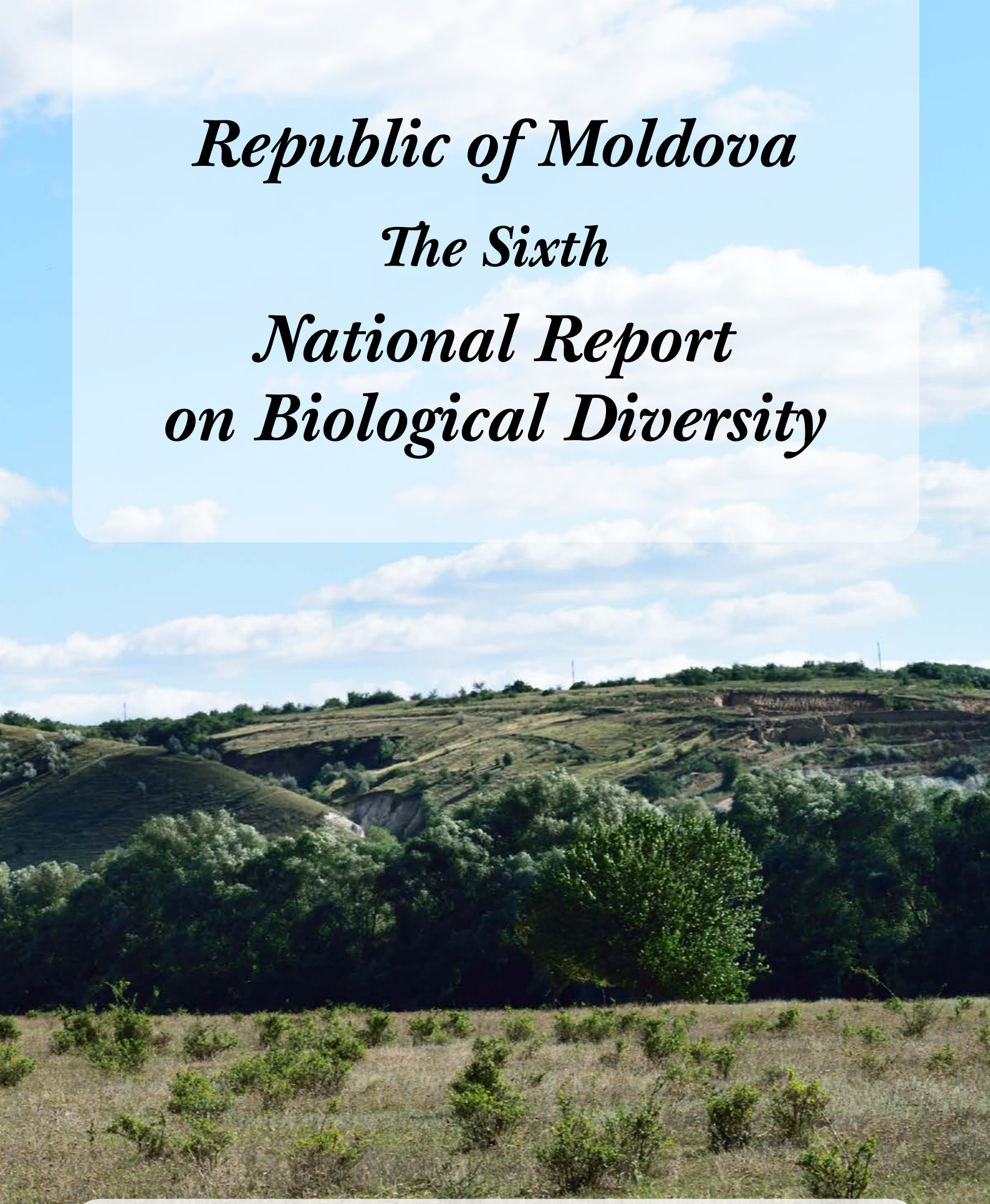
Republic of Moldova

The Sixth

National Report on Biological Diversity



Convention on Biological Diversity

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Republic of Moldova

The Sixth

National Report on Biological Diversity

CHISINAU, 2019

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Coordinators: Valentina Țapiș, State Secretary, Ministry of Agriculture, Regional Development and Environment, Alex Owusu-Biney, Portfolio Manager, UN Environment, Antony Kamau, Project manager 6NR, UN Environment

Authors: Dr. Angela Lozan, Veronica Josu, Charles Gbedemah, Ion Cotofană

With contribution: Dr. Valeriu Caisîn, Ion Apostol, Vadim Stîngaci, Maria Nagornîi, dr. Mihai Lesanu, dr. hab. Galina Bușmachiu, dr. Victoria Nistreanu, dr. Aliona Miron, dr. Dumitru Bulat, Andrei Ursache, Ion Mărginenu, Maia Guțu, Marcela Vatamaniuc, Mihai Mocanu, Gheorghe Cruceresc u, Viorel Miron, Ala Cojocaru.

Literary editor: Marius Chiriță

Translator: Elena Bivol

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Ministry of Agriculture,
Regional Development and Environment
Address:
Str. C. Tanase nr. 9
Chișinău MD-2005
Republic of Moldova
e-mail: madrm@madrm.gov.md
Web: http://madrm.gov.md

Biodiversity Office
Environmental Projects Implementation Unit
Ministry of Agriculture, Regional Development and Environment
Str. Mitropolit Dosoftei 156A, of.305
Chișinău MD-2004
Republic of Moldova
E-mail: biodiv@biodiversitate.md
Web: http://chm.biodiversitate.md

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Foreword

Conservation of biological diversity at the level of ecosystems, species, populations and genes is one of the main concerns of man in the third millennium. The problem is that with advancing technological progress and intensive use of natural resources, the impact of anthropogenic impact on biological diversity has greatly increased, substantially diminishing the number of species and varieties of living organisms inhabiting Terra.

The Republic of Moldova is part of the UN Convention on Biological Diversity of 1995 and ratified its two Protocols – the Cartagena Protocol on Biosafety (2003), including the Nagoya – Kuala Lumpur Supplementary Protocol on Liability and Redress to the Cartagena Protocol on Biosafety Protocol Biosafety and the Nagoya Protocol on Access and Benefit Sharing (2016).

The ratification of the Convention has determined the competent authorities of the country to take a number of measures to encourage the preservation of biological diversity.

Thus, the Government of the Republic of Moldova approved in 2015 the Second Biological Diversity Strategy of the Republic of Moldova for the years 2015–2020 and the Action Plan for its implementation.

The elaboration of this Strategy was dictated by the political vector of European integration of our country, the current requirements for the approximation of the national legislation to the provisions of the EU Directives and the need to implement a framework policy on the conservation of biological diversity and the rational use of natural resources of flora and fauna.

The strategy highlights the country's priority problems under the current conditions of the development of society and defines the strategic objectives according to the participation of the national economy sectors in the processes of biodiversity protection.

In the process of developing the strategy, the recommendations set out in the Global Biodiversity Strategic Plan 2011–2020, including the Aichi Biodiversity Targets and the EU Biodiversity Strategy to 2020, have been taken into account, assessing each country's causes of biodiversity degradation and establishing measures to reduce the risk of plant and animal kingdom loss for decades to avoid environmental, social and economic decline in the population.

One of the important commitments to the Convention on Biological Diversity is the elaboration and presentation of the National Report on the implementation progress of the provisions of the Convention and the decisions of the Conference of the Parties. The 6th National Report of the Republic of Moldova on Biodiversity Conservation was elaborated in accordance with decision XIII-27 of the Conference of the Parties and with the technical support of GEF / UNEP within the project "Support for the preparation of the sixth national CBD report".

The 6th National Biodiversity Report of the Republic of Moldova is structured in five (5) main parts according to the format approved by COP 13 of the Convention on Biological Diversity and includes information on the national targets and the implementing measures and the assessment of their effectiveness, barriers and related scientific and technical needs for achieving national targets, assessing the progress made in achieving each national objective and / or describing the national contribution to achieving each Aichi biodiversity target, describing the national contribution to achieving the objectives of the Global Strategy for Plant Conservation and updating the country's biodiversity profile.

