in 2011. Since then, the portal has grown continuously and new data sets are regularly added to it.

Recommendation 3.4:
To further improve the participation of public in environmental decision-making, the Ministry of Ecology and Natural Resources should initiate:

- *Implementing fully the 2000 governmental Regulation on Public Participation in the Elaboration and Adoption of Environmental Decisions;*
- *Supplementing the Law on Environmental Protection with including relevant detailed provisions on public participation in environmental permitting, environmental standards setting, and development of laws, regulations, strategies, plans and programmes affecting the environment, taking into account provisions of the applicable multilateral environmental agreements; and*
- *Including civil society representatives into governmental commissions or committees on environmental policy and sustainable development.*

The implementation of this recommendation is ongoing. The legal environment for civil society organizations (CSOs) in the country has considerably improved in recent years. The current legal framework provides for CSOs to freely establish and operate, as well as engage with the government and other stakeholders to achieve their goals. The 2008 Law No. 239 on Transparency of Decision Making determines the requirements to ensure

transparency in decision-making by central government and local authorities, and other public authorities, and regulates the relations between the public authorities and stakeholders with the purpose of ensuring participation in decision-making. In December 2008, the parliament passed the Civil Society Development Strategy for 2008–2011. Establishment of the National Participation Council should be mentioned among recent initiatives. The Council was established in February 2010 as an advisory and liaison body between the government, civil society and the private sector.

Recommendation 3.5:
The Ministry of Education, Youth and Sports, in cooperation with the Ministry of Ecology and Natural Resources and other stakeholders concerned, including NGOs and the mass media, should consider the establishment of a council on education for sustainable development. This body should help promote and facilitate the implementation, at the national level, of the UNECE Strategy for Education for Sustainable Development, paying particular attention to non-formal and informal education of adults (including education on citizen rights) and to the training of policy-makers and judges.

The recommendation has not been implemented. A council on ESD does not exist in the country. A working group was set up in 2006 to consider this recommendation and after one year of discussion the group's activities were discontinued. Currently, there is no indication of possible plans concerning the reopening of discussions between the Ministry of Environment and Ministry of Education for the development of a national strategy for sustainable development.

Chapter 4: INTERNATIONAL AGREEMENTS AND COMMITMENTS

Recommendation 4.1:
In order to improve implementation of the ratified international agreements, the Ministry of Ecology and Natural Resources should:
• Establish clear mandates to the Working Groups for agreement implementation, coordinate their work and report about their results to the Government;
• Strengthen synergies between relevant Working Groups and avoid duplications of activities developed under the agreements; and
• Seek resources necessary to fulfill obligations under these agreements by all means including organizing donors' meetings.

The recommendation has been implemented. The former Ministry of Ecology and Natural Resources issued orders to establish working groups for each of the multilateral environmental agreements (MEAs) to which the Republic of Moldova is a party. The composition of the working groups should be interministerial and reflect the areas of work of a given MEA. In fact, this is the case for only some of the MEAs. Working group members are representatives of the Ministry. One of the reasons for this could be that the order establishing the working groups is a document of the Ministry and is not mandatory for other authorities, and the availability of representatives of other authorities to participate often depends on personal circumstances. The order does not regulate when and how often the working groups should meet. This is decided on an ad hoc basis and varies in practice from MEA to MEA. Some working groups meet regularly to discuss and coordinate activities, whereas others only meet when the text of new legislation needs to be laid down and, in these cases, often the full membership does not meet.

When the focal point for a given MEA is not a representative of the Ministry of Ecology and Natural Resources (but, rather, one of its subordinated institutions), it often happens that the working group member representing the Ministry does not take part in the meetings. Thus, the Ministry's role of coordinating the actions of the working group with national policies is weakened. The non-participation of the Ministry representative is often due to lack of capacity in the Ministry, rather than non-willingness to participate. Cooperation and coordination between the different working groups is left to personal initiative, since there is no framework within which to share information and experiences.

Recommendation 4.2:
The Ministry of Ecology and Natural Resources should analyze the results of implementation of environmental bilateral and multilateral agreements and other forms of bilateral and multilateral cooperation. Based on this analysis, it should identify the priorities for cooperation and concentrate its resources on them. It should

integrate this analysis into its annual report on cooperation with international organizations to the Ministry of Foreign Affairs and European Integration.

The implementation of the recommendation is ongoing. A 2010 Government Decision establishes a coordinating mechanism for support emanating from international cooperation. The State Chancellery is in charge of coordinating activities with the international community. However, according to the Decision, several aspects and projects of international cooperation may not fall under this regime and would therefore be left without a coordinating mechanism.

At the beginning of 2013, the new structure within the State Chancellery, aiming at linking national priorities to international cooperation, was made operational. It is not yet possible to assess the effectiveness of the new structure.

Chapter 5: ECONOMIC INSTRUMENTS AND ENVIRONMENTAL FUNDS

Recommendation 5.1:
The Ministry of Finance in cooperation with the Ministry of Economy and Trade, and the Ministry of Ecology and Natural Resources, should assure the realization of the Republic of Moldova's Millennium Development Goals objectives pertaining to sustainable development. The environment should be made a priority area in both the Government's medium-term budget framework and related annual budgets to assure financing of the key environmental actions specified in the national Economic Growth and Poverty Reduction Strategy Paper.

The implementation of the recommendation is ongoing. Progress in achieving MDG7 has been uneven reflecting, notably, the lack of financial resources. Progress concerning the target of increasing the area covered by forests has been slow, and the target is likely to be missed. The target of increasing the share of protected areas was already achieved in 2007. Progress concerning the target of enhancing access to water and sanitation infrastructure has been slow. This holds, notably, for access to sanitation services in rural areas. The latter target will likely not be achieved. Another important area of concern is waste management.

Recommendation 5.2:
The Ministry of Finance and the Ministry of Ecology and Natural Resources should increase the "ad quantum" excise tax rates on petrol and diesel while differentiating them according to environmental characteristics with the objective to significantly increase the price of diesel versus petrol to reflect its environmental impact. At the same time, they should phase out the "ad valorem" excises on imported fuel.

The implementation of the recommendation is ongoing. There have been considerable increases in specific (i.e. *ad quantum)* excise rates, which have contributed to the upward trend in prices of motor fuels. The excise on imported fuel (a pollution tax) still exists, but the tax rate has not been changed.

Recommendation 5.3:
The Ministry of Ecology and Natural Resources and the Ministry of Finance should streamline the system of pollution charges, introducing a small number (less than ten) on measurable priority pollutants and eliminating all other charges. It should set the rates of the new charges at levels that will influence the polluters' behaviour significantly.

This recommendation has not been implemented. There have been no significant changes made to the system of pollution charges.

Chapter 6: EXPENDITURES FOR ENVIRONMENTAL PROTECTION

Recommendation 6.1:
The Ministry of Ecology and Natural Resources should identify the priority environmental issues among the already approved national strategies, programmes and action plans. These issues should be consistent with the relevant priorities of the 2004-2006 Economic Growth and Poverty Reduction Strategy Paper, the EECCA Environmental Partnership Strategy and the EU-Moldova Action. The Ministry should set clear measurable targets with related actions for their realization and provide justification of necessary financial resources. The Ministry, in cooperation with other relevant ministries and other governmental agencies, should identify

sources of financing that may include the State budget, the National Environmental Fund and external funding by development partners.

This recommendation has been implemented. The main source of domestic environmental expenditures is the National Environmental Fund (NEF). Available resources have significantly increased since 2008 (due to a newly established product charge), but the overall size of resources is still small relative to the environmental problems in the country. The newly established National Fund for Regional Development also supports environment-related projects. Reliance on foreign assistance remains considerable.

Recommendation 6.2:
The Ministry of Ecology and Natural Resources should restructure the management of the National and Local Environmental Funds in line with the recommendations of the 2002 Performance Review of the funds. In particular:

- *The capacity of the secretariats of the funds should be expanded to assure proper assessment of the project proposals and evaluation of the quality of implemented projects. The expanded secretariats should be funded from the revenues of the funds.*
- *The Administrative Councils of the environmental funds should set guidelines for appraisal of project proposals, ranking in accordance with priority and expected environmental benefits. The Administrative Councils should ensure that the funds' available resources are utilized to the maximum possible extent, and that annual expenditures of the funds are equal or close to annual revenues; and*
- *The Ministry should consider introducing best practices of the Moldova Social Investment Fund into the management of the National and Local Environmental Funds and into the procedure of selecting projects for funding.*
- *The Administrative Councils of the environmental funds should increase the capacity of the National Environmental Fund to prepare project proposals for external funding, coordinate fundraising activities, and monitor project implementation.*

This recommendation has been implemented. The human resources of the National Environmental Fund (NEF) have been strengthened (by an additional five staff), but there are still concerns about the performance of the NEF as regards issues of procedures and managerial capacities, project cycle management, accountability and resource management.

Although the aggregate expenditures by the local environmental funds are much more limited than those of the NEF (on average, each of the 36 local funds spent some 111,000 lei (€7,325) per annum during 2010–2012), nonetheless, they do have sufficient capacity to ensure proper assessment of project proposals and evaluation of the quality of implemented projects.

Recommendation 6.3:
The National Bureau of Statistics, in cooperation with the Ministry of Ecology and Natural Resources and other relevant governmental agencies, should review the current system and methodology of defining and accounting for environmentally related expenditures in the context of best international practices. The improved accountability might serve as a basis for the Ministry to solicit the Government to increase the level of State environmental funding.

This recommendation has not been implemented. There is no new information on this issue.

Chapter 7: ENVIRONMENTAL MANAGEMENT IN AGRICULTURE AND FORESTRY

Recommendation 7.1:
The Ministry of Agriculture and Food Industry in cooperation with the Ministry of Ecology and Natural Resources should, as a priority, develop a programme for implementing Guidelines for Good Agricultural Practices that should be used as a key instrument to guide policy development and extension services in the agricultural sector. Advising farmers on how to counteract erosion efficiently and effectively should be one of the central components of this implementation programme.

This recommendation has not been implemented. A programme for implementing Guidelines for Good Agricultural Practices was not developed. However, the 2011 Soil Fertility Conservation and Improvement

Programme for 2011–2020 contains measures to prevent soil degradation of 877,000 ha of arable lands by 2020 and envisages the training of farmers on how to counteract erosion and improve soil fertility.

Within the GEF project Pollution Control in Agriculture, 30 trainers have been trained on how to inform farmers on implementation of environmentally friendly technologies and efficient and effective measures to counteract erosion. The trainers conducted a number of seminars at the local level in which some 1,500 farmers participated.

Recommendation 7.2:
The Government should delegate the lead role to the Ministry of Ecology and Natural Resources for, in coordination with the Ministry of Agriculture and Food Industry, the Agency for Forestry "Moldsilva", the State Water Concern "Apele Moldovei" and the Agency for Land Relations and Cadastre with the active involvement of farmers, NGOs, and municipal and district authorities, elaborating all ongoing and planned land management and afforestation programmes. These efforts should in particular focus on achieving the following important objectives:

- *Improvement of the management and protection of pasture;*
- *Establishment of water protection zones according to the existing laws and regulations; and*
- *Establishment of the National Ecological Network of Moldova.*

This recommendation has not been fully implemented. In 2010, in order to improve the management and protection of pastures, the Government adopted the Regulations on pasturage and haymaking.

The 2011 Law No. 272 on Water contains provisions on establishment and management of water protection zones. The 1995 Law No. 440-XIII on Water Protection Zones and Strips of Rivers and Reservoirs was amended accordingly in 2012. The 2007 Law on the National Environmental Network lays down a good basis for establishment and development of a national environmental network as an intrinsic part of the Pan-European Ecological Network (Emerald Network). The 2007 Law was subsequently supported by the 2011 GD on Approval of the National Programme on the Environmental Network for 2011–2018. Only minor progress has been made in creating the network in practical terms.

Recommendation 7.3:
The Agency for Land Relations and Cadastre and the Agency for Forestry "Moldsilva" should develop a national Geographical Information System (GIS) in order to provide uniform presentation of topographic information and information on real estate (cadastre), which would facilitate all spatial planning purposes and related decision-making.

This recommendation has not been implemented. A national GIS with topographic information and information on real estate (cadastre) has not been developed. The GIS maps and cadastre data are available for protected areas only.