The 6th National Report of the Republic of Moldova is the result of an analysis and evaluation of available data on the current state and trends of conservation and sustainable use of biodiversity. The report was drafted on the basis of an advisory process with the participation of interested ministries and institutions, representatives of academia and universities, environmental NGOs and national economy sectors and is an essential contribution to elucidating the gaps and impediments that have arisen in the application of the Actions Plan for the implementation of the Biological Diversity Strategy of the Republic of Moldova for the years 2015–2020, approved by the Government Decision no. 274/2015.

At the same time, the Report will serve as a benchmark for the transposition at national level of the "Post 2020" Global Biodiversity Framework and the implementation of Moldova's National Development Strategy "Moldova 2030", with particular reference to the fifteen Sustainable Development Goals, which also emphasizes the preservation of biodiversity and the integration of biodiversity and ecosystem values into policies at all levels by balancing the three dimensions of sustainable development: environmental, social and economic.

Target 1. Awareness of biodiversity values

The National Biodiversity Targets are stipulated in the National Biodiversity Strategy and Action Plan for 2015–2020, approved by Government Resolution No. 274 of 18.05.2015 and in conformity with the Strategic Plan for Biodiversity 2011–2020, Decision X/2 of the CBD and the AICHI Biodiversity Targets. The National Biodiversity Targets have been structured in accordance with the Strategic Scopes and the AICHI Targets, and accordingly: strategic scope A – Aichi Targets 1,2,3,4; Strategic Scope B – Aichi Targets 5,6,7,8,9,10; Strategic Scope C – Aichi Targets 11,12,13; Strategic Scope D – Aichi Targets 14,15,16; Strategic Scope E – Aichi Targets 17,18,19,20. The National Biodiversity Targets are structured in the NBSAP, involving 5 Specific Objectives (A, B, C, D, E) that include a total of 15 Scopes of Actions and 96 Actions. The Specific Objectives correspond to the Strategic Scopes, and the Scopes of Actions – to the Aichi Biodiversity Targets. *https://www.cbd.int/doc/world/md/md-nbsap-v2-en.pdf*

Biodiversity values in Moldova

The territory of the Republic of Moldova is composed of two main natural areas: forest steppe and steppe. The forest steppe area is located in the northern and central parts of the country and is a hilly plain with alternating plains and plateaus. The steppe area is located in the south and south-east of the country. Agricultural and urban ecosystems comprise almost 85% of Moldova's territory, while natural and semi-natural ecosystems – about 15%. Major portions of natural and semi-natural ecosystems have a high degree of degradation. The main natural ecosystems of Moldova are: (i) the forest (11.2% of the country's territory), (ii) the steppe (1.9% of the country's area, located in 2 areas in the North and South) % of the country's surface), (iv) rocky or petrified habitats (0.68% of the country's territory).

The Dniester river at Slobozia Vărăncău village.

The Republic of Moldova with an area of 3,384,300 ha is located in South Eastern Europe between Romania and Ukraine. The relief is largely hilly with a maximum altitude of 429.5 m. The territory of Moldova is located at the junction of three main ecoregions of Europe: the mixed Central European forests, the Pontic steppe and the Eastern European silvo-steppe. At the same time, two thirds of the area are occupied by agricultural land, and about 15% of the territory is covered by natural vegetation, most of it being degraded. Generally, this natural vegetation includes forest ecosystems. Natural steppe habitats are almost non-existent and are currently used as grassland. They are predominantly located in the north and south of the country and occupy a total of about 65,000 hectares (about 1,9% of the territory). Meadow ecosystems, with great genetic diversity and species, continue to be used for grazing livestock and occupy about 10% of the country's territory. Vegetation communities associated with aquatic ecosystems – especially flooded areas on the lower Prut and Nistru rivers – cover about 94,000 ha (about 2,8% of the country's territory). There are about 3000 flowing waters and 60 lakes in Moldova, and over 95% of the watercourses flow into one of the two major rivers – Prut or Nistru.

Moldova is rich in species, and agri-forest biodiversity is dominant. There are 1,842 species of vascular plants and about 4,600 species of inferior plants and fungi. These include 13 relict species, in the 3rd Red Book (2015) there are 208 plant and fungal species and 4 species at the limit of natural spread. The diversity of plant species is particularly high in forests (over 850 species), meadows (about 650 species) and steppe (over 600 species). There are about 16,540 animal species (461 vertebrates and over 16,000 invertebrates) in Moldova. These include 55 Ponto-Caspian relic species (of which 10% are endemic to the Black Sea Basin) and 219 species in the 3rd Red Book (2015). Many animal species have disappeared completely in Moldova over the last centuries. Although the greatest diversity of vertebrates is recorded in forests (172 species), 153 (89%) of these species are found in forests associated with meadows. Riverside corridors and wetlands are particularly important for migratory birds.

Administrative reform

In 2018, the central public administration has been reformed, the Department of Natural Resources and Biodiversity (10 staff units) within the Ministry of Environment was reorganized into Biodiversity Policy Department (5 staff units) within the Ministry of Agriculture, Regional Development and Environment. *http://www.madrm.gov.md/*

The Environmental Agency, an administrative authority subordinated to the Ministry of Agriculture, Regional Development and Environment, was established by Government Decision no. 549 of 13.06.2018, being responsible for the implementation of the state policy for protection and use of animal kingdom and vegetal kingdom, biological resources aquatic conservation, biodiversity conservation and management of the state-protected natural areas and biosafety.

International collaboration

The Republic of Moldova is party to ten international and regional conventions and agreements in the field of biodiversity. The national reports have been prepared and submitted accordingly, and reflect the implementation status of respective conventions/agreements at the national level.

- Convention on Biological Diversity (Rio de Janeiro, June 1992), 1993.

http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=306829,
https://www.cbd.int/countries/?country=md

- Cartagena Protocol on Biological Security (Montreal, January 29, 2000, 2002.

http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=312964,
http://bch.cbd.int/about/countryprofile. shtml?country=md

- Nagoya Kuala-Lumpur Supplementary Protocol to the Cartagena Protocol on Biosafety, 2018. *http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=376280*
- Nagoya Protocol on Access to Genetic Resources and Fair and Equitable Distribution of Benefits Resulting From Their Use (ABS) (Nagoya, 29 October 2010), 2016.

https://absch.cbd.int/countries/MD, https://absch.cbd.int/countries/MD

- Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), (Washington, 1973), 2000. *http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=311798*,

https://cites.org/sites/default/files/reports/11–13 Republic of Moldova.pdf,
https://www.cites.org/sites/default/files/annual_reports.pdf

- Convention on the Conservation of Migratory Species of Wild Animals (Bonn, 1979), 1979.

http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=359897,
https://www.cms.int/sites/default/files/document/cms_cop12_nr_mda_e.pdf

- Bird Conservation Agreement in Europe (London, December 4, 1991)
- BirdLife International, *https://www.birdlife.org/europe-and-central-asia/partnership*
- Agreement on the Conservation of Populations of European Bats, (EUROBATS,) 2000.

http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=311797
http://www.eurobats.org/sites/default/files/documents/pdf/National_Reports/Inf. MoP7_.29-National%20Implementation%20Report%20of%20Moldova.pdf

- Agreement on the Conservation of African-Eurasian Migratory Water Birds (Hague, 1995), 1995

http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=359900,
https://www.unep-aewa.org/sites/default/files/document/nr_aewa-mop6_moldova.pdf

- Convention on the Conservation of European Wildlife and Natural Habitats (Bern, 1979), 1993.

http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=306829

- Convention on Wetlands of International Importance (Ramsar, 1971), 2007.

http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=309166,
https://www.ramsar.org/sites/default/files/documents/2014/national-reports/COP12/cop12_nr_rep_moldova.pdf.

- International Treaty on Plant Genetic Resources for Food and Agriculture and the United Nations Food and Agriculture Organization (FAO) Committee on Genetic Resources for Food and Agriculture. *http://www.fao.org/plant-treaty/en/*

Regional collaboration

The cooperation in the field of environmental protection between the Republic of Moldova and Romania is based on 5 bilateral agreements:

http://www.mfa.gov.md/img/docs/lista_tratate_bilaterale_new.pdf,
http://www.mfa.gov.md/img/docs/Lista-Tratate-multilaterale_09_01_18.pdf

- Memorandum of Understanding Between the Ministry of Environment of the Republic of Moldova and the Ministry of Environment and Forests of Romania on Cooperation in the Field of Environmental Protection, signed in Bucharest on 27 April 2010.
- Agreement Between the Government of the Republic of Moldova and the Government of Romania on Cooperation for the Protection and Sustainable use of the Prut and Danube rivers, signed in Chisinau on 28 June 2010.

- Third Additional Protocol Between the Government of the Republic of Moldova and the Government of Romania to the Agreement between the Government of the Republic of Moldova and the Government of Romania on the Implementation of the Technical and Financial Assistance Program, signed in Chisinau on December 10, 2013.
- Agreement Between the Government of the Republic of Moldova and the Government of Romania on Cooperation in the Field of Fish Resources, Protection and Regulation of Fishing in the Prut River and Costesti-Stânca Reservoir, signed on 1 August 2003 at Costesti-Stânca.

Agreement Between the Ministry of Environment and Territorial Planning of the Republic of Moldova, the Ministry of Waters, Forests and Environmental Protection of Romania and the Ministry of Environment and Natural Resources of Ukraine on Cooperation in the Area Formed by the Danube Delta and Prutul de Jos Protected Natural Areas.

The Moldovan-Ukrainian cooperation relations in the field of environmental protection are based on bilateral cooperation agreements on environmental protection, including the protection of the Nistru river, as follows:

- Agreement Between the Government of the Republic of Moldova and the Government of Ukraine on Joint Use and Protection of Border Waters (signed in Chisinau, November 23, 1994);
- Agreement Between the Ministry of Ecology and Natural Resources of the Republic of Moldova and the Ministry of Waters, Forests and Environmental Protection of Romania and the Ministry of Environment and Natural Resources of Ukraine on Cooperation in the Area Formed by the Danube Delta and the Lower Prut Protected Natural Areas (signed in Bucharest on 5 June 2000);
- Agreement Between the Government of the Republic of Moldova and the Cabinet of Ministers of Ukraine on Cooperation in the Field of Protection and Sustainable Development of the Nistru River Basin (signed in Rome on 29 November 2012).

Public awareness

The National Forestry Consultancy Office of the Republic of Moldova was launched in March 2015 under the ENPI FLEG II Project. The priority task of the Office is to ensure the management of communal forestry stock through correct and timely enforcement of technical regulations in the given area and the provision of consultancy, expertise and technical, economic and legal assistance in the forest management process.

http://www.enpi-fleg.org/news/moldova-launches-national-forestry-consultancy-office/

In November 2016, in Slobozia Mare, Cahul district, an Environmental Information and Ecological Education Center of the Prutul de Jos Biosphere Reserve was established and started operation. The Center was created following the implementation of the project "Strengthening the Network of Protected Natural Areas for Biodiversity Protection and Sustainable Development in the Danube Delta and Prutul de Jos Region – PAN Nature" financed by the Joint Operational Program Romania – Ukraine – Republic of Moldova, 2007 – 2013, implemented by the Forestry Agency " Moldsilva ". The Center will contribute to the achievement of objectives of sustainable social-economic development in the area of activity, raise awareness and educate the public, local community, children, NGOs, and exchange experience between the local and international specialists.

Information and public awareness actions on the importance of biodiversity conservation were taken in the context of global events included in the calendar of environmental events. The Ministry of Agriculture, Regional Development and Environment and its units, the Academy of Science, the Moldsilva Agency, and its subordinated entities organized and participated in various events dedicated to national and international environmental events, such as: Biodiversity Caravan, Bird's Night Festival, National Day for

Peace Enlightenment "A Tree for Our Survival", Planet Hour, International Biodiversity Day, International Day of Forests, World Wetlands Day, World Environment Day, World Water Day, International Bird Day, Night Researcher, and Night Bats.

Education

Long term training in the field of biodiversity conservation is ensured by the University and VET education system institutions: State University of Moldova, State University "D. Cantemir ", Tiraspol State University (Chisinau), State University of Medicine and Pharmacy" N. Testemițanu, State University "Alecu Russo" from Bălți, Technical University of Moldova, Free International University of Moldova, and colleges: Ecology College, Center for Excellence in Horticulture and Agricultural Technologies, Center for Excellence in Viticulture and Wine-Making. The PhD degree schools offer doctoral and post-doctoral degrees courses.

The higher education institutions in the Republic of Moldova have been upgraded and developed new university courses meant to ensure the training of specialists in environmental protection and biodiversity conservation. Also, new specialties have been proposed for master courses, and new master programs have been introduced.

State University of Moldova (*https://www.usm.md*):

Faculty of Biology and Soil Sciences: *Bachelor degree* – Biodiversity Conservation, State Environmental Expertise, Environmental Protection, Environmental Risk Assessment, Environmental Engineering, Environmental Management;

Master degree – Subsoil Management and Protection, Biodiversity Protection, Biological Security, Integrated Environmental Monitoring.

Faculty of Chemistry and Chemical Technology: *Bachelor Degree* – Environmental Economics and Sustainable Development, Chemical Control of Natural Water and Wastewater, Monitoring and Forecasting of Air Pollution; *Master Degree* – Utilization of Natural and Synthetic Compounds in Waste, Use of Activated Coals in Environmental Protection.

State Agrarian University of Moldova: (*https://www.uasm.md*):

Faculty of Agronomy: *Bachelor Degree* – Environmental Protection, Environmental Protection Management, Biodiversity Conservation, Ecological Risks and Sustainable Development, Biosafety in Agroecosystems; *Master Degree* – National Food Security Strategies, Environmental Inspection of the Environment, etc.

Faculty of Horticulture: Bachelor Degree – Biological Protection, Organic Technologies in Fruit Growing, Integrated Protection; *Master Degree* – Forest Biodiversity and Protected Areas, Ecological Reconstruction of Forests, Biodiversity of Agroecosystems and Their Protection, etc.

During 2011–2018, new courses and special modules on environmental protection and biodiversity conservation were proposed and implemented in various state-owned and private higher education institutions of the Republic of Moldova.

Ecological class hours have an important role in environmental education. They are usually planned for the beginning of the school year and during international environmental holidays (e.g. Earth Day, Biodiversity Day, Birds Day, etc.), upon initiative of the Ministry of Education, Culture and Research and of the Ministry of Agriculture, Regional Development and Environment.

Extracurricular activities

Ecological class hours, as well as other activities related to environment protection and biodiversity conservation, involve various environmental NGOs (listed). They propose various contests on the ground, etc., which contribute to informing the young generation about the need for environment protection and biodiversity conservation. For example, the "Ecologists' Club" of the "National Youth League of Moldova" recently organized a National Ecology in Prose, Lyrics and Colors (2nd edition) *(www.ligatineretului.md)* between 12 March and 2 May 2018.

National Olympiads on Ecology, Biology, Geography, and Science are currently organized by the National Curriculum and Evaluation Agency. They are held annually under the conditions established by Order of the Minister of Education, Culture and Research, and based on the approved Regulation (*www.mecc.gov.md*).

The 2017 edition of the Republican Olympiad on Ecology gathered 64 schoolstudents from 23 districts, while in 2018 there were submitted 28 projects developed by 58 schoolstudents from 24 districts/ municipalities.

http://www.aee.edu.md/content/olimpiada-republican%C4%83-la-ecologie-2018http://aee.edu.md/content/rezultatele-olimpiadei-republicane-la-ecologie-edi%C8%9Bia-xxi
https://www.realitatea.md/ei-sunt-viitorii-aparatori-ai-naturii--cunoaste-i-pe-castigatorii-olimpiadei-republicane-de-ecologie_17048.html

The National Olympiad in Biology (held in 2018, the 54th edition) is usually held during March-April of each year. It is carried out for graders IX, X, XI, and XII, in two stages: theoretical test and practical test. The winners (segments I – III) per class can participate in the barrage test to be selected for participation in the International Biology Olympiad.

Awareness of biodiversity values has been promoted through a number of short term trainings, thematic workshops, special events, and long term and on-going education.

The main scientific institutions that develop research in the field of plant diversity conservation include the National Botanical Garden (Institute) Alexandru Ciubotaru, the Institute of Ecology and Geography, the Institute of Genetics, Plant Physiology and Protection, the Forestry Research and Management Institute, the Scientific Reserves "Codrii, "Plaiul Fagului", "Prutul de Jos" and "Padurea Domneasca".