Recommendation 7.4:
The Ministry of Agriculture and Food Industry should ensure long-term financing under the aegis of scientific institutions with the objective to using the results of applied research and introducing environmentally friendly technologies and practices in agriculture.

This recommendation has not been fully implemented. A number of scientific institutions subordinated to the Ministry of Agriculture and Food Industry are functioning in the Republic of Moldova, such as the Institute for Pedology and Agrochemistry named after Nicolae Dimo, the Republican Centre of Applied Pedology, and the Institute of Horticulture and Food Technology. Although they produce good quality results from applied research, these results are not widely applied in practice.

Recommendation 7.5:
The Government should make a proposal to amend the Forest Code in order to give to the Ministry of Ecology and Natural Resources the authority to approve the forestry management plans, transferring to it the structure responsible for developing them. It should improve the supervision of forest exploitation and should be authorized to impose higher fines. Capacity building and its staffing should be adjusted adequately.

See also Recommendation 1.1.

This recommendation has not been fully implemented. The Agency "Moldsilva" and the State Environmental Inspectorate accordingly developed a proposal to amend the Forest Code, which is expected to be adopted by the parliament in 2014.

Chapter 8: ENVIRONMENTAL MANAGEMENT IN INDUSTRIAL ACTIVITIES

Recommendation 8.1:
The Ministry of Ecology and Natural Resources in cooperation with the Ministry of Industry and Infrastructure and other relevant stakeholders should develop an integrated system of indicators for monitoring the environmental impact of industries. This system should enable the establishment of targets that would be used for setting priorities for environmental impact mitigation in industrial development strategies.

This recommendation has not been fully implemented. Indicators for monitoring the impact of industry on the environment were developed based on the indicators recommended by the ECE Working Group on Monitoring and Assessment. The implementation is proceeding smoothly.

Recommendation 8.2:
The Ministry of Economy and Trade should coordinate relevant institutions more effectively, monitor the implementation of sectoral programmes, and ensure that environmental issues are integrated effectively into these programmes.

This recommendation has not been fully implemented. In 2010, the e-governance programme was launched to monitor the implementation of sectoral programmes. Environmental concerns are integrated during the interministerial procedure before the adoption of sectoral strategies, programmes and action plans.

Recommendation 8.3:
The Ministry of Industry and Infrastructure should initiate the restructuring of the National Energy Conservation Agency and the National Fund for Energy Conservation based on the experience of other countries on energy savings and energy efficiency improvements.

This recommendation has not been fully implemented. The 2010 Law No. 142 on Energy Efficiency was adopted to support the development of the energy sector and energy efficiency. In order to ensure the growth of energy efficiency and fuel, and the use of the most efficient energy and manufacturing technologies that reduce energy intensity and prevent environmental impact, the National Energy Efficiency Programme for the period 2011–2020 was adopted in 2011 (GD No. 833). The 2012 GD No. 401 approved the Regulations on the organization and functioning of the Energy Efficiency Fund. So far, there is no implementation report on the Programme.

Recommendation 8.4:
The Ministry of Economy and Trade in collaboration with the Ministry of Finance and the Ministry of Ecology and Natural Resources should improve economic incentives (for instance, reduction of profit taxes and other taxes for industrial production based on waste recycling and reuse, reduced charge rate for enterprises reducing their waste, etc.), elaborate measures for promoting recycling and disposal of waste; stimulate energy efficiency improvements; and enhance clean production methods based on related national programmes.

This recommendation has not been fully implemented. A draft waste act and national waste management strategy were prepared in line with EU priorities. However, the draft waste act's adoption is delayed. Current waste legislation dates from prior to 2005.

Annex II

PARTICIPATION OF THE REPUBLIC OF MOLDOVA IN MULTILATERAL ENVIRONMENTAL AGREEMENTS

	Worldwide agreements	Republic of Moldova	
Year		**Status**	**Year**
1951	(ROME) International Plant Protection Convention	**Ad**	**2001**
1961	(PARIS) International Convention for the Protection of New Varieties of Plants		
1971	(RAMSAR) Convention on Wetlands of International Importance especially as Waterfowl Habitat	**Ra**	**1999**
	1982 (PARIS) Amendment		
	1987 (REGINA) Amendments		
1971	(GENEVA) Convention on Protection against Hazards from Benzene (ILO 136)		
1972	(PARIS) Convention Concerning the Protection of the World Cultural and Natural Heritage	**Ra**	**2002**
1972	(LONDON, MOSCOW, WASHINGTON) Convention on the Prohibition of the Development, Production and Stockpiling of Bacteriological (Biological) and Toxin Weapons, and their Destruction		
1972	(GENEVA) International Convention for Safe Containers		
1973	(WASHINGTON) Convention on International Trade in Endangered Species of Wild Fauna and Flora	**Ac**	**2001**
	1983 (GABORONE) Amendment		
	1987 (BONN) Amendment		**2001**
1977	(GENEVA) Convention on Protection of Workers against Occupational Hazards from Air Pollution, Noise and Vibration (ILO 148)		
1979	(BONN) Convention on the Conservation of Migratory Species of Wild Animals	**Ra**	**2001**
	1991 (LONDON) Agreement Conservation of Bats in Europe	**Ra**	**2001**
	1992 (NEW YORK) Agreement on the Conservation of Small Cetaceans of the Baltic and North Seas (ASCOBANS)		
	1995 (THE HAGUE) African/Eurasian Migratory Waterbird Agreement (AEWA)	**Ra**	**2001**
	1996 (MONACO) Agreement on the Conservation of Cetaceans of the Black Sea, Mediterranean Sea and Contiguous Atlantic Area (ACCOBAMS)		
1985	(VIENNA) Convention for the Protection of the Ozone Layer	**Ac**	**1996**
	1987 (MONTREAL) Protocol on Substances that Deplete the Ozone Layer	**Ac**	**1996**
	1990 (LONDON) Amendment to Protocol	**Ac**	**2001**
	1992 (COPENHAGEN) Amendment to Protocol	**Ac**	**2001**
	1997 (MONTREAL) Amendment to Protocol	**Ac**	**2005**
	1999 (BEIJING) Amendment to Protocol		
1986	Convention Concerning Safety in the Use of Asbestos		
1986	(VIENNA) Convention on Early Notification of a Nuclear Accident		
1986	(VIENNA) Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency		
1989	(BASEL) Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal	**Ac**	**1998**
	1995 Ban Amendment		
	1999 (BASEL) Protocol on Liability and Compensation		
1992	(RIO) Convention on Biological Diversity	**Ra**	**1995**
	2000 (CARTAGENA) Protocol on Biosafety	**Ra**	**2003**
1992	(NEW YORK) Framework Convention on Climate Change	**Ra**	**1995**
	1997 (KYOTO) Protocol	**Ac**	**2003**
1993	(PARIS) Convention on the Prohibition of the Development, Production, Stockpiling and Use of Chemical Weapons and on Their Destruction		

	Worldwide agreements	Republic of Moldova	
Year		**Status**	**Year**
1994	(PARIS) Convention to Combat Desertification	**Ac**	**1999**
1998	(ROTTERDAM) Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade	**Ac**	**2005**
2001	(STOCKHOLM) Convention on Persistent Organic Pollutants	**Ra**	**2004**

Ac = Accession; Ad = Adherence; De = denounced; Si = Signed; Su = Succession; Ra = Ratified.

	Regional and subregional agreements	Republic of Moldova	
Year		**Status**	**Year**
1950	(PARIS) International Convention for the Protection of Birds		
1957	(GENEVA) European Agreement - International Carriage of Dangerous Goods by Road (ADR)		
	European Agreement Concerning the International Carriage of Dangerous Goods by Road (ADR) Annex A Provisions Concerning Dangerous Substances and Articles Annex B Provisions Concerning Transport Equipment and Transport Operations		
1958	(GENEVA) Agreement - Adoption of Uniform Conditions of Approval and Reciprocal Recognition of Approval for Motor Vehicle Equipment and Parts.		
1958	Convention Concerning Fishing in the Water of the Danube		
1968	(PARIS) European Convention - Protection of Animals during International Transport		
	1979 (STRASBOURG) Additional Protocol		
1969	(LONDON) European Convention - Protection of the Archaeological Heritage		
1976	(STRASBOURG) European Convention for the Protection of Animals Kept for Farming Purposes		
1979	(BERN) Convention on the Conservation of European Wildlife and Natural Habitats	**Ra**	**1993**
1979	(GENEVA) Convention on Long-range Transboundary Air Pollution	**Ac**	**1995**
	1984 (GENEVA) Protocol - Financing of Co-operative Programme (EMEP)		
	1985 (HELSINKI) Protocol - Reduction of Sulphur Emissions by 30%		
	1988 (SOFIA) Protocol - Control of Emissions of Nitrogen Oxides		
	1991 (GENEVA) Protocol - Volatile Organic Compounds		
	1994 (OSLO) Protocol - Further Reduction of Sulphur Emissions		
	1998 (AARHUS) Protocol on Heavy Metals	**Ra**	**2002**
	1998 (AARHUS) Protocol on Persistent Organic Pollutants	**Ra**	**2002**
	1999 (GOTHENBURG) Protocol to Abate Acidification, Eutrophication and Ground-level Ozone	**Si**	**2000**
1991	(ESPOO) Convention on Environmental Impact Assessment in a Transboundary Context	**Ac**	**1994**
	2003 (KIEV) Protocol on Strategic Environmental Assessment	**Si**	**2003**
1992	(HELSINKI) Convention on the Protection and Use of Transboundary Waters and International Lakes	**Ra**	**1994**
	1999 (LONDON) Protocol on Water and Health	**Ra**	**2005**
	2003 (KIEV) Protocol on Civil Liability and Compensation for Damage Caused by the Transboundary Effects of Industrial Accidents on Transboundary Waters	**Si**	**2003**
1992	(HELSINKI) Convention on the Transboundary Effects of Industrial Accidents	**Ra**	**1994**
1993	(OSLO and LUGANO) Convention - Civil Liability for Damage from Activities Dangerous for the Environment		
1994	(SOFIA) Convention on Cooperation for the Protection and Sustainable Use of the Danube River	**Ra**	**1999**
1994	(LISBON) Energy Charter Treaty		
	1994 (LISBON) Protocol on Energy Efficiency and Related Aspects		
1998	(AARHUS) Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters	**Ra**	**1999**
	2003 (KIEV) Protocol on Pollutant Release and Transfer Register	**Si**	**2003**
2000	(FLORENCE) Convention on European Landscape	**Ra**	**2002**

Ac = Accession; Ad = Adherence; De = denounced; Si = Signed; Su = Succession; Ra = Ratified.

Annex III

KEY DATA AND INDICATORS AVAILABLE FOR THE REVIEW

Air pollution	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**
Emissions of SO_2								
- Total (1,000 t)	2.4	1.9	1.7	1.5	1.6	5.0	5.8	..
- by sector (1,000 t)								
Energy	0.1	0.0	0.0	0.0	0.2	0.1	0.0	..
Industry	0.3	0.2	0.2	0.3	0.2	0.2	0.4	..
Transport	..	..	..	..	..	3.9	4.5	..
Other	2.0	1.7	1.5	1.2	1.2	0.8	0.9	..
- per capita (kg/capita)	..	..	..	..	..	..	..	..
- per unit of GDP (kg/1,000 US$ (2005) PPP)	..	..	..	..	..	..	..	..
Emissions of NO_X (converted to NO_2)								
- Total (1,000 t)	22.9	21.3	21.7	30.7	21.4	17.6	20.0	..
- by sector (1,000 t)								
Energy	1.6	1.3	0.6	0.6	0.7	0.6	0.5	..
Industry	0.8	1.1	0.9	1.0	0.6	0.8	0.7	..
Transport	20.0	18.4	19.7	28.7	19.6	15.8	18.4	..
Other	0.5	0.5	0.5	0.4	0.5	0.4	0.4	..
- per capita (kg/capita)	..	..	..	..	..	..	..	..
- per unit of GDP (kg/1,000 US$ (2005) PPP)	..	..	..	..	..	..	..	..
Emissions of ammonia (NH_3)								
- Total (1,000 t)	0.1	0.1	0.0	0.1	0.1	0.1	0.1	..
- by sector (1,000 t)								
Energy	0.0	0.0	0.0	0.0	0.0	0.0	0.0	..
Industry	0.1	0.1	0.0	0.0	0.1	0.0	0.0	..
Transport	..	..	..	..	..	..	..	..
Other	0.0	0.0	0.0	0.1	0.0	0.1	0.1	..
- per capita (kg/capita)	..	..	..	..	..	..	..	..
- per unit of GDP (kg/1,000 US$ (2005) PPP)	..	..	..	..	..	..	..	..