Training

Various groups of stakeholders have been involved in the awareness raising process. Among them are government representatives from the environmental, agricultural, forestry, healthcare, educational, tourism sectors, as well as academia, non-governmental organizations, consumer and farmer associations, students, women and youth. See attached below the information on trainings and workshops organized during 2014–2018.

Publications

A number of books and brochures on biodiversity conservation have been published and disseminated over the past period. Among them are academic books, manuals, brochures, leaflets, etc., designed for different audiences, including academia, civil servants, decision makers, students, school children, general public and women. The list of publications can be found below.

Gender equality

The Strategy for Ensuring Equality Between Women and Men in the Republic of Moldova for 2017–2021 and its Action Plan, approved by Government Resolution No. 259 of 28.04.2017 is aimed at educating respect for the rule of law in insuring the protection of human rights, ensuring the rule of law values, economic growth and sustainability of the society, in general. It establishes that gender equality and elimination of all forms of discrimination against women and girls is not only a fundamental right, but also a precondition for the economic development of the country. *http://lex.justice.md/md/370442/.. http://lex.justice.md/md/370442/*.

The Women's Law Center (*http://cdf.md*) was been established to promote gender equality and participation.

Femeile au fost implicate în pregătirea Raportului VI cu privire la implementarea Strategiei privind diversitatea biologică a Republicii Moldova pentru anii 2015–2020 şi Planului de acțiuni pentru implementarea acesteia, în proporție de 40% și au oferit o contribuție consistentă și profesională.

Women have been involved in the preparation of the 6NR on the CBD 2015–2020 and Action Plan for its implementation in proportion of 40%, and provided a consistent and professional work and contribution.

The UN Sustainable Development Goals (SDGs)

According to a study on Adapting the 2030 Agenda on Sustainable Development to the Context of the Republic of Moldova, carried out in 2017, the national policy agenda is only partially aligned to the Sustainable Development Goals (SDGs), and one third of SDG targets are not included in any of the national policy papers. The Sustainable Development Goals are included in 4 sectors: economic (SDGs 8, 9, 11 and 12), social (SDGs 1, 2, 3 and 4), environmental (SDGs 6, 7, 13, 14 and 15), and governance and human rights (SDGs 5, 10, 16, and 17).

The activities carried out by Moldova under the ABT1 contribute to meeting SDG 4 goals to ensure education for sustainable development gender equality, ensure the acquiring of knowledge and skills. SDG 12 Goals will also be reached by insuring access of people to information and awareness for sustainable development.

http://www.md.undp.org/content/moldova/en/home/library/sdg/na_ionalizarea-agendei-de-dezvoltare-durabil-in-contextul-republ/adaptarea-agendei-2030-de-dezvoltarea-durabil-la-contextul-repub.html

Botanical Garden, Chisinau

Target 2. Integration of biodiversity values

NBSAP stipulates the need to integrate biodiversity conservation provisions into the most important sectoral policy documents by 2020

Direct or tangential provisions have been included in some policy documents, including in sectoral ones.

Environmental Strategy for 2014–2023, approved by Government Decision No. 301 of 2014 aims to determine the basic principles and priorities in the field of environment protection, rational use of natural resources and sustainable development of the country, ensuring synergy in the implementation of international obligations assumed by the Republic of Moldova.

http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=352740

Strategy for Sustainable Development of Forestry Sector in the Republic of Moldova, 2001.

http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=308876

Water Supply and Sanitation Strategy (2014-2028), 2014. *http://lex.justice.md/md/352311/*

Agriculture and Rural Development Strategy for 2014–2020, approved by Government Resolution No. 409 of 2014, includes a number of actions designed to contribute directly or indirectly to biodiversity conservation by implementing projects for agricultural land consolidation, extension of irrigated agricultural land areas, development of low till technologies, development and promotion of organic farming system, improvement of the energy efficiency and increased use of renewable energy sources, rehabilitation of forestry buffer stripes of agricultural fields, etc.

http://lex.justice.md/md/353310/.

Strategy for Sustainable Development of Tourism in the Republic of Moldova for 2003–2015, approved by Government Resolution No. 1065 of 02.09.2003, refers to ecological tourism.

http://lex. justice.md/viewdoc.php?%20action=view&view=doc&id=295652&lang=1

The Draft Ecotourism Development Program in the Republic of Moldova for 2017–2020 was elaborated but not approved by the Government. The main activities will be mainly oriented towards the development of ecotourism, nature preservation, and increasing the quality of ecotourism services.

http://turism.gov.md/?pag=proiecte&opa=view&id=102&start=&l=

National Strategy for Regional Development 2016–2020, approved by Law No. 239 of 2016 stipulates that environment protection projects have to be included in the development programs.

http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=368696

Soil Fertility Conservation and Enhancement Program for 2011–2020, approved by Government Resolution No. 626 of 20.08.2011 is supported by an Action Plan for its implementation.

http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=339882

- *Government Resolution No. 138 of 2014 on Approving the Action Plan for the Implementation of the Soil Fertility Conservation and Enhancement Program for 2014–2016*

http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=351879

and

- *Government Resolution No. 554 of 2017 on Approving the Action Plan for the Implementation of the Soil Fertility Conservation and Enhancement Program for 2017–2020*

http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=371387

Strategy for Small and Medium Enterprises Sector Development for 2012–2020, approved by Government Resolution No. 685/2012. With the view to integrate biodiversity conservation provisions into the most important sector policy documents by 2020, a new priority, and namely "Development of Green Economy for Small and Medium Sized Enterprises" was introduced by Government Resolution No. 709 of 3 June 2016.

http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=344806

National Development Strategy "Moldova 2020" – Does not integrate biodiversity conservation related issues.

http://lex.justice.md/index.php?action=view&view=doc&id=345635

National Development Strategy Moldova – 2030, approved by Law No. 333 of 2018. Among the specific objectives are improving the water and soil quality by reducing pollution from wastewater discharge; ensuring resilience to climate change by reducing the risks associated with climate change and facilitating adaptation in six priority sectors – agriculture, water resources, health, forestry, energy and transport.

https://cancelaria.gov.md/ro/advanced-page-type/snd-moldova-2030

Strategy for Adaptation to Climate Change by 2020, approved by Government Resolution No. 1009 of 10.12.2014.

http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=355945

The draft *Strategy for Adaptation of Forestry Stock to Climate Change* was elaborated in the context of implementing the provisions of the United Nations Framework Convention on Climate Change (UNFCCC)

Biodiversity values are reported in the Annual Statistic Report by the Ministry of Agriculture, Regional Development and Environment, Moldsilva Agency, and State Ecological Inspectorate. *http://www.statistica.md/.*

Within 2014–2018, a number of studies on ecosystem services were developed in Moldova, and namely:

1. A Study on Economic Value of Ecosystem Services in the Republic of Moldova was carried out in 2014 with the support of the UNDP/GEF "National Biodiversity Planning in Moldova" Project, analyzing the following aspects: (i) assessment of the ecosystem value of some protected areas; (ii) assessment of the value of ecosystem services provided by sectors (eco-tourism, forestry sector, agriculture, water supply and fishery, natural disaster and climate change).

http://chm.biodiversitate.md/information/document/Economic_Value_of_Ecosystem_Services.pdf

2. Forestry Sector and Ecosystem Services – ENPI FLEG II in the Republic of Moldova, 2017

http://www.biotica-moldova.org/library/FLEG2017.pdf

3. Evaluation of Forestry Ecosystem Services in the Republic of Moldova, 2015

http://www.enpi-fleg.org/site/assets/files/1872/fes_moldova_2015_ro.pdf

4. Report on the Evaluation of Ecosystem Services in Soroca District, 2018

http://www.md.undp.org/content/moldova/ro/home/library/climate_environment_energy/raport-privind-evaluarea-serviciilor-ecosistemice-in-raionul-sor.html

5. Report on the Evaluation of Ecosystem Services in Stefan-Voda District, 2018

http://www.md.undp.org/content/dam/moldova/docs/Stefan%20Voda%20SES%20final.pdf

6. Estimates of ecosystem service losses as a result of illicit cuttings in the Republic of Moldova, 2016.

http://www.biotica-moldova.org/library/Ecosystem_services&Illegal_cutting_Assessment_ROM.pdf

Landscape Reservation Pohrebeni

The main natural ecosystems of Moldova are: (i) the forest (11.2%), (ii) the steppe (1.9%), (iii) aquatic areas (2,85), and (iv) petrified habitats (0.68%).

Forests are the richest in Moldova in terms of biodiversity. Forest ecosystems have increased by 8 thousand ha in the recent years, reaching 13.35% of the total land of Moldova; the national target is 15%. The hardwood forest covers 93.68%, while the softwood forests stretch on about 16,9 thousand ha. However, due to the plantation of acacia species (over 40% of forests), the original composition of forest ecosystems has been modified.

The steppes now occupy only 1,9% of the territory and are the least conserved ecosystems in Moldova, although they used to occupy some 60% of the country's territory.

The value of the provisioning service food for the ecosystems in agriculture is estimated at around $21,900.6 million in 2011. The carrying capacity is under – used and SEM implies a decrease in the value of food provided by pastures in the short and long term. However, the annual values after 10–15 years are significantly higher than the BAU values. In addition, BAU scenario may sometimes bring irreversible damage to ecosystems. The SEM scenario might lead to a significant increase in vegetal production due to the value added by organic products. A continuation of BAU in terms of agriculture could cost Moldova's economy some $10,695.784 million over the next 25 years (this is based on the cumulative value of SEM relative to BAU).

Aquatic ecosystems/wetlands are habitats for species of aquatic plants, including those included in the Bern Convention lists. In wetlands, there are important concentrations of invertebrate species, some rare mammalian species. During the last 10 years, agricultural land increased by 57 thousand ha (or 2.87%), while the water ecosystems decreased by 600 ha (or 0.7%). The most affected are water basins, which cover 2.52% of the territory of the country, remaining among the most vulnerable ecosystems.

Sustainable Development Goals

The activities under the ABT 2 have contributed to the achievement of SDG 1. – End poverty in all its forms everywhere.

The Strategy Moldova – 2020, 2012. *http://green.gov.md/pageview.php?l=en&idc=40* has a well-defined objective to ensure quality economic development and, implicitly, reduce poverty. In the medium and long terms, it is to promote well-being – including public health, personal security, access to culture, and, but not least, a clean environment. This will be done by:

(i) Achieving an economic growth rate that would allow increasing the funding for environment protection measures;

(ii) Insuring a balanced regulation of the business environment, both in terms of economic impact and impact on the environment.

The mainstreaming of biodiversity issues in the sectoral policies will facilitate economic growth, improve the economic income from ecosystem services, and the well-being of rural population. The measures for protecting the natural ecosystems and maintaining the biodiversity will provide a balance and an improvement in production and consumption of the population.

SDG 15 – by 2020, integrate ecosystem and biodiversity values into national and local planning, in the development process, and poverty reduction strategies and account. The biodiversity issues have been integrated partially into sector strategies and policies.

Astragalus excapus. Bujeac stepe.

Target 3. Incentives

The NBSAP 2015–2020 in its Action Plan, Specific Objective A, Activity 14, stipulates the need to promote fiscal stimuli and taxes for biodiversity conservation. The action is required to be fulfilled by 2017. The mechanism of stimuli has not been developed and is not in place. The activity has not been fulfilled due to the insufficiency of human and financial capacities, institutional reformation of the Environmental authority that caused a transition period in its activity.

Prut River, at Sculeni village

The outcrop of the sloping terrace of the Prut River

Target 4. Use of natural resources

Natural resources (biodiversity, forestry products, land, water, eco-tourism resources, etc.) are important for some large production sectors in the Republic of Moldova (agriculture, forestry, tourism, etc.), but also for smaller sectors (pharmacology, perfumery, apiculture, hunting, sericulture, helicopter, etc.).

Statistics on the use of biodiversity resources are largely lacking due to the large dispersion of uses, but also due to the difficult aggregation methodologies presented by economic entities or households. Sectoral statistics are useful for assessing the demand for and consumption of different types of natural biological resources, especially agriculture, forestry, fish farming, as well as for indirect estimation for tourism, hunting and other areas consuming biodiversity resources.

Agriculture

Agriculture has an important socio-economic role in the development of the Republic of Moldova. This sector produces about 12% of the GDP, employing over 30% of all those working in the national economy. The income of the majority of the rural population, which accounts for about 60% of the country's population, depends predominantly on the results of activities in the agrarian sector. The share of agricultural land in the Republic of Moldova occupies 74.9% (about 1500 thousand ha). Grain crops and grain legumes occupy about 63.7% of the total area, including –42.8% of spring crops. The largest area for spring cereal crops is occupied by corn, sunflower, tobacco, and sugar beet. The share of these in the structure of sowing crops is 20.6%. The share of berries and potato legumes is 6.1%, of forage crops – 8.2%, and of other crops – 1.4%. To date, the production of small quantities of agricultural products predominates. In fact, half of the agricultural land is used by peasant farms working an average land area of maximum 10 ha, and by households. In recent years, they have produced more than 40% of cereals and legumes, about 30% of sunflower, more than 80% of potatoes and vegetables, more than 95% of chicory crops, about 50% of fruits and vegetables, and more than 75% of grapes. However, the structure of cultivated crops has degraded over the last 25 years: the share of high value vegetable production has decreased, the production of seed, propagating and other reproductive material has decreased as well.

The annual and seasonal changes in climatic conditions attribute vulnerability to the crop production sector, especially in the central and southern regions of the country. Measures taken by the state to reduce these risks in agriculture are rather modest and, for the time being, do not deliver the expected results. As a result, the annual activity balance of the agrarian sector is very unstable. For example, as a result of the drought in 2012, the volume of agricultural production declined by 22%, while in 2013 it increased by 39%. The potential of irrigated area exceeds 310 thousand ha (reached in 1990), but currently it is 16.3 thous. ha (2011). Similarly, agriculture is influenced by the reduction of soil fertility (by about 0.5% annually), forest degradation, and groundwater pollution.

Due to pedo-climatic conditions, a number of traditional agricultural businesses are developed, such as strawberry growing, which lasts until late autumn, and cultivation of forest berries (raspberries, blackcurrants, barberry, blackberries, sea buckthorn, rowan, bilberry, horn, goji, iosta). In 2017, planted areas increased to 3.5 thousand hectares. Their productivity is high (strawberries – 5,13 t/ha, raspberries – 1,9 t/ha, currant – 0,35 t/ha, barberry – 0,08 t/ha) and they are sold on the domestic market or exported. At the same time, the total area occupied by nut crops constituted 29 thousand hectares, with an yield of 31 thousand tons of nuts in 2016/2017, which was almost all practically exported. Areas covered by walnuts include anti-erosion strips of the plains, the alignment strips along the roads and individual farms (about 20 thousand ha), and 15 thousand ha of orchards planted in the past ten years. A total of 34 walnut varieties, 8 almond varieties, and 1 hazelnut variety are approved in the Republic of Moldova, and

there are already over 1000 nut plantation owners operating based on the Law on Nut Crops. In 2015, Moldovans exported $ 108 million worth of nuts. Only 7% of the Earth's surface is favorable for growing walnuts. The Republic of Moldova falls into this area. The average life of a walnut is 300 years and all components of walnut (fruit, leaves, bark, wood) can be used for the benefit of people. In 2017, the government provided subsidies in the amount of 18,000 lei per hectare for planting nuts. The Ecological Foodprint for Moldova was 7,848,967.3 global hectares in 2014. For the time series of available data through 2014, the Ecological Footprint changed at an annual rate of 1.3%. Biodiversity Indicators Partnership Dashboard. Fig. 1.