Air pollution	2005	2006	2007	2008	2009	2010	2011	2012
Emissions of total suspended particles (TSP)								
- Total (1,000 t)	..	..	..	..	..	..	..	..
- by sector (1,000 t)								
Energy	..	..	..	..	..	..	..	..
Industry	..	..	..	..	..	..	..	..
Transport	..	..	..	..	..	..	..	..
Other	..	..	..	..	..	..	..	..
- per capita (kg/capita)	..	..	..	..	..	..	..	..
- per unit of GDP (kg/1,000 US$ (2005) PPP)	..	..	..	..	..	..	..	..
Emissions of non-methane volatile organic compounds (NMVOC)								
- Total (1,000 t)	1.1	1.0	1.1	1.5	1.5	1.5	1.6	..
- by sector (1,000 t)								
Energy	0.0	0.0	0.0	0.0	0.0	0.0	0.0	..
Industry	0.3	0.3	0.3	0.5	0.3	0.2	0.3	..
Transport	..	..	..	..	..	..	..	..
Other	0.8	0.7	0.8	1.0	1.2	1.3	1.3	..
- per capita (kg/capita)	..	..	..	..	..	..	..	..
- per unit of GDP (kg/1,000 US$ (2005) PPP)	..	..	..	..	..	..	..	..
Emissions of persistent organic pollutants (PCBs, dioxin/furan and PAH)								..
- Total (1,000 t)	0.1	0.0	0.0	0.0	0.0	0.0	0.0	..
- by sector (1,000 t)								
Energy	0.0	0.0	0.0	0.0	0.0	0.0	0.0	..
Industry	0.0	0.0	0.0	0.0	0.0	0.0	0.0	..
Transport	..	..	..	..	..	..	..	..
Other	0.1	0.0	0.0		-	0.0	0.0	..
- per capita (kg/capita)	..	..	..	..	..	..	..	..
- per unit of GDP (kg/1,000 US$ (2005) PPP)	..	..	..	..	..	..	..	..
Emissions of heavy metals	..	..	..	..	..	..	..	..
- Total cadmium (t)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	..
- Total lead (t)	0.5	0.0	0.6	0.4	0.4	0.7	0.2	..
- Total mercury (t)	..	..	..	0.0	0.1	0.1	0.1	..
Emissions of CO	..	..	..	..	..	..	..	..
- Total (t)	120,752.7	111,105.9	132,112.6	163,775.6	117,014.6	113,589.5	139,181.8	..

Climate Change	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**
Greenhouse gas emissions (total of CO_2, CH4, N_2O, CFC, etc.) expressed in CO_2 eq.	..	..	..	..	..	..	..	..
- Total aggregated emissions (1,000 t) without LULUCF	..	..	..	..	..	..	..	..
- Total aggregated emissions (1,000 t) with LULUCF	..	..	..	..	..	..	..	..
- by sector (1,000 t)	..	..	..	..	..	..	..	..
Energy	..	..	..	..	..	..	..	..
Energy industries	..	..	..	..	..	..	..	..
Manufacturing industries and construction	..	..	..	..	..	..	..	..
Transport	..	..	..	..	..	..	..	..
Other sectors	..	..	..	..	..	..	..	..
Other	..	..	..	..	..	..	..	..
Fugitive emissions	..	..	..	..	..	..	..	..
Industry	..	..	..	..	..	..	..	..
Solvent and other product use	..	..	..	..	..	..	..	..
Agriculture	..	..	..	..	..	..	..	..
Land use, land use change and forestry (LULUCF)	..	..	..	..	..	..	..	..
Waste								
Other	..	..	..	..	..	..	..	..
- per capita (t CO_2 eq/capita)	..	..	..	..	..	..	..	..
- per unit of GDP (t CO_2 eq/1,000 US$ (2005) PPP)	..	..	..	..	..	..	..	..
Total CO2 emissions (without LULUCF) (1,000 t) of	12,939.9	12,118.0	11,389.4	13,121.6	13,124.3	13,276.1	..	..
Carbon dioxide (CO_2)	8,367.8	7,699.6	7,651.5	8,730.7	8,960.7	8,885.2	..	..
Nitrous Oxide (N_2O)	1,662.2	1,583.3	984.6	1,621.8	1,393.5	1,607.1	..	..
Methane (CH_4)	2,870.4	2,787.8	2,692.5	2,692.3	2,682.5	2,680.8	..	..
Perfluorocarbons (PFCs)	..	..	..	..	..	..	..	..
Hydrofluorocarbons (HFCs)	39.4	47.1	60.4	76.3	87.1	102.4	..	..
Sulfur hexafluoride (SF_6)	..	..	..	..	..	..	..	..
Total CO_2 emissions (with LULUCF) (1,000 t) of	12,835.7	11,715.2	8,779.6	13,252.5	12,252.8	13,302.5		
Carbon dioxide (CO_2)	8,263.2	7,296.4	5,038.8	8,860.7	8,088.7	8,911.3	..	..
Nitrous Oxide (N_2O)	1,662.3	1,583.5	985.9	1,622.2	1,393.7	1,607.2	..	..
Methane (CH_4)	2,870.6	2,788.1	2,694.2	2,692.9	2,682.8	2,681.0	..	..
Perfluorocarbons (PFCs)	..	..	..	..	..	..	..	..
Hydrofluorocarbons (HFCs)	..	..	..	..	..	..	..	..
Sulfur hexafluoride (SF6)	..	..	..	..	..	..	..	..

Ozone layer	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**
Consumption of ozone-depleting substances (ODS) (t of ODS)	15.3	12.7	11.3	2.8	1.2	0.7	..	..

Water*	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**
Renewable freshwater resources (million m^3/year)	..	..	..	..	..	..	..	..
Gross freshwater abstracted (million m^3/year)	852.0	854.0	885.0	861.0	865.0	851.0	847.0	850.0
- Share of water losses in total water abstraction (%)	7.8	7.8	8.5	7.8	8.1	7.8	7.3	7.5
Water exploitation index (water abstraction/renewable freshwater resources x 100)	..	..	..	..	..	..	..	..
Total water use by sectors (million m^3)	785	787	809	794	795	785	785	786
- Agriculture	35	36	36	37	38	40	39	39
- Households	120	120	125	124	120	118	119	118
- Industrial use	583	583	581	581	580	581	580	580
of which: Water used for cooling	557	557	557	557	556	556	556	..
- other	47	48	67	52	57	46	47	49
Household water use per capita (l/capita/day)	91.5	91.7	95.1	95.2	92.2	90.8	91.6	90.8

*Data are presented in total for the country

Ecosystems and biodiversity	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**
Protected areas								
- Total area (ha)	67,090.08	67,090.08	161,795.58	161,795.58	161,795.58	161,795.58	161,795.58	161,795.58
Percentage of protected areas								
Ia Strict Nature Reserve	28.88	28.88	11.97	11.97	11.97	11.97	11.97	11.97
Ib Wilderness Area	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
II National Park	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
III Natural Monument	4.33	4.33	1.79	1.79	1.79	1.79	1.79	1.79
IV Habitat / Species Management Area	11.92	11.92	4.94	4.94	4.94	4.94	4.94	4.94
V Protected Landscape / Seascape	51.90	51.90	21.50	21.50	21.50	21.50	21.50	21.50
VI Managed Resource Protected Area	2.31	2.31	0.96	0.96	0.96	0.96	0.96	0.96
Forests and other wooded land								
- Total forested area (% of total land area)	12.2	12.2	12.3	12.5	12.5	12.5	12.5	12.5
- Total forested and wooded area (km^2)	4,120.0	4,131.1	4,179.5	4,231.4	4,233.3	4,235.8	4,236.4	4,237.1
- Semi-natural. km^2	1,960.7	1,960.9	1,961.7	1,962.3	1,963.0	1,964.1	1,964.5	1,965.1
- Plantation km^2	2,159.3	2,170.2	2,217.8	2,269.1	2,270.3	2,271.7	2,271.9	2,272.0
- Undisturbed by humans (km^2)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
- Area of regeneration (km^2)	308.2	325.5	389.6	365.9	360.2	274.3	436.1	504.7

Ecosystems and biodiversity	2005	2006	2007	2008	2009	2010	2011	2012
Share of threatened species (IUCN categories) in total number of species (animals):	116.0	116.0	116.0	116.0	116.0	116.0	213.0	213.0
- mammals (%)	19.2	19.2	19.2	19.2	19.2	19.2	25.4	25.4
- birds (%)	53.4	53.4	53.4	53.4	53.4	53.4	52.6	52.6
- fish (%)	16.4	16.4	16.4	16.4	16.4	16.4	14.4	14.4
- reptiles (%)	11.0	11.0	11.0	11.0	11.0	11.0	7.6	7.6
Share of threatened species (IUCN categories) in total number of species (plants):	..	..	..	..	..	..	..	..
- vascular plants (%)	22,6	22,6	21,9	21,9	21,9	21,9	24,8	24,8

Land resources and soil	2005	2006	2007	2008	2009	2010	2011	2012
Land area (km^2)	33,846	33,846	33,846	33,846	33,846	33,846	33,846	..
Built-up and other related area (% of total land area)	7.0	7.0	7.0	7.0	6.9	6.9	6.9	..
Soil erosion, hectares	877,644	877,644	877,644	877,644	877,644	877,644	877,644	..
- % of total land	25.9	25.9	25.9	25.9	25.9	25.9	25.9	..
- % of agricultural land	34.9	34.9	35.0	35.1	30.1	35.1	35.1	..
Total consumption of mineral fertilizers per unit of agricultural land (kg/ha)	18.4	18.3	23.0	25.2	19.4	22.8	27.2	..
Total consumption of organic fertilizers per unit of agricultural land (kg/ha)	40.0	10.0	10.0	10.0	10.0	20.0	30.0	..
Total consumption of pesticides per unit of agricultural land (kg/ha):	..	..	..	..	..	..	..	..
Insecticides	..	..	..	..	..	1.3	1.6	..
Fungicides	..	..	..	..	..	3.2	3.5	..
Herbicide	..	..	..	..	..	2.1	2.5	..
Biological	..	..	..	..	..	3.3	2.9	..
Other	..	..	..	..	..	0.8	1.2	..

Energy	2005	2006	2007	2008	2009	2010	2011	2012
Total final energy consumption (TFC) (Mtoe)*	2.3	2.3	2.2	2.2	2.1	2.2	2.2	..
- by fuel	1.9	1.9	1.9	1.9	1.8	1.8	1.9	..
Coal	0.1	0.1	0.1	0.1	0.1	0.1	0.1	..
Petroleum	0.6	0.6	0.7	0.7	0.7	0.7	0.8	..
Gas	1.2	1.2	1.1	1.1	1.0	1.0	1.0	..
Nuclear	..	..	..	..	..	..	..	..
Renewables	..	..	..	..	..	..	..	..
- by sector**	1.4	1.4	1.3	1.3	1.3	1.4	1.5	..
Industry	0.2	0.2	0.2	0.1	0.1	0.1	0.1	..
Transport	0.3	0.3	0.3	0.3	0.3	0.4	0.4	..

Energy	2005	2006	2007	2008	2009	2010	2011	2012
Agriculture	0.1	0.1	0.1	0.1	0.0	0.0	0.0	..
Services	0.1	0.1	0.1	0.1	0.2	0.2	0.2	..
Households	0.7	0.7	0.6	0.6	0.7	0.7	0.7	..
Electricity consumption (million kWh)	2,921.0	3,215.0	3,364.0	3,428.0	3,378.0	3,486.0	3,571.0	..
Energy intensity TPES/GDP (PPP) (toe/1,000 US$ (2005) PPP)***	0.06	0.05	0.04	0.03	0.03	0.03	0.03	..