The pharmaceutical, perfumery and cosmetics industries also benefit from local biodiversity resources. The medicinal plants are usually collected in the wild, while the Botanical Garden (Institute) Alexandru Cebotaru has a genetic pool of approximately 300 herbs and aromatic plants. The Centre for Cultivation of Medicinal Plants (USMF) has an area of approximately 13 ha and a collection of over 200 herbal medicinal taxa from 15 pharmaceutical groups.

http://plantemedicinale.usmf.md/resultate-obtinute

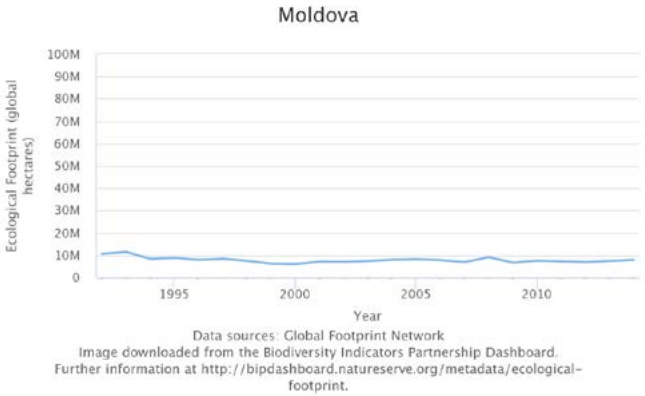


Figure 1. Ecological production in the Republic of Moldova

In Moldova, the resources of medicinal herbs and aromatic plants are very diverse: a flora of 3700 species with special curative properties, 384 of which are recognized within the WHO as medicinal plants with pharmaceutically dynamic properties and well-defined effect. There are 26 drug producers in the Republic of Moldova, 17 of them producing phytopreparations, plant products and medicinal plants, and 238 (or 20,59%) out of the total 1,156 medicine products manufactured in the country are phytopreparations, plant products and medicinal plants. The most commonly used medicinal plants are: Mentha piperita L., Valeriana officinalis, Eucalyptus globulus, Glycyrrhiza glabra, Matricaria recutita, Hypericum perforatum, Achillea millefolium, Humulus lupulus, Calendula officinalis, Foeniculum vulgare. Previously, Moldova was one of the largest producers of aromatic herbs and volatile oils, with 20 enterprises operating in this area, and growing hyssop, mountain thyme, iris, lime wormwood, annual wormwood, in addition to traditional aromatic herbs, such as rose, mint, lavender, salvia, dill, and fennel (annual production of about 200 tons of oils).

At present, there are 7 large companies growing medicinal and aromatic plants on an area of approximately 3,5 thousand ha. Most of the oil produced in the country is exported to Germany, Austria, the Netherlands, Canada, Hungary and Belgium. They are grown on certified organic land.

Cultivation of medicinal plants increases the overall productivity of land. In the future, domestic demand will increase with the development of related sectors, and namely the perfume and cosmetics industry, fruit and vegetable processing and canning industry, alcoholic and soft drinks, specialized production of medicines and pharmaceuticals.

Beekeeping

The group of pollinators includes wild insects, especially of Apiidae family, which includes bees and bumblebees. In addition to crops used by humans, 90% of the wild plants depend on insect pollination. Currently (2018), there are around 6,100 beekeepers taking care of 195 thousand bee families (3,800 apiaries were registered in the Zootechnical Register) and exports increased to EU countries (Romania, Italy, France, Germany, and Spain). In 2016, 3,100 tons of honey (worth $ 8,8 million USD) were exported.

The Apis mellifera carpatica bee species grows mainly in Moldova. There are 35 invertebrate species which play an important role in plant pollination, all of which are included in the 3rd edition of the Red Book of the Republic of Moldova. The Parliament amended the Law on Beekeeping 2017, establishing new principles in beekeeping.

Heliculture or snail breeding (Helix pomatia).

This type of activity is currently under development in the Republic of Moldova and aims at creating a snail farm network, supported by the Government through several programs (eg. PARE 1 + 1 etc). The average annual snail extraction is 0,86 tons.

Sericulture or silkworm rearing (cocoons, larvae, eggs) has begun to be strongly promoted over the past years in Moldova, as well.

Forestry

Forestry has an important role in the national social and economic development of the country. This sector produces about 0,4% of the GDP. Moldova has a relatively low cover of forest vegetation (approximately 450 thousand ha or 13,7% of country's territory), while forest cover is only 11% or 379,3 thousand ha. The volume of timber harvested in the forestry stock is estimated at 46 million m^3, representing an average of 124 m^3/ha. The annual allowable cut (AAC) and the officially recorded actual harvest is around 400 – 500 thousand m3/per year. The annual allowable cut (AAC) in the forests administrated by Moldsilva is approximately 45% of the annual increment, compared to European average of 64%. (Figure 2).

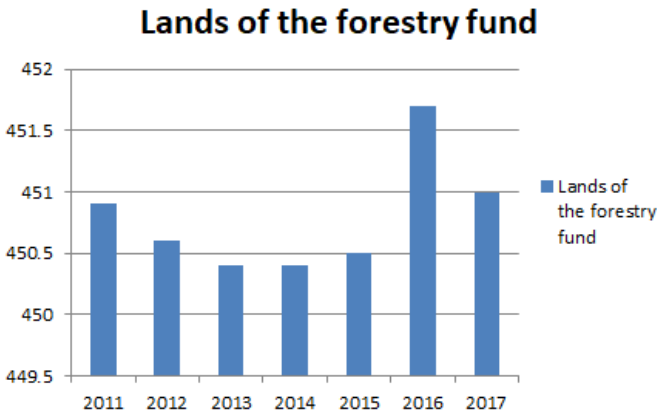


Figure 2. Dynamics of the forest fund surface

Between 2011 and 2017, the total harvested wood amounted at 563 thousand m^3, the processed timber – 35 thousand m3, and firewood – 491,7 thousand m3 annually. The timber represented an average of only 6.2% of the harvested wood volume, the remaining being firewood (93,8%). Wood products (firewood, wood for rural construction, tree branches) are normally bought by the local population. (See Figure 3)

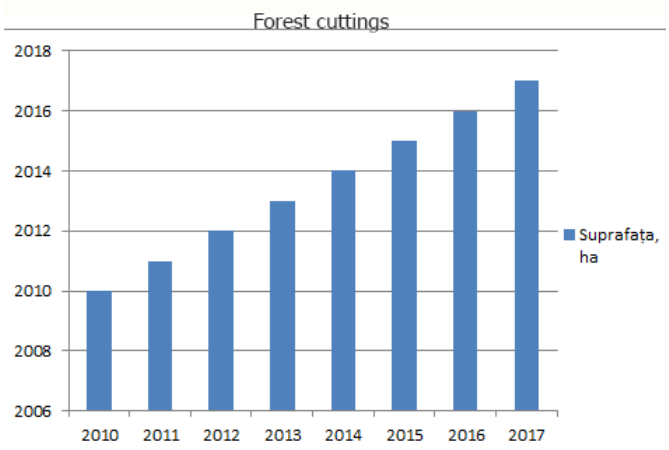


Figure 3. Dynamics of wood harvesting

Measures to reduce consumption of harvested wood.

The total area of forest for wood harvesting does not decrease due to forest plantation and restoration actions. Acacia is planted on extended areas in order meet the needs for firewood. The overall area of acacia sp. plantations is about 36,1% of the total forest area of the country. Biogas and briquette/pellet production in Moldova is also an important biofuel contribution to reduce the pressure on wood consumption by the population in rural areas. The overall biofuel production in 2016 achieved 26% of all types of fuel consumption in the country. (Annual Statistic Report, 2017)

http://www.statistica.md/pageview.php?l=ro&id=2193&idc=263

In 2014, the total biogas consumption amounted at 551Tj. The bioenergy production market is on the rise in Moldova, all the necessary components for a good market operation being created or set up. According to the statistics provide by the Energy Efficiency Agency, around 120 companies produced solid biomass fuel with a total capacity 120 000 tons at the beginning of 2016. Out of these, over 86 thousand tons were briquettes and 33,6 thousand tons were pellets. These quantities cover almost 5% of the domestic gas consumption or 42% of coal.

http://biomasa.md/piata-de-producere-a-bioenergiei/producatorii-de-biocombustibil/.

During 2011–2017, a total of 10,280 cases of illegal forest cutting were registered by the State Ecological Inspectorate, the overall damage being calculated at 8,047,5 thousand lei.

Associated forest products

The harvesting / collection of non-timber products (fruits, berries, medicinal plants, etc.) is an important part in the structure of activities undertaken by entities subordinated to Moldsilva Agency. The volume of forest non-timber products harvested / collected, processed, and sold varies depending on environmental factors and market requirements. The total volume of associated forest products (PNP) collected/ harvested during 2011–2017 constitutes 597 tons for fruits and berries, 64 tons for medicinal plants, and 4.3 tons for honey.