* The indicator represents the gross inland consumption, which is calculated using the formula: production + import-export + change in stock
** The indicator represents the technological final consumption recorded, which includes non-energy consumption, but excludes the consumption for processing, use in energy sectors and energy distribution losses
*** The indicator represents the total energy consumption (gross inland consumption) relative to gross domestic product, at current prices expressed in thousands (tep/1,000 lei)

Transportation	2005	2006	2007	2008	2009	2010	2011	2012
Passenger transport demand (million passenger/km)	3,548.9	3,793.7	4,187.1	4,429.7	3,932.7	3,993.4	4,286.3	..
by mode:								..
train	355.0	471.4	468.2	485.6	422.8	398.8	363.1	..
road transport	2,058.7	2,206.1	2,475.5	2,598.9	2,300.1	2,416.7	2,685.4	..
water transport	0.3	0.2	0.2	0.2	0.2	0.2	0.2	..
air transport	439.7	480.9	549.6	637.5	603.8	750.8	837.3	..
Passengers transported by air transport (million passengers)	0.4	0.4	0.4	0.5	0.5	0.6	0.7	..
Freight transport demand (million ton km)	5,459.6	6,242.2	5,864.6	5,840.6	3,773.6	4,193.1	4,795.2	..
by mode:								..
train	3,052.9	3,673.2	3,120.2	2,872.7	1,058.2	958.6	1,195.7	..
road transport	2,405.3	2,567.1	2,742.5	2,966.5	2,713.7	3,232.4	3,597.3	..
water transport	0.4	0.6	0.6	0.8	0.6	0.4	0.5	..
air transport	1.0	1.3	1.3	1.2	1.1	1.7	1.7	..
Number of passenger cars (including taxis), vehicles	292,994.0	319,311.0	338,944.0	366,351.0	386,365.0	404,290.0	426,973.0	..
Average age of passenger cars	..	..	..	..	..	..	..	..

Waste	2005	2006	2007	2008	2009	2010	2011	2012
Total waste generation	..	..	..	..	..	..	..	..
of which:								
- Hazardous waste (t)	834.8	633.7	610.1	756.5	1,125.1	404.0	528.0	417.8
- Non-hazardous industrial waste (1,000 t)	2,995.4	2,421.6	2,841.7	3,405.9	2,487.9	1,860.3	1,845.3	2,104.2
- Municipal waste (1,000 m^3)	1,292.4	1,381.4	1,819.5	2,172.8	2,267.6	2,359.5	2,401.9	2,421.1
of which from households (1,000 m^3)	..	..	..	..	..	..	..	..

Demography and Health	2005	2006	2007	2008	2009	2010	2011	2012
Total population (million inhabitants)	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6
Birth rate (per 1,000)	10.5	10.5	10.6	10.9	11.4	11.4	11.0	11.1
Total fertility rate	1.2	1.2	1.3	1.3	1.3	1.3	1.3	1.3
Mortality rate (per 1,000)	12.4	12.0	12.0	11.8	11.8	12.2	11.0	11.1
Infant mortality rate (deaths/1,000 live births)	12.4	11.8	11.3	12.2	12.1	11.7	10.9	9.8
Life expectancy at birth (years)	67.9	68.4	68.8	69.4	69.3	69.1	70.9	71.1
Female life expectancy at birth (years)	71.7	72.2	72.6	73.2	73.4	73.4	74.9	75.0
Male life expectancy at birth (years)	63.8	64.6	65.0	65.6	65.3	65.0	66.8	67.2
Population aged 0-14 years (% of total)	19.0	18.3	18.2	17.6	17.3	16.7	16.4	..
Population ages 15-64 (% of total)	71.1	71.8	71.5	72.1	72.4	73.2	73.6	..
Population ages 65 and above (% of total)	9.9	9.9	10.3	10.3	10.3	10.1	10.0	..
Proportion of population using an improved drinking water source, total (%)	94.0	95.0	95.0	95.0	96.0	96.0	96.0	..
- Urban (%)	99.0	99.0	99.0	99.0	99.0	99.0	99.0	..
- Rural (%)	91.0	92.0	92.0	92.0	93.0	93.0	93.0	..
Population with access to sanitation, total (%)	34.2	43.7	44.6	46.5	49.0	51.9	56.7	..
- Urban (%)	81.4	84.7	84.2	86.2	86.6	88.7	90.7	..
- Rural (%)	6.1	14.2	15.7	17.3	21.5	25.1	31.4	..

Macroeconomic context	2005	2006	2007	2008	2009	2010	2011	2012
GDP								
- change over previous year (%)	7.5	4.8	3.0	7.8	-6.0	7.1	6.8	-0.8
- in prices and PPPs of 2005 (million US$)	8,492.0	8,898.0	9,165.0	9,883.0	9,291.0	9,950.0	10,628.0	10,542.0
Registered unemployment (% of labour force, end of period)	7.3	7.4	5.1	4.0	6.4	7.4	6.7	5.6
Net foreign direct investment (FDI) (million US$)	191.0	259.4	523.9	695.4	138.6	193.9	253.4	..
Net foreign direct investment (FDI) (as % of GDP)	6.4	7.6	12.3	11.7	2.7	3.4	3.9	..
Cumulative FDI (million US$)	898.0	1,157.0	1,681.0	2,376.0	2,515.0	2,709.0	2,962.0	..

Income distribution and poverty	2005	2006	2007	2008	2009	2010	2011	2012
GDP per capita in prices and PPPs of 2005 (US$/capita)	2,362.0	2,482.0	2,562.0	2,768.0	2,606.0	2,793.0	2,985.0	..
Consumer price index (CPI, 2005=100) (% change over the preceding year, annual average)	100.0	112.9	126.6	142.9	142.7	153.2	165.1	172.8
Population below national poverty line								
- Total (%)	29.0	30.2	25.8	26.4	26.3	21.9	17.5	..
- Urban (%)	..	24.8	18.4	15.2	12.6	10.4	7.4	..
- Rural (%)	..	34.1	31.3	34.6	36.3	30.3	25.0	..

Telecommunications	2005	2006	2007	2008	2009	2010	2011	2012
Fixed telephone lines per 100 inhabitants	24.7	27.4	29.4	30.7	31.6	32.5	33.3	34.3
Cellular subscribers per 100 population	28.9	36.6	51.3	66.7	77.3	88.6	101.2	115.9
Personal computer in use per 100 population	9.3	11.4	..	..	..	..	..	..
Internet users per 100 population	14.6	19.6	20.5	23.4	27.5	32.3	38.0	43.4

Education	2005	2006	2007	2008	2009	2010	2011	2012
Literacy rate (%)	..	..	..	..	..	..	..	..
Literacy rates of 15-24 years old, both sexes, percentage	99.5	99.6	99.6	99.6	99.6	99.5	99.5	..

Gender Inequality	2005	2006	2007	2008	2009	2010	2011	2012
Share of women employment in the non-agricultural sector (%)	54.9	53.5	54.6	54.1	54.3	55.0	..	..
Gender Parity Index in								
- Primary education enrolment (ratio)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	..
- Secondary education enrolment (ratio)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	..
- Tertiary education enrolment (ratio)	1.5	1.4	1.4	1.5	1.4	1.3	1.4	..

Source: UNECE, UNFCCC, World Bank, MDG indicators, National Bureau of Statistics of the Republic of Moldova

Annex IV

LIST OF MAJOR ENVIRONMENT-RELATED LEGISLATION

1993

- Law No. 1515-XII on environmental protection

1995

- Law No. 439-XIII on fauna
- Law No. 440-XIII on water conservation zones and strips of rivers and reservoirs
- Law No. 534-XIII on concessions
- Law No. 547-XIII on education

1996

- Law No. 847 on budget system and budget process
- Law No. 851-XIII on ecological expertise and environmental impact assessment

1997

- Law No. 1347-XIII on industrial and domestic waste
- Law No. 1422-XIII on the protection of atmospheric air

1998

- Law No. 1540-XIII on payment for environmental pollution
- Parliamentary Resolution No. 1599-XIII on accession of the Republic of Moldova to the Basel Convention on Control of Transboundary Movement of Hazardous Wastes and their Disposal

2000

- Law No. 982 on access to information
- GD No. 72 on approval of the Regulations on public involvement in development and adoption of environmental decisions

2001

- MO of the Minister of Environment and Spatial Planning No. 67 approving the Master Plan for Construction of Solid Waste Landfills

2002

- Instruction No. 188 on the way of organizing and conducting State ecological expertise

2003

- GD No. 637 on streamlining control of transboundary waste transportation and disposal
- GD No. 1574 creating the National Commission for the implementation and realization of the commitments under the UNFCCC and of the mechanisms and provisions of the Kyoto Protocol

2004

- GD No. 164 on the methodology for the establishment of water supply and sanitation tariffs
- GD No. 862 on improving the system of specialized State control
- MO of the Ministry of Ecology, Construction and Territorial Development No. 21 creating the Climate Change Office

2005

- Law No. 115-XVI on ecological farm production

- Law No. 325-XVI on the Red Data Book of the Republic of Moldova
- GD No. 920 on classification of permits and certificates issued by central administrative authorities and their subordinate bodies to individuals and businesses practising entrepreneurial activities
- GD No. 1030 on the Register of official acts regulating entrepreneurial activity

2006

- Law No. 149-XVI on fishery, fishing and fish farming
- Law No. 231-XVI on the identification and registration of animals
- Law No. 235-XVI on the basic principles of regulation of business activity
- Law No. 422-XVI on general safety of products
- GD No. 149 on the implementation of the 2005 Law No. 115-XVI on ecological farm production
- GD No. 275 on approval of amendments and additions that are made in some government decisions and abrogation of normative acts
- 2006 GD No. 1230 on approval of the methodology of regulatory impact assessment and monitoring the effectiveness of regulatory acts

2007

- Law No. 94-XVI on the national environmental network
- Law No. 160-XVI on renewable energy
- Law No. 239-VVI on plants ("law on vegetal kingdom")
- Law No. 221-XVI on veterinary and sanitary activities
- GD No. 33 on the procedures and rules for the elaboration of policy documents
- GD No. 618 on approval of the list of indicators for each criterion of sustainable management in forests of the Republic of Moldova
- GD No. 1093 on approval of Regulations on procedures and documents concerning the Animal Identification and Traceability System (AITS)
- GD No. 104 approving the strategy for State regulation of entrepreneurial activity reform
- GD No. 958 on Energy Strategy of the Republic of Moldova until 2020

2008

- Code on offences, No. 218
- Law No. 173-XVI on completion of the Law No. 1540-XIII on payment for environmental pollution
- Law No. 179-XVI on public–private partnerships
- Law No. 205-XVI on the acceptance of amendment to the Basel Convention, including Annex VII
- Law No. 239 on transparency of decision making
- GD No. 1017 on approval of the National Registry of Radiation Sources and authorized physical persons and legal entities
- GD No. 1220 on approval of Regulations on State supervisory control and supervision of nuclear and radiological-safety
- GD No. 107 on approval of Regulations on forest rent for hunting management and/or recreation
- GD No. 1078 on approval of the technical regulation "Ecological farm-production and the labeling of ecological agricultural products"
- MO No. 107 of the Ministry of Agriculture and Food Industry approving rules on the registration of businesses operating in ecological farm-production
- GD No. 1157 on approval of the technical regulation on agricultural soils protection
- GD No. 1296 on environmental payments on import of goods which in the process of use cause environmental pollution and on imported plastic and tetra-pak packaging
- MO of the Minister of Agriculture and Food Industry No. 179 approving the regulation on content and filling in of a book of the history of a field

2009

- Law No. 10-XVI on the State supervision of public health
- Law No. 170 on amending and supplementing certain acts
- GD No. 81 on approval of the Regulation on polychlorinated biphenyls

- GD No. 847 on approval of the Regulation regarding the establishment and operation of the Ministry of Environment, its structure and central staff numbers
- GD No. 212 on approval of Regulations on authorization of nuclear and radiological-safety activity
- GD No. 388 on approval of Regulations on the handling of radioactive wastes

2010

- Law No. 142 on energy efficiency
- Law No. 228 on protection of plants and phytosanitary quarantine
- GD No. 384 on the service of State supervision of public health
- MO of the Minister of Environment No. 110 on classifying businesses according to their pollution impact on air quality
- MO of the Minister of Environment No. 87 creating the Interministerial Working Group on Climate Change

2011

- Law No. 161 on implementation of the single window in business activity
- Law No. 272 on water
- GD No. 833 on approval of the National Energy Efficiency Programme for the period 2011–2020

2012

- Law No. 318 amending and supplementing certain acts
- GD No. 289 Action Plan of the Government for 2012–2015
- GD on the establishment of a government commission on the expansion of the area of forest vegetation
- GD No. 401 on approval of Regulations on the organization and functioning of the Energy Efficiency Fund

2013

- GD No. 102 on Energy Strategy until 2030
- GD No. 51 on the organization and activities of the National Agency for Food Safety

SOURCES

Individual authors:

1. Andreev, S. and Bondarenco, A. (2006). Liliecii – fiinţe remarcabile. Biotica, 2006.
2. Bacal, P. (2011). Academy of Economic Studies: The Problems, Achievements and Trends in Waste Management in the Republic of Moldova. 2011.
3. Belinschi, L. (2012) Current status and the perspectives of development of RES in the Republic of Moldova. November 5, 2012.
4. Botnari F., et al. (2011): State of the forestry of the republic of Moldova 2006-2010. Agency Moldsilva. Chisinau. – 60 pp. (International Year of Forests - 2011).
5. Budianschi, D., et al. (2012). Evaluating the efficiency and transparent use of agricultural subsidies. Expert-Group, Chisinau, 2012.
6. Constantin, D. (2013). "Rationalizarea sistemului informational din Republica Moldova in perspectiva integrarii in Uniunea Europeana". PhD thesis –Sttae University of Moldova, 2013. available from http://www.cnaa.md/files/theses/2013/23807/constantin_david_thesis.pdf
7. Corobo, R. (2008): Regional Climate and Environmental Change: Moldova's case study. NATO Advance Workshop: Regional aspects of climate-terrestrial hydrologic interactions (presentation)
8. Galupa, D., et al. (2011). Illegal logging in Moldova: Analytical Study 2010-2011.
9. Gavrilita, P. (2006). Environmental Systems Analysis of Municipal Solid Waste Management in Chisinau, Moldova. 2006.
10. Gromovs, J. (2011). Concept of the New Legal Approximation Mechanism for the Republic of Moldova Project "Building Institutional Capacity of the Ministry of Foreign Affairs and European Integration. Chisinau 2011.
11. Gulca, V. (2006). Opportunity of small-scale forestry in Moldova. In *Small-scale forestry and rural development. The intersection of ecosystems, economics, and society. Proceedings of IUFRO 3.08 Conference. Galway-Mayo Institute of technology, Galway* (pp. 120-134).
12. Gulca, V. (2010). Distrust in private forests – main gap in Sustainable Forest Management of Moldov: *Journal of Horticulture Forestr and Biotechnology*: Vol 4. No1. pp 80-90.
13. Gulca, V., and Deal, R. (2011). Sustainable Forest Management in Moldova: A guiding principle to integrate public and private forestry sectors. *Legal Aspects of European Forest Sustainable Development*, 112- 128.
14. Howard, B., and Gofman, L. (2010). Environmental protection Law and Policy - Law approximation to EU standards in the Republic of Moldova. Chisinau.
15. Howard, B., and Gofman, L. (2010). Legislation and policies on environmental protection. Harmonization of Moldovan legislation to EU standards. Chisinau 2010.
16. Iurcisin, I. (2011). Adding new rules above the old ones - Institutional Change of the Water Sector in Moldova. Lund University. Available from http://www.lunduniversity.lu.se/o.o.i.s?id=24965&postid=1967714.
17. Mija, A. (2010). Tariff methodologies in energy sector. National Agency for Energy Regulation. Chisinau, June 2010. Available from www.narucpartnerships.org/Dcouments/Wed_23_Jun_10_00_Tariff_Methodologies
18. Moody, R., et al. (2010). Agriculture and Food Law and Policy Approximation to EU Standards in the Republic of Moldova. Chisinau, April 2010.
19. Pleshko, T. M. (Environmental Policies and European Integration Division, Ministry of Ecology and Natural Resources,): Identification and description of key environmental and safety problems in the

Republic of Moldova. (no date)

20. Qehaja, D. (2012). Fiscal policy responses to external crises: The case of Moldova 1998-2010. IMF Working Paper WP/12/82, March 2012. Available from www.imf.org/external/pubs/ft/wp/2102/wp1292.pdf

21. Robu, T. (2011). "Supporting nationally-owned Green Economies to achieve the MDGs and respond to climate change" Experience of the Republic of Moldova. Presentation for: Re-orient the agriculture sector towards green growth. Vienna, February 17, 2011.

22. Rodríguez Rodríguez, D. (2009). (Spanish National Research Council (CSIC):Protected Areas of the Republic of Moldova: An updated review: September 2009

23. Schabanova, G.A. (2012). Stepnaja Rastitelnost Respubliki Moldova. Eco-Tiras. Chisisnau

24. Schmieder, U. (2012). Resource Efficiency Gains and Green Growth Perspectives in Moldova. Friedrich Ebert Stiftung, September 2012.

25. Stuart, E. (2010). Law Approximation to EU Standards in the Republic of Moldova. Taxation Law and Policy, Sectoral law approximation guideline series. IBF International Consulting in consortium with DMI, IRZ, Nomisma, INCOM and Institute of Public Policy. Chisinau, March 2010. Available from www.ncu.molodva.md/public/files/publication/armoniuare/TAX_EN.pdf

26. Usatyi, A., et al. (2010). State of Bream Populations in Reconstructed Water Bodies of Moldova. Oradea, 2010.

27. Vasilieva, N. (2010). Regulatory Aspects of Radioactive Waste Management in the Republic Of Moldova, 2010.

28. Vatamaniuc, M. (2012). European neighbourhood and partnership instrument – Shared environmental information system. Republic of Moldova Country Report. Chisinau, January 2012.

29. Willems, S. and Busuioc, C. (2011). Analysis for European Neighbourhood Policy (ENP) Countries and the Russian Federation of social and economic benefits of enhanced environmental protection – Moldova Country Report.

Material from the Republic of Moldova:

30. " Educatia 2020" - Strategia sectoriala de dezvoltare pentru anii 2012-2020 (Proiect). Available from: http://particip.gov.md/public/documente/137/ro_427_Proiectul-Strategiei-Sectoriale-de-Dezvoltare-Educatia-2020.pdf

31. "ProConsulting" SRL (2012). Diagnostic Analysis of ME "Regia Apa Soldanesti" Project Modernization of Local Public Services in the Republic of Moldova. 2012.

32. Acord de colaborare dintre Primăria Municipiului Chişinău şi Consiliul Naţional al ONG-urilor din Republica Moldova, Chisinau 28 March 2011. Available from http://www.google.dk/url?sa=t&rct=j&q=Acord+de+colaborare+dintre+Prim per centC4 per cent83ria+Municipiului+Chi per centC5 per cent9Fin per centC4 per cent83u+ per centC5 per cent9Fi+Consiliul+Na per centC5 per centA3ional+al+ONG+din+Republica+Moldova&source=web&cd=1&ved=0CCcQFjAA&url=http per cent3A per cent2F per cent2Fwww.chisinau.md per cent2Fdownload.php per cent3Ffile per cent3DcHVibGljL3B1YmxpY2F0aW9ucy8zMTQ3NTk5X21kX2Fjb3JkX3ByaW1hcmlhLnBkZg per cent253D per cent253D&ei=uixQUfDDII76sgbpi4HoAQ&usg=AFQjCNHSWmK-Zzqj5adUpuCcVFMtE2X0BQ

33. Acord intre cabinetul de ministry al Ucrainei si Guvernul Republicii Moldova privind colaborarea in domeniul protectiei si dezvoltarii durabile a bazinului riului Dniester, semnat la Roma la 29 noiembrie 2012. Available from http://www.eco-tiras.org/docs/ACOR_DNIESTER_MD_final-UA per cent20final.pdf;

34. Agency Moldsilva with support from ENPI/FLEG programme for Moldova - Raport privind starea sectorului forestier din Republica Moldova – perioada 2006-2010. Available from

http://www.moldsilva.gov.md/public/files/publication/RAPORT.pdf

35. Agreement between the Government of the Republic of Moldova and the Government of Romania for the cooperation for the protection and sustainable use of Prut and Danube waters, Chisinau 28 June 2010.

36. Al Patrulea Raport national cu privire la diversitatea biologica. Chisinau 2009. Available from http://bsapm.moldnet.md/Romana/Noutati/raportul per cent20iv per cent20cbd.pdf

37. Ambasada Republicii Cehe la Chisinau - "Monitoringul hidrologic al apelor de suprafaţă şi protecţia împotriva inundaţiilor în bazinul rîului Prut", Available from http://www.mzv.cz/chisinau/ro/relatiile_dintre/proiecte_de_cooperare_si_dezvoltare/finalizarea_proiectului_moldo_ceh.html

38. ANRE - National Agency for Energy Regulation. Methodology for the determination, approval and application of tariffs for the electricity generated from renewable electric energy and fuel. Available from http://www.wind-works.org/cms/uploads/media/Moldovan_Pricing_Methodology_ANRE-1.pdf

39. Anuarul Inspectiei Ecologice de Stat2011. Chisinau 2012. Available from http://inseco.gov.md/wp-content/uploads/2010/06/Anuarul-IES-2011_R2-1.pdf ,pag.128-158

40. Asociatia "Moldova Apa-Canal" (2012). Indicii financiari si de productie ai activitatii intreprinderilor de alimentare cu apa si canalizare, membre ale Asociatiei "Moldova Apa-Canal" pentru anul 2011. Chisinau.

41. Association "Leova waste management" (2009). Realization of waste management concept with the objective of reducing negative impacts on water quality in the region of Leova in the year 2009.

42. Expeditia Hidrogeologica din Moldova (EHGeoM) (2010). Studierea regimului şi bilanţului apelor subterane, evidenţa de stat şi ţinerea Cadastrului de Stat al Apelor pe teritoriul Republicii Moldova, 2005-2009.

43. Government of Moldova (2007). Program of Water Supply and Sewerage in Communities of the Republic of Moldova until 2015.

44. Government of Moldova and European Union Delegation (2011). Review Mission for Sector Policy Support Programme (SPSP) (Water Budget Support) - Draft Review Report.

45. Methodology for Law Approximation in the Republic of Moldova. Chisinau 2010.

46. Ministerul Mediului, Inspectoratur ecologic de Stat (2012). Anuarul IES - 2011 - "Protectia mediului in Republica Moldova". Chisinau. Available from www.inseco.gov.md/monitorizare.

47. Ministerul Mediului. Program de dezvoltare strategic 2-12-2014, Available from http://ta-water-spsp.eu/wp-content/uploads/2012/02/PROGRAMUL-DE-DEZVOLTARE-STRATEGIC per centC3 per cent83-2012-2014.pdf

48. Ministerul Mediului. Raport privind starea mediului in Moldova 2007-2010.

49. Ministerul Sanatatii si Academia de Stiinte a Republicii Moldova - Sanatatea in relatia cu mediul – Monitorizarea starii de sanatate in relatie cu factorii exogeni, Chisinau, 2010. Available from http://www.cnsp.md/down/info1291853788ro.pdf

50. Ministerul Sanatatii, Centrul National de Sanatate Publica - Supravegherea de stat a sanatatii publice – Raport national 2012.

51. Ministry of Environment (2008). National Profile for Chemicals Management in the Republic of Moldova. Chisinau 2008.

52. Ministry of Environment (2010). Challenges and future prospects in the sustainable management of waste in the Republic of Moldova. Chisinau 2010.

53. Ministry of Environment (2010). National report of parties on the implementation of the convention on the conservation of migratory species of wild animals (CMS). Document prepared for submission to the Tenth Meeting of the Conference of the Parties (COP10) (Norway, 2011).

54. Ministry of Environment (2010). National report on the implementation of the Eurobats agreement in the Republic of Moldova.

55. Ministry of Environment (2012). National Action Plan for Implementing the Programme of Work on Protected Areas of the Convention on Biological Diversity: submitted to CBD Secretariat July 2012.

56. Ministry of Environment (2012). State Development Programme 2012-2014.

57. Ministry of Environment (2012). Strategic Development Programme 2012-2014.

58. Ministry of Environment (2013). National Waste Management Strategy of the Republic of Moldova (2013-2027). 2013.

59. Ministry of Environment and Natural Resources (2008). Environmental Protection in the Republic of Moldova.

60. Ministry of Environment and UNEP (2004): National biosafety framework. Project report of UNEP/GEF Project: "Development of the National Biosafety Framework for the Republic of Moldova".

61. Ministry of Environment, State Ecological Inspectorate (2012). Yearbook 2011 - Environmental protection in the Republic of Moldova. Chisinau 2012.