Hunting

Though consuming hunting resources, this activity is related to recreation and tourism in the Republic of Moldova. The hunting stock is delimited to 80 areas of 16 state forest enterprises, including 56 forest detours. At present, the stock covers 234,2 thousand ha., including 132,8 thousand ha of forests (56.7%) and 101,4 thousand ha of land (43.3%) within 500 meters around the forests (gardens, vineyards, pastures, debris, degraded land). The area occupied by hunting forests is approx. 38% of the total forest land in the country or twice as much as the wooded area of state-protected natural areas. The largest areas of hunting stocks are located in the areas managed by SSI Chişinău, Edinet and Orhei. The hunting activity on the territory of Moldova is governed by a special regulation of the National Association of Hunters and Fishermen, the national environmental, and hunting regulations in force. According to the Hunters and Fisherman's Society of Moldova, there are 15,000 authorized hunters in the country, this meaning that the interest and demand for hinting activities is significantly bigger than the actual game resource of the country.

During 2008–2018, the forestry enterprises subordinated to Moldsilva Agency evaluated the average number of wild animals as follows: 507 deer, 4,845 roebucks, 2,009 wild boars, 8,184 rabbits, 5,105 pheasants, 5,102 foxes, 1,024 badgers, 525 muskrats, 785 geese, 1,676 ducks and 1,765 partridges. Starting with 2011, the wolf is found in hunting grounds. During the reference period there was a gradual increase in the number of stock from 50 to 90. The stock of other species oscillates from year to year. Even if the hunting of roebuck was banned since 1995, the increase in stock is under annual growth.

It should be mentioned that during 2015–2016, hunting was banned for all kinds of hunting animals by the Ministry of Environment.

Measures to reduce consumption in the hunting sector. The organization of breeding enterprises is one of the efficient activities in the country. Breeding of wild birds is practiced in Moldova, including local bird species, such as partridges and quails, and alien species – pheasants and guinea fowl. The State

Ecological Inspectorate and Moldsilva Agency took measures to combat poaching. In 2017, a total number of 328 poaching cases were detected, causing total damages in the amount of 243,6 thousand lei.

To reduce the pressure on natural fishery and fish resources, fish breeding farms were created in the country. The Danceni, Stinca-Costesti, Mandic, and Dubasari water reservoirs are used for industrial fishery farming. There is a large number of small lakes and water reservoirs that practice private fishery farming, but there is no evidence and statistical data on the latter.

Tourism, the estimated area used by tourism is less than 1% of the total territory, specifically including: (i) green areas in urban and rural areas, (ii) forestry, (iii) hunting, (iv) river basins. Forest areas (forest ecosystems) represent an important potential for attracting tourists. About 45% of the total area of recreation and nature conservation forests should serve for excursion activities, recreation services and spa treatment. Aquatic ecosystems are important landscape elements for practicing tourism, fishery, and various nautical sports activities. The aquatic and curative sanitation pools, as well as fishing, hunting and nature reserves, are important tourist and leisure resources.

In 2017, the total number of foreign visitors in Moldova reached 3,88 mln persons, of whom 337,207 persons were accommodated in hotels and agro-pensions, including 154,773 persons in the rural areas. Approximately 10,000 persons visit the scientific reserve Codrii, and 30,000 persons visit the Natural/ archeological complex Orheiul Vechi every year. The estimated annual income in the tourism sector is about 170 mln. EUR.

The National Strategy for Tourism Development "Tourism 2020" and its Action Plan for 2014–2016, approved by Government Resolution No. 338 of 19.05.2014 stipulates the need to develop, among others, the following types of tourism: winery, rural, spa, excursions, cultural, gastronomic and ecologic. Touristic activities are regulated by the Law on Organization and Implementation of Touristic Activities No. 352 of 26.11.2006.

http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=353037
http://lex.justice.md/document_rom.php?id=0B88BC64%3A70678DCD.

Trade in endangered species

The Republic of Moldova has submitted its biennial national reports on the implementation of the CITES Convention on International Trade in Endangered Species of Wild Fauna and Flora. In 2015–2017, the export and import of wild species totaled 453 species, including 76 species in 2015, 142 species in 2016, and 235 species in 2017. Species imported/exported for commercial purposes – 336 species, for exhibitions and circus – 68 species, Zoo – 28 species. The list of CITES species include exclusively animal species. No local wild species from natural ecosystems of Moldova have been exported and trade marketed.

https://cites.org/eng/resources/reports/biennial.php

Sustainable Development Goals

The activities of Moldova under the ABT 4 has contributed to achievement of the SDG 2 to ensure by 2030 sustainable food production, maintain ecosystems that strengthen capacity for adaptation to climate change and natural disasters, as well as to the SDG 15 – by 2020 to ensure the conservation, restoration and sustainable use of terrestrial and inland freshwater ecosystems and their services, in particular forests, wetlands, increase afforestation and restoration etc.

Thermophilic hardwoods

Target 5. Loss of habitats

The habitats of the Republic of Moldova have not been identified and described yet. Thre is no List of habitats and a Register of Habitats developed yet. The legistation has not been develop to provide protection and conservation of habitats in Moldova. The Association Agreement Moldova-EU has stipulated needs to harmonize the national legislation with the EU Directive on Habitats. The NBSAP 2015–2020 has provide a number of actions to ensure protection of habitats in Moldova. However, due to the insufficient capacities the planned activities have not been filled out yet.

There are the following natural ecosystems in Moldova: forestry, steppe, meadow, aquatic, petrophyte etc. Moldova has relatively low cover of forest vegetation (appr. 450 *th.ha* or 13,7% of the country's territory), while forest cover is only 11% or 379,3th. ha. Within the boundaries of the forest fund, 28 types of ecosystems are identified, containing the following main types of forests: oaks, beech, hornbeam trees, black locust trees and and its varieties. The ecosystems of Quercus robur and Cerasus avium associations are spread in the north of the country and occupy an area of 11.6 th. ha. The floristic composition of these ecosystems includes approx. 350 species of vascular plants and is characterized by Quercus robur monodominant stands with a high frequency of Cerasus avium. In these ecosystems there are 10 rare plant species. Currently, these sectors are drying up, and their natural regeneration is very poor. Ecosystems of Quercus petrea, Quercus robur and Fagus sylvatica from the center of the country have an area of about 160 thousand hectares. The floristic diversity of these ecosystems is richer than that of the northern forests. The floristic composition includes over 1000 species of vascular plants, 17 of which are included in the Red Book of the Republic of Moldova. The largest floristic diversity is found in the nature scientific reserves Codrii (945 species of vascular plants) and Plaiul Fagului (720 species of vascular plants). Quercus pubescens forest associations in the south of the country occupy an area of about 7,000 ha. The floral composition includes over 400 species of vascular plants, including several species included in the Red Book of the Republic of Moldova.

The azonal forest ecosystems in the rivers Prut, Nistru and their tributaries consist of willow, poplar and pedunculate oak (about 15 thousand hectares). The floral composition consists of about 400 species of vascular plants, some of which are endangered or vulnerable. The total area of the national forest fund increase by 6.78%, from 419.1 thousand ha (in 2010) to 447.5 th. ha (in 2016).

http://www.moldsilva.gov.md/public/files/publication/RAPORT.pdf

Considering the large diversity of tree species and their importance, the following types of areas are occupied with the dominant species: 29.5% acacia, 16.8% pedunculate oak, 13.8% oak, 8.8% ash, 8% hornbeam, 4,1%, lime trees, 2,2% white oak, 1,7% maple, 1,7% walnut, 1,5% white poplar, 1,5% willow, 9.2% other hardwoods, 1.5% various conifer species, 0.8% other species and 0.1% different exotic species.

Degradation and fragmentation of natural habitats in Republic of Moldova is due both to abiotic factors (climatic), biotic (insect pests, diseases) and to anthropogenic (cuttings, hunting, etc.). Forest habitats, along with steppe and cliff, are the most dependent and most vulnerable to climatic conditions in the region. The increased vulnerability of these ecosystems is a result of low functionality caused by fragmentation and degradation. The direct action of these factors includes changes in the humidity regime in the air and soil, the decrease of ground water level, the worsening of the foaming evapo-sweating regime, etc. Thus, the research shows that the soil humidity in some habitats at the depth of 1.5 m was 9.3%, and the plant wilting threshold was 9%. At the same time, the Central European Mesopotamian forests (beech, hornbeam and oak trees) in the north and the center of the country are at the south-eastern limit of its natural area and climate is the main factor limiting the spread of these forests. Dry years

(2007) may lead to a reduction in the mesophilic forest area, which will tend to retreat in favor of white oak woods in the south of the country.