62. Ministry of Environment. "Main activities of the Republic of Moldova for celebrating the "UN Decade on Biodiversity, 2011-2020". Available from http://www.cbd.int/2011-2020/country/?country=md assessed 07/03/2013

63. Ministry of Environment. Strategic Development Plan 2012-1014.

64. National Agency for Regulation of Nuclear and Radiological Activities (2012). 1st National Report under the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management. February 2012.

65. National Bureau of Statistics of the Republic of Moldova (2011). Statistical Yearbook of the Republic of Moldova 2011. Chisinau.

66. National Bureau of Statistics of the Republic of Moldova (2012). Statistical Yearbook of the Republic of Moldova 2012. Chisinau.

67. National Bureau of Statistics of the Republic of Moldova: Natural Resources and Environment in the Republic of Moldova, 2010, 2011 and 2012.

68. Raport National de dezvoltare umana 2009-2010, Climate change in Republic of Moldova. Chisinau 2009. Available from http://www.undp.md/publications/2009NHDR/Raport_var_ROM_final_TIPAR_03-12-2009_1.pdf

69. REC Moldova (2011). Europe's environment – An Assessment of Assessments Eastern Europe. Available from http://www.eea.europa.eu/themes/regions/pan-european/sub-regional-assessment-of-assessment-reports/rec-reports

70. Regional Environmental Center for Central and Eastern Europe (2012). Moldova Environmental Civil Society Assessment. August 2012.

71. Report from Countries of Central and Eastern Europe to the 40th Meeting of the CMS Standing Committee (based on contributions from Republic of Armenia, Georgia, Republic of Moldova and Ukraine) Regional activities for the implementation of the Convention on Migratory Species and its related instruments Period from last to present meeting of the CMS Standing Committee (November 2011 – October 2012).

72. Republic of Moldova (2002). Technology Needs Assessment and Development Priorities. Chisinau.

73. Republic of Moldova (2002). Thematic report on alien species to CBD

74. Republic of Moldova (2004). National Implementation Plan for the Stockholm Convention on

Persistent Organic Pollutants 2004.

75. Republic of Moldova (2005). National Planning Tool for the Implementation of the Ramsar Convention on Wetlands Moldova 2005.

76. Republic of Moldova (2005). Third National Report on the implementation of the Convention on Biological Diversity. December 2005.

77. Republic of Moldova (2005). United Nations Development Assistance Framework 2007-2011. Chisinau 2005.

78. Republic of Moldova (2008). National Planning Tool for the Implementation of the Ramsar Convention on Wetlands Moldova 2008.

79. Republic of Moldova (2008). Public Expenditure and Financial Accountability Assessment, Public Financial Management Performance Report, July 2008. Available from www.mf.gov.md/common/raportinfo/evaluare/PEFA_Moldova_2008_final.pdf

80. Republic of Moldova (2009). Activity Program of the Government "European Integration: Freedom, Democracy, Welfare" 2009-2013. Chisinau, 2009.

81. Republic of Moldova (2009). Fourth National Report on Biological Diversity. Chisinau, December 2009.

82. Republic of Moldova (2010). Children health and the environment in Republic of Moldova. Chisinau 2010. Available from http://www.cnsp.md/down/info1291935746ro.pdf

83. Republic of Moldova (2010). Climate Change and Agriculture Country Note. November 2010.

84. Republic of Moldova (2010). Partnership Principles Implementation Plan. 30 November 2010.

85. Republic of Moldova (2010). Rethink Moldova: Priorities for Medium-term Development. Chisinau 2010. Available from http://www.gov.md/doc.php?l=en&id=2774&idc=447

86. Republic of Moldova (2010). Second Millennium Development Goals Report, September, 2010.

87. Republic of Moldova (2011). Activity Program of the Government "European Integration: Freedom, Democracy, Welfare" 2011-2014. Chisinau, 2011.

88. Republic of Moldova (2011). Low Emissions Development Strategy of the Republic of Moldova to the year 2020. Chisinau 2011.

89. Republic of Moldova (2011). National Human Development Report 2010-2011. Chisinau 2011.

90. Republic of Moldova (2011). Public Expenditure and Financial Acountability Assessment, Public Financial Management Performance Report, October 2011. Available from http://ec.europa.eu/europaid/what/economic-support/public-finance/pefa- assessment_en_htm

91. Republic of Moldova (2011). Setting Targets and Target Dates under the protocol on Water and Health in the Republic of Moldova, Chisinau 2011.

92. Republic of Moldova (2011). State of the environment in the Republic of Moldova 2007-2010. 2011. Available from http://ies.gov.md/file/rapoarte/SM_eng.pdf.

93. Republic of Moldova (2012). Action Plan for Implementing the Programme of Work on Protected Areas of the Convention on Biological Diversity Republic of Moldova Submitted to the Secretariat of the Convention on Biological Diversity: 5 July 2012.

94. Republic of Moldova (2012). National Climate Change Adaptation Strategy of the Republic of Moldova. Chisinau 2012.

95. Republic of Moldova (2012). National Planning Tool for the Implementation of the Ramsar Convention on Wetlands Moldova 2012.

96. Republic of Moldova (2013). Low Emissions Development Strategy of the Republic of Moldova. Draft February 2013 version.

97. Republic of Moldova and Donors (2006). A development partnership framework. Co-ordination and harmonization of government and donor practices for aid effectiveness in the Republic of

Moldova. May 2006.

98. Republic of Moldova and UNDP (2012). National Report for UN CSD 2012 Rio+20. Chisinau, 2012. Available from http://www.mediu.gov.md/images/Report_RIO20_ENG_12-06-2012_NEW_OUT.pdf

99. Republic of Moldova and United Nations Moldova. Towards Unity in Action. United Nations – Republic of Moldova Partnership Framework 2013 – 2017. (no publishing date)

100. Republic of Moldova and United Nations. National Strategy for Sustainable Development. Chisinau. (no date)

101. Republic of Moldova. Biennial report 2007 – 2008 biennial report Convention on International Trade in Endangered Species of Wild Fauna and Flora.

102. Republic of Moldova. Development Partnerships Principles Coordination and Harmonisation of Government and Partner Practices for Enhanced Effectiveness of Foreign Assistance to the Republic of Moldova 2010.

103. Republic of Moldova. Draft National Adaptation Strategy of the Republic of Moldova. February 2013 version.

104. Republic of Moldova. Hydrochlorofluorocarbon Phase-out Management Plan (HPMP) Lead Implementing Agency: UNDP National Executing Agency: Ministry of Environment, National Ozone Unit Chişinău, December 2010 Revised March 2011.

105. Republic of Moldova. Ministry of Finance, Taxation in Moldova 2008. Available from www.mf.gov.md/common/taxation/Text_2.doc

106. Republic of Moldova. Moldova 2020, National Development Strategy: 7 Solutions for Economic Growth and Poverty Reduction.

107. Republic of Moldova. Position Paper United Nations in Moldova with Development Partners: National Development Strategy 28 June 2011.

108. Republic of Moldova. Strategic Development Programmes in Moldova. Status on 06 February 2013 Support to the State Chancellery – TTSIB EC project. Available from www.ncu.moldova.md

109. Republic of Moldova. Trip report Implementing National Wetlands Policy in the Republic of Moldova. Chisinau, Moldova 5th – 7th December 2012. Available from http://www.ramsar.org/pdf/sgf/MoldovaSGFReport_FINAL.pdf

110. Republica Moldova (2011). Raport privind activitatea Serviciului Piscicol pentru 2011. Chisinau 2012.

111. Resursele naturale si mediul in Republica Moldova. Available from http://www.statistica.md/pageview.php?l=ro&idc=350&id=3242

112. Strategic Approach to International Chemicals Management: National Profile for Chemicals Management in the Republic of Moldova 2008.

113. Second National Communication (2009). National Inventory Report: Greenhouse Gas Sources and Sinks in the Republic of Moldova 1990-2005.

114. Summary of the proposed measures according to ECE Water and Health protocol, 2011. Available from http://ta-water-spsp.eu/wp-content/uploads/2012/02/Anexa-4-Rezumat-privind-masurile-propuse-conform-Protocolului-Apa-si-Sanatate-20111.pdf

115. Technical Assistance for the Implementation of Sector Policy Support Programme in the Water Sector (2011). Inception Report (Draft). Chisinau. Available from http://ta-water-spsp.eu/en/studii-ateliere-si-formare-profesionala/rapoarte-administrative/.

116. Technical Assistance for the Implementation of Sector Policy Support Programme in the Water Sector (2012). Technical Report No. 19 (TR19-C4) Republic of Moldova's Water & Sanitation Strategy (Revised Version 2012) - 2nd Draft. Chisinau. Available from http://ta-water-

spsp.eu/en/studii-ateliere-si-formare-profesionala/rapoarte-tehnice/.

117. Zoi Environment and United Nations Development Programm (2012). Environmental Atlas - Dniester River Basin. Available from www.grida.no/publications/dniester-river-atlas.

118. Zoi Environment Network, European Environment Agency (2012). Republic of Moldova Country Report. Chisinau. Available from www.eea.europa.eu/themes/regions/pan-european/virtual-library/country-fiches/Republic-of-Moldova-Green-economy.

Regional and international institutions:

119. Air Quality Governance in ENPI East Countries- GENERAL SYSTEM GAP ANALYSIS, 2012 update. Available from http://www.airgovernance.eu/admin/editor/uploads/files/Final per cent20Report per cent20- per cent20 per cent20GAP per cent202012 per cent20update per cent20EN.pdf

120. Austrian Development Cooperation (2010). Moldova Country Strategy 2011-2015. December 2010. Reprint July 2012. Available from www.entwicklung.at/uploads/media/CS_Moldova_2011-2015.pdf

121. Basel Convention (2009). Country Fact Sheet Republic of Moldova, 2009.

122. Basel Convention classification of parties' individual compliance performance with regard to the annual reporting obligation (11 December 2012)

123. Convention on the Conservation of European Wildlife and Natural Habitats. Standing Committee 32nd meeting Strasbourg, 27-30 November 2012 Proposed navigable waterway in the Bystroe Estuary (Danube delta) (Ukraine) Report by the Republic of Moldova on the situation regarding the implementation of the provisions included in recommendation no. 111 (2004) on the proposed navigable waterway through the Bystroe estuary (Danube delta, Ukraine), adopted by the standing committee of the Bern convention on 3 December 2004

124. Convention on the Conservation of Migratory Species of Wild Animals (2011). Moldova report 2010.

125. Council of Europe: European landscape convention 5th conference of the council of Europe on the European landscape convention Council of Europe Presentation of the Landscape Policies in the Member States of the Council of Europe. 30-31 March 2009.

126. Czech Republic development cooperation programme. Republic of Moldova 2011-2017.

127. EBRD (2012). Country Assessments Transition Report 2012 – Moldova. Available from www.ebrrd.com/downloads/research/transition/assessments/Moldova.pdf

128. EBRD. Moldova Country Profile

129. ECE and Swiss Agency for Development and cooperation - Republic of Moldova: Stabilirea tintelor si indicatorilor-tinta in corespundere cu P rotocolul privind apa si sanatatea in Republica Moldova, Chisinau 2011. Available from http://www.cnsp.md/down/info1317740293ro.pdf

130. Economist Intelligence Unit (2013). Moldova Country Report. Generated 3 February 2013.

131. Eco-Tiras (2011). Yagorlyk Nature Reserve: Plan of Reconstruction and Management as a way to Biodiversity Preservation.

132. ENPI FLEG Report (2012): Improving Forest Legislation in the Republic of Moldova. 2012

133. ENPI-FLEG (2010). Moldovan Forests: Reality, Problems, Solutions. May, 2010.

134. ENPI-FLEG (2011). Moldovan Forests: Wood Harvesting and Consumption. May, 2011

135. ENPI-FLEG (Draft version as of 2009). Country work plan for the Republic of Moldova.

136. Eptisa led Consortium: Waste Governance – ENPI East TR 5 (Waste and Contaminated Site Inventory

& Action Plan) 31 May 2012.

137. Eptisa led Consortium: Waste Governance – ENPI East WP 12 (Strategy Frameworks for the Pilot Region), 30 November 2010.

138. Eptisa led Consortium: Waste Governance – ENPI East WP 4 (Register of Waste Disposal), 31 May 2011.

139. Eptisa led Consortium: Waste Governance – ENPI East WP 5 (Assessment of Existing Waste Management Situation), 28 February 2011.

140. Eptisa. Technical Assistance for the Implementation of Sector Policy Support Programme in the Water Sector (TA Water SPSP – EuropeAid/130872/C/SER/MD Contract 201/270-593): Technical Report No. 15 (TR15-C3) Report on the fiscal assessment of the viability of the WSS strategy. 20 September 2012. Available from http://ta-water-spsp.eu/wp-content/uploads/2012/02/Technical-Report-No-15-TR15-C3

141. European Bank for Reconstruction and Development EBRD (2010). Strategy for Moldova 2010 – 2013 As approved by the Board of Directors at its meeting on 14 December 2010.

142. European Commission (2008). Convergence with EU Air Protection Policies. Short guide for ENP Partners and Russia. January 2008. (Author: Ruth Landgrebe). Available from www.ec.europa/environment/enlarg/padf/pubs/air_en.pdf

143. European Commission (2011). Opportunities and options for promoting a Green Economy in the Eastern Partnership Countries. Final report. EuropeAid/127054/C/SER/Multi. June 2011.

144. European Commission (2012). Implementation of the European Neighbourhood Policy in the Republic of Moldova. Progress in 2011 and recommendations for action. Brussels, 15.5.2012.SWD (2012) 118 final. Available from http://ec.europa.eu/world/enp/docs/2012_enp_pack/progress_report_moldova_en.pdf

145. European Commission, Directorate-General Taxation and Customs Union (2013). Excise Duty Tables, Part II – Energy products and Electricity. REF 1036. January 2013.

146. European Commission. Brussels, 3.8.2012 C(2012) 5518 Implementing Decision of 3.8.2012 on the Annual Action Programme 2012 in favour of the Republic of Moldova to be financed under Article 19 08 01 03 of the general budget of the European Union.

147. European Commission. European Neighbourhood and Partnership Instrument. Republic of Moldova, Country Strategy Paper 2007-2013. Available from www.ec.europa.eu/worold/enp/pdf/country/enpi_csp_Moldova_en.pdf.

148. European Commission. External Relations Directorate-General: European Neighbourhood and Partnership Instrument Republic of Moldova National Indicative Programme 2011-2013.

149. European Commission. High Representative of The European Union for Foreign Affairs and Security Policy Brussels, 15.5.2012 Joint (2012) 13 Final Joint Communication to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions Eastern Partnership: A Roadmap to the autumn 2013 Summit.

150. European Commission. Implementation of the European Neighbourhood Policy in the Republic of Moldova Progress in 2011 promoting a Green Economy in the Eastern Partnership.

151. European Commission. Implementing Decision Of 13/07/2011 On the Annual Action Programme 2011 in favour of the Republic of Moldova to be financed under Article 19 08 01 03 of the general budget of the European Union.

152. European Union (2012). Directive 2012/18/EU of the European Parliament and of the Council of 4 July 2012 on the Control of Major-Accident Hazards Involving Dangerous Substances, Amending and Subsequently Repealing Council Directive 96/82/EC.

153. European Union (2012). Implementation of the European Neighborhood Policy in the Republic of Moldova Progress in 2011 and Recommendations for Action. Brussels, 15.5.2012.SWD (2012) 118 final.

154. European Union. Comprehensive Institutional Building Programme 2011-2013 for the Republic of Moldova. (no date)

155. European Union. United Nations Development Programme Project document EU High Level Policy Advice Mission (EU HLPAM).

156. Eurostat (2012). Taxation trends in the European Union. 2012 edition.

157. FAO (2010). Global forest resources assessment 2010: country report: Republic of Moldova.

158. Forest Europe, UNECE and FAO (2011). State of Europe's Forests 2011. Status and Trends in Sustainable Forest Management in Europe.

159. Framework Document. EU Eastern Partnership, 2011.

160. Global Environment Fund GEF (2009). Country Portfolio Evaluation: Moldova (1994–2009). September 2010.

161. Good Environmental Governance in Eastern Partnership Countries: "Close, but no cigar" Policy Brief, Civic Expert Council, UNENGO "MAMA-86" Kyiv 2011.

162. IISD (2012). Procurement, Innovation and Green Growth: the story continues. 2012. Available from http://www.iisd.org/pdf/2012/procurement_innovation_green_growth_continues.pdf

163. Infrastructure for Spatial Information in the European Community – the EU Directive on INSPIRE entered into force in 2007. Available from http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:32007L0002:EN:NOT

164. International Commission for the Protection of the Danube River: Danube River Basin District Management Plan 2009 ICPDR Interim Report on the Implementation of the Joint Program of Measures in the DRBD 2012 ICPDR.

165. International Development Association and IMF (2008). Republic of Moldova, Debt Sustainability Analysis, February 20, 2008. Available from www.imf.org/external/pubs/ft/dsa/pdf/dsacr08139.pdf

166. International Finance Corporation (2012). Organic agriculture in Moldova: local and regional perspectives. 2012.

167. International Fund for Agricultural Development IFAD. Republic Of Moldova Rural Financial Services and Agribusiness Development Project (RFSADP). Project Final Design Report. (no date)

168. International Monetary Fund IMF (2008). Republic of Moldova. Poverty Reduction Strategy Paper—National Development Strategy Report for 2008-2011. IMF Country Report No. 08/143. April 2008.

169. International Monetary Fund IMF (2011). Republic of Moldova: Poverty Reduction Strategy Paper Progress Report 2011.

170. International Monetary Fund IMF (2012). Country Report October 2012.

171. International Monetary Fund IMF and Republic of Moldova (2012). Letter of Intent, Memorandum of Economic and Financial Policies, and Technical Memorandum of Understanding. January 12, 2012

172. Joint Programme funded by the European Union and implemented by the Council of Europe support for the implementation of the Convention on Biological Diversity programme of work on protected areas in the EU Neighbourhood policy East area and Russia: extension of the Implementation of the EU's Natura 2000 principles through the emerald network second progress report dci-env/2008/149-825. Available from http://www.coe.int/t/dg4/cultureheritage/nature/EcoNetworks/JP/Documents/Progress_Report_2.pdf

173. Millennium Challenge Corporation - Irrigation Sector Reform Services project in Moldova, Moldova (2010-2015). Available from http://www.aht-group.com/index.php?id=621

174. Moldova Country Report - BTI 2012. Bertelsmann Stiftung, Gutersloh 2012.

175. Multilateral Fund for the Implementation of the Montreal Protocol MLF. Phase-out Plans and Projects (As at April 2010) - the multilateral fund secretariat

176. Organisation for Economic Co-Operation and Development OECD (2010). Capacity development for environmental management in Moldova: Drivers, links to planning and methods of assessment. Paris 2010. Available from www.oecd.org/countries/Moldova/45559222.pdf

177. Organisation for Economic Co-Operation and Development OECD (2010). Supporting the Development of an Investment/Action Plan to Help Implement the New Strategy of the Government of Moldova for Water Supply and Sanitation. October 2010. OECD Contract No. M08/135. Available from www.apelemolodvei.org/images/ACTION_PLAN_MD_October2010_EN

178. Organisation for Economic Co-Operation and Development OECD (2010). OECD/EAP Task Force Role in Promoting Green Growth in EECCA: Scoping Report. ENV/EPOC/EAP (2010)3. October 2010.

179. Organisation for Economic Co-Operation and Development OECD (2010). Capacity Development for Environmental Management in Moldova: Drivers, links to planning and methods of assessment 2010.

180. Organisation for Economic Co-Operation and Development OECD and DEPA/DANCEE (2001). Municipal water and wastewater sector in Moldova. Environmental Financing Strategy. Submitted to the Government of the Republic of Moldova. Paris 2001. Available from www.oecd.org/env/environmentinemergingandtransitioneconomies

181. Organisation for Economic Co-Operation and Development OECD EAP Task Force (2010). Capacity Development for Environmental Management in Moldova: Drivers, links to planning and methods of assessment. 2010.

182. Organisation for Economic Co-Operation and Development OECD, EUWI, and DFID (2008). Facilitating policy dialogue and Developing a National Financing Strategy for Urban and Rural Water Supply and Sanitation in Moldova, Final Report. February 2008. Available from http://www.apelemoldovei.org/images/POL_ENG_2008_OECD_EUWI_DFID_water_sector_financing_strategy_main_report.pdf

183. Organisation for Economic Co-Operation and Development OECD/EAP Task Force (2007). Proposed system of surface water quality standards for Moldova: Technical Report, 2007. Available from http://www.oecd.org/env/outreach/38205453.pdf

184. Organisation for Economic Cooperation and Development OECE (2010). Action Plan 2010-2015 - For the implementation of strategic documents and policies in the water supply and sanitation sector in the Republic of Moldova - Draft 29.10.2010. Available from http://www.apelemoldovei.org/oecdeuwiproject.html.

185. Organisation for Security and Co-operation in Europe OSCE (2009). Organisation for Aarhus Centres Guidelines November 2009. A reference document to provide guidance for the strategic orientation, setup and activities of the OSCE supported Aarhus Centres. Available from www.osce.org/eea/40506.

186. Organisation for Security and Co-operation in Europe OSCE ODIHR (2008). Preliminary Report on the Legislative Process in Moldova. September, 2008.

187. Paris Declaration on Aid Effectiveness, Ownership, Harmonisation, Alignment, Results and Mutual Accountability high-level forum Paris 28 February - 2 March 2005.

188. Republic of Moldova (2012). European Neighbourhood and Partnership Instrument – Shared environmental information system. Republic of Moldova Country Report. January 2012.

189. Rotterdam Convention. Secretariat Progress report no. 3 Progress made towards the implementation of COP-4 mandated activities (July 2010 – December 2010).

190. SLE (2011). Bridging the Gap - Participatory District Development Planning in the Water Supply and Sanitation Sector of the Republic of Moldova. Berlin. Available from http://www.sle-

berlin.de/files/sle/auslandsprojekte/2011/S247_Moldau_executive_summary_dt.pdf.

191. Stockholm Convention. Regional Awareness Raising Workshop on New POPs, the Process for Reviewing and Updating NIPs and Reporting Requirements under the Stockholm Convention Brno, Czech Republic 15-18 June 2010.

192. Swiss Agency for Development and Cooperation (SDC) (2011). Moldovan Water Supply and Sanitation Services – in Focus. 13. 12. 2011. Available from www.swiss-cooperation.admin.ch/moldova/en/Home/News_Detail?item/D=207042

193. United Nations (2011). Country Analysis– Moldova. June 2011.

194. United Nations (2012). Towards Unity in Action. United Nations – Republic of Moldova Partnership Framework 2013 – 2017.

195. United Nations and the European Union (2011). Partnership for Moldova, Partnership for Development, 2005-2011. Chisinau 2011.

196. United Nations and the European Union: Partnership for Moldova, Partnership for Development, 2005-2011. Chisinau, 2011.

197. United Nations Convention to Combat Desertification. Performance Review and Assessment of Implementation System 4th Reporting and Review Cycle – 2010 and 2012 Report for Republic of Moldova.

198. United Nations Development Programme Moldova UNDP (2012). The National Situational Report (NSR) on Sound Management of Chemicals (SMC) 2012.

199. United Nations Development Programme UNDP (2009). National Human Development Report 2009/2010. Climate Change in Moldova Socio-Economic Impact and Policy Options for Adaptation. 2009. Available from http://www.undp.md/publications/2009NHDR/NHDR_eng_full.pdf

200. United Nations Development Programme UNDP (2012). Republic of Moldova. From Social Exclusion Towards Inclusive Human Development Republic of Moldova: Assessment of Development Results. Evaluation of UNDP Contribution.

201. United Nations Development Programme UNDP in Europe and Central Asia, chemicals. Available from http://europeandcis.undp.org/ourwork/environment/show/A6E768F4-F203-1EE9-B280882733808D99

202. United Nations Development Programme UNDP in Europe and Central Asia, Low emission development strategies. Available from http://europeandcis.undp.org/ourwork/environment/show/787635D9-F203-1EE9-B827C982696DD06F

203. United Nations Development Programme UNDP/GEF PA Project (2011): Consultant report: Viktor Zubarev: Financing Plan for the Government protected area agencies.

204. United Nations Economic Commission for Europe UNECE (2005). Environmental Performance Review. 2nd Review. United Nations, New York and Geneva, 2005.

205. United Nations Economic Commission for Europe UNECE (2005). Environmental Performance Review. 2nd Review. United Nations, New York and Geneva, 2005.

206. United Nations Economic Commission for Europe UNECE (2009). Republic of Moldova: National energy policy information for regional analysis. Submitted by Climate Change Office under the Ministry of Environment. UNECE Energy Efficiency 21 Programme. September 2009. Available from www.clima.md/public/102/en/EnergyPolicyInformationforRegionalAnalysis

207. United Nations Economic Commission for Europe UNECE (2010). Country Profile Republic of Moldova. Brussels.

208. United Nations Economic Commission for Europe UNECE (2011). Increasing Energy Efficiency to Secure Energy Supplies in the CIS region. Moscow. Available from www.unece.org/fileadmin/DAM/energy/se/pdfs/eneff/publ/FinalReport_e.pdf.

209. United Nations Economic Commission for Europe UNECE. Meeting of the Parties to the

Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters National Implementation Reports Republic of Moldova 2008.

210. United Nations Economic Commission for Europe UNECE. Meeting of the Parties to the Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters National Implementation Reports Republic of Moldova 2011.

211. United Nations Economic Commission for Europe UNECE. Meeting of the Parties to the Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters Fourth session Chisinau, 29 June–1 July 2011 Excerpt from the addendum to the report of the fourth session of the Meeting of the Parties (ECE/MP.PP/2011/2/Add.1) Decision IV/9d on compliance by the Republic of Moldova with its obligations under the Convention.

212. United Nations Economic Commission for Europe UNECE: Consultation meeting on the priorities for implementation of the ENPI Shared Environment Information System (SEIS) project. Country Profiles - Republic of Moldova, 11-12 November 2010.

213. United Nations Economic Commission for Europe UNECEE and Office of the Co-ordinator of OSCE Economic and Environmental Activities (2005). Transboundary Diagnostic Study for the Dniester River Basin. Available from www.osce.org/eea/38320.

214. United Nations Environment Programme UNEP (2009). Second National Communication of the Republic of Moldova Chisinau, 2009 under the United Nations Framework Convention on Climate Change.

215. United Nations Environment Programme UNEP (2011). Organic Agriculture: A step towards the Green Economy in the Eastern Europe, Caucasus and Central Asia region. Case studies from Armenia, Moldova and Ukraine. UNEP 2011.

216. United Nations Moldova. Development of Assistance Framework 2007-2012. Progress Report 2011.

217. United Nations Moldova. Evaluation Report United Nations Development Assistance Framework – Moldova June 2011.

218. United Nations Office of the Resident Coordinator in Moldova. Resident Coordinator Annual Report Moldova 2006.

219. United Nations Office of the Resident Coordinator in Moldova. Resident Coordinator Annual Report Moldova 2007.

220. USAID (2008). Organization of water users for irrigation purposes. Informational Guide. Chisinau 2008.

221. Water governance in the Western EECCA countries, draft report December 2008 under TACIS/2008/137-153 (EC) Available from http://www.wgw.org.ua/publications/Water per cent20Quality per cent20Standards per cent20Assessment per cent20& per cent20Objectives.pdf

222. World Bank (2007). Integrating Environment into Agriculture and Forestry Progress and Prospects in Eastern Europe and Central Asia, Volume II, Moldova Country Review. November 2007.

223. World Bank (2007). Integrating Environment into Agriculture and Forestry. Progress and Prospects in Eastern Europe and Central Asia. Volume II, Moldova – Country Review, November 2007. Available from www worldbank.org/eca/environmentintegration

224. World Bank (2007). Moldova Country Review 2007, Volume II of the Study: 'Integrating Environment into Agriculture and Forestry: Progress and Prospects in Eastern Europe and Central Asia'. Available from www.worldbank.org/eca/environmentintegration

225. World Bank (2009). Republic of Moldova Policy Note: Action Plan for the Financial Stabilization of the District Heating Sector in Chisinau. September 2009.

226. World Bank and GEF (2005). Renewable Energy from Agricultural Wastes, Medium-sized Project proposal Request for GEF Funding. April, 19, 2005.

227. World Bank. Agriculture and Rural Development Department and Europe and Central Asia Region. Moldova Managing Food Safety and Agricultural Health: an Action Plan. (no date)

228. World Health Organization WHO (2004). Health-Care Waste Management Situation Analysis & National Action Plan. January 2004.

Websites:

229. Biroul National de Statistica al Moldovei – Cooperare international
http://www.statistica.md/pageview.php?l=ro&idc=289&

230. Cadastrul de Stat al Apelor din Republica Moldova
http://www.meteo.md/hidro/dh_spravochniki.htm#kadastr

231. Chemarea padurii- Moldsilva 2012
http://www.moldsilva.gov.md/public/files/Chemarea_padurii_.pdf

232. Consiliul National pentru Participare
http://www.cnp.md/ro/despre-cnp/organigrama/12

233. EBRD. Moldova – Water utilities development programme.
www.ebrd.com/pages(project/psd/2010/40267.shtml

234. ECE Joint Task Force on Environmental indicators
http://www.ECE.org/env/europe/monitoring/iandr_en.html

235. Energy and Environmental Technology
http://www.eucredo.info/

236. European Environmental Agency EEA. European Neighbourhood Instrument/ Shared Environmental Information System (ENPI/SEIS) project
http://enpi-seis.ew.eea.europa.eu/

237. GEF. Moldova and the GEF.
www.thegef.org/gef/sites/thegef.org/files/publication/Moldova.pdf

238. Global Partnership for Education
http://www.globalpartnership.org/media/library/FactSheet_Moldova&ECD_August2010.pdf

239. Guvernul Republicii Moldova. Moldova 2020 – Strategia nationala pentru dezvoltare : 7 Solutii pentru cresterea economica si reducerea saraciei
http://www.gov.md/doc.php?l=ro&idc=447&id=5990

240. Guvernul Republicii Moldova. Programul de activitate al Guvernului Republicii Moldova Integrarea Europeană: LIBERTATE, DEMOCRAȚIE, BUNĂSTARE 2011-2014,
http://www.gov.md/doc.php?l=ro&idc=445&id=3729

241. info on Doctoral Programme
http://www.uasm.md/en/summary-of-the-credo-project,

242. Innovative manufacturing engineering international conference
http://www.imane.ro/organizers/tcm-department-of-chisinau-moldova/

243. Inspectoratul Ecologic de Stat - Ecologic Education
http://inseco.gov.md/educatie-ecologica/

244. IUCN
http://www.iucnredlist.org/

245. Legislation of the Republic of Moldova
http://lex.justice.md/

246. List of bilateral agreements signed under the auspices of the ministry of the environment

http://www.mediu.gov.md/index.php/component/content/article/109-categorii-in-romana/acte-normative/tratate-internationale/acorduri-de-colaborare/352-acorduri-de-colaborare

247. Lista părţilor interesate de procesul legislativ sistematizată pe domenii de activitate ale Comisiilor parlamentare permanente ale Parlamentului Republicii Moldova – UNDP project, last update July 2010
http://www.parlament.md/SOCIETATEACIVILA/Organizaţiialesocietăţiicivile/tabid/60/Default.aspx

248. Lista rosie a speciilor de flora si fauna salbatica din zona de granita Romania = Republica Moldova, Iasi 2008
http://biodiversitatecbc-apmis.ro/new/down/lista per cent20rosie/APM_BOOK_ListaRosie_ART_coperta.pdf

249. Millenium Development Goals in the Republic of Moldova
http://www.un.md/mdg/

250. Ministry of Agriculture
http://www.maia.gov.md

251. Ministry of Economy
http://www.mec.gov.md/

252. Ministry of Education – Educational platform for teachers and students
http://www.edu.md/ro/evenimentele-saptaminii/suport-didactic-online-pentru-profesori--i-elevi-136

253. Ministry of Education – High level education in Moldova
http://edu.md/ro/invatamint-superior-ciclul-i-si-ii-/

254. Ministry of Education
http://www.edu.md/ro/anunturi/anunt--14218/

255. Ministry of Environment – National Reports
http://ies.gov.md/md/rap_nat/

256. Ministry of Environment – State Ecological Inspection: Ecological hour dedicated to the European Mobility 2012
http://inseco.gov.md/wp-content/uploads/2010/06/Oră-Ecologică-SME.docx-1.pdf

257. Ministry of Environment Biosecurity Office
http://www.biosafety.md

258. Ministry of Environment Carbon Finance Office
http://www.cfu.md

259. Ministry of Environment Climate Change Office
http://www.clima.md

260. Ministry of Environment Moldova – Reports of subordinated institutions
http://www.mediu.gov.md/index.php/en/about-ministry/hystory?id=401:rapoartele-istitutiilor-subordonate&catid=129:institutiile-subordonate

261. Ministry of Environment Ozone Office
http://www.ozon.md

262. Ministry of Environment POPs Office
http://www.moldovapops.md

263. Ministry of Environment. Ecology Olympics 2013
http://www.mediu.gov.md/index.php/serviciul-de-presa/noutati/1245-tineri-pasionati-de-problemele-mediului-s-au-intalnit-la-olimpiada-republicana-de-ecologie

264. Ministry of Transport and Road Infrastructure
http://www.mtid.gov.md/

265. Miscarea Ecologista din Moldova, publicatii

http://mem.md/index.php/en/2012-03-19-14-33-02

266. Moldova State University. Environment related disciplines
http://usm.md/studii/facultati/facultatea-de-biologie-si-pedologie/

267. National Statistical bureau
http://www.statistica.md/public/files/publicatii_electronice/Educatia/Education08_09.pdf

268. Padurea – o sansa pentru viitor, Moldsilva 2012
http://www.moldsilva.gov.md/public/files/Padurea_o_sansa_pentru_viitor_2012_RO.pdf

269. Parlamentul Republicii Moldova
http://www.parlament.md/SOCIETATEACIVILA/Cadrullegal/tabid/111/Default.aspx

270. Portalul Datelor deschise - Ministerul Mediului
http://data.gov.md/raw/category/177

271. Power Engineering Institute (ENIN). Hydroproject Institute, Renewable Energy Country Profile Version 0.6b
www.ebrdrenewables.com/sites/renew/default.aspx.

272. Press release MoE, 7 February 2013
http://www.mediu.gov.md/index.php/serviciul-de-presa/noutati/1206-ministrul-mediului-gheorghe-salaru-proiectul-managementul-dezastrelor-si-riscurilor-climatice-in-moldova-este-foarte-important-pentru-consolidarea-capacitatilor-tarii-in-prevenirea-si-reducerea-impactului-situatiilor-climatice-nefavorabile

273. Pro Didactica Center- Training for teachers
http://www.prodidactica.md/services.php3

274. Proiectul Abilitarea socio-economica a tineretului
http://paset.wordpress.com/

275. Publication section of the Ministry of Environment
http://www.mediu.gov.md/index.php/component/content/article/113-categorii-in-romana/publicatii/357-publicatii

276. Reports on Environmental Protection in the Republic Moldova in 2009-2012. State Ecological Inspectorate
www.inseco.gov.md

277. Republic of Moldova legislation
http://lex.justice.md

278. Republic of Moldova. Ministry of Environment transboundary cooperation.
http://www.mediu.gov.md/index.php/activitate/cooperare-transfrontaliera

279. Revista Apelor, no.10 din 2010 at: http://ies.gov.md/file/publicati/Revista per cent20Apelor/RA_10_ROM.pdf

280. See: http://www.rural.md/Publicatii.htm

281. State Chancellery Department of Coordination of Policies, External Assistance and Central Public Administration
http://www.ncu.moldova.md/pageview.php?l=en&idc=466

282. State Hydrogeological Service- Expedition Group
http://www.meteo.md/monitor/seti.htm

283. State Hydrometeorological Service
www.meteo.md

284. Strategia Națională de Dezvoltare a Republicii Moldova 2012 – 2020
http://particip.gov.md/public/files/strategia/Moldova_2020_proiect.pdf

285. Teacher Education policies in Republic of Moldova
http://www.pef.uni-lj.si/tepe2008/papers/Cara.pdf

286. The State Agrarian University of Moldova
http://www.uasm.md/en/admission/23-ciclul-ii-masterat/80-specializari-si-planul-de-inmatriculare-ciclul-ii –

287. USA – Millennium Challenge Corporation
http://mca.gov.md/ro/platforma.html

288. World Bank project – Management of disasters and climatic risks in Moldova" (2010-2013).
http://www.meteo.md/bm20102013.htm