Approx. 73% of Moldovan forest comes from shoots, and 2/3 of the surface of the forest fund has a poor state of health and low stability to the action of destabilizing biotic and abiotic factors. Analysis of forest health in the Republic of Moldova (2010-2018) shows that the area of outbreaks of diseases and pests is annually from 5% to 31% of the total area of the national forest fund and the overall trend is to increase these areas. The main species of Defoliation pests of the forest are Tortrix viridana, Operophtera brumata and Eranis defoliaria, Lymantria dispar, Stereonicus fraxin etc. The simultaneous action of biotic and abiotic factors led to the abnormal drying of forests, including the Plaiul Fagului protected area where insecticides are prohibited. Thus, it is likely that due to massive defoliation, after 10–15 years, intensive abnormal drying in ash stands, which will radically change the habitat on an area of 700 ha. Estimative assessment of damage caused by the phenomenon of abnormal drying or those caused by the mass occurrence of insects and defoliations has not been provided. Figure 4.

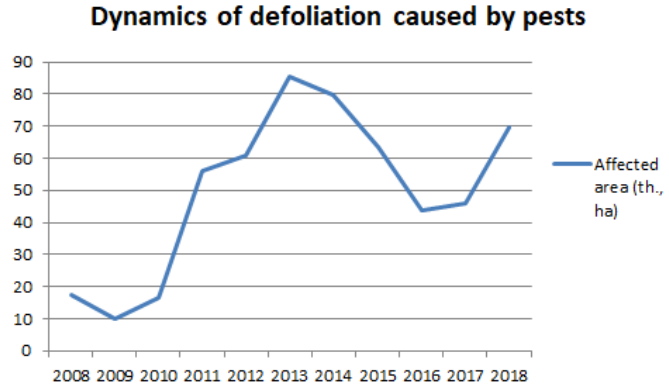


Figure 4. Dynamics of forest defoliation caused by pests

Changing of habitats can also be caused by anthropogenic interventions in forest. Spotlight woodcuts and sanitary cuts if the forest, does not radically change the habitat. At the same time, the area of authorized sanitary cuts, which improve forest conditions and forest habitats, during the same period is 188,182 ha (harvested 4,378 th. m3 of wood). Similarly, the woodcuts for main products took place on an area of 2,342.1 ha, where the forest habitats were changed with new ones, regeneration works or natural regeneration of forest habitats were undertaken, being harvested a volume of 145.6 th. m3 of wood. Biodiversity Habitat Index for Moldova is represented at the Biodiversity Indicators Partnership Figure 5.

http://bipdashboard.natureserve.org/bip/SelectIndicator.html?iso=MDA&reg=Europe

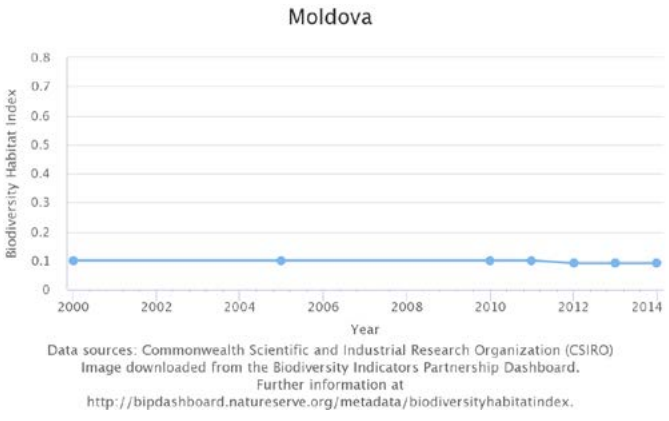


Figure 5. Biodiversity Habitat Index for Moldova

Illegal woodcuts represent a threat to forests and are one of the biggest causes of biodiversity loss. Independent studies (FLEG), funded and implemented in the Republic of Moldova by the European Commission, the World Bank and other donors such as the International Union for the Conservation of Nature (UICN) and the World Wildlife Fund (WWF) estimates illicit woodcuts in volumes of about 400–600 th. m3/year, double of the authorized annual woodcut. At the same time, the annual reports of the State Ecological Inspectorate reports that the total volume of illicit cuts during the period 2010–2017 was 6,582.32 m3 (about 4,800 cases, damage caused about 6.57 mln lei), especially in the forests administered by LPA. In the context of the findings, it is proposed to: (i) implement the National Wood Record System; (ii) carry out additional studies to determine the volumes of wood consumed in Moldova.

Evidence of the evolution of the size of forest fragmentation does not currently exist in the Republic of Moldova. The first calculations on the fragmentation of forests in Moldova were presented in 2016 by NGO "Biotica" within the ENPI FLEG II Country Program: "Assessing ecosystem services losses due to illegal logging in Moldova".

http://www.biotica-moldova.org/library /Ecosystem_services &Illegal_cutting_Assessment_ROM.pdf.

Thus, fragmentation of wooded areas i.e. the division of integral forest bodies into isolated and remote fragments affects the natural ecological processes consequently and leads to the destruction of a number of habitats. Some fragments may be smaller than those that can ensure the viability of a number of species populations and the generic exchange between them. The degree of fragmentation has been quantified using the ratio between the forest body perimeter and its surface.

The average area of the forest bodies in the country is approx. 91 ha, varying considerably depending on the region. The average area of the forest bodies in the central part is more than 1.6 times larger than the southern ones and 1.4 times then the north part of the country. If acacia plantation will be excluded from the forested territory analysis, then the assessment of the degree of fragmentation will change considerably. The average area of non-acacia forests in the country is only 4.2 ha. The average value of the fragmentation coefficient of these forests increased considerably to 22.47 (4 times), the largest being in the south (24.85) and the lowest in the center (19.25). One way to reduce the fragmentation of forest bodies is to create a national ecological network, including interconnection corridors between protected natural areas smaller and fragmented forest bodies, which is not achieved due to lack of funding.

http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=339794

At the same time, during 2010–2018 in Moldova the new forestry plantations have been created on 12,583 ha, including 9,478 ha in the state forestry fund and 3,060 ha outside the forest fund. In particular, 7,847 ha of acacia and 3,250 ha of oak were planted.

Actions taken to address the underlying causes of biodiversity loss

Several measures, including legislative, normative or practical action (new plantings, extension of protected areas, digital forest maps, forests, etc.) have been taken to stop forest fragmentation and biodiversity loss. Legislative and regulatory measures: (i) a new edition of the Forest Code drafted; (ii) a new Law on hunting and hunting fund drafted; (iii) the Strategy for Biological Diversity of the Republic of Moldova for the years 2015–2020 (GD no. 274 of May 18, 2015) was approved

http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=358781,

(iv) draft Strategy for Forestry Sector Adaptation to Climate Change of the Republic of Moldova; (v) approved the Moldovan Strategy for Adaptation to Climate Change by 2020 and its Action Plan (GD No. 1009 of 10.12.2014)

http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=355945 prepared;

(vi) the Low-Emission Development Strategy of the Republic of Moldova until 2030 and its Action Plan is approved (GD No 1470 of 30.12.2016)

http://lex.justice.md/index.php?action=doc&view=view&lang=1&id=369528;

(vii) approved the Strategy for Environmental Protection for 2014–2023 and its Action Plan (GD No. 301of 24.04.2014)

http://lex.justice.md/UserFiles/File/2014/mo104-109md/anexa_1_301.do;

(viii) all forests in the State Forestry Fund are managed by land use plans; (ix) the Regulation on allocation of land from the forest fund for the purposes of hunting and/or recreation management has been amended

http://lex.justice.md/md/327068/,

(x) the forest monitoring system through the Forest Monitoring and Protection Center has been implemented, etc.

Practical actions:

(i) Institute of Forest Research and Management (ICAS) monitors the defoliation and discoloration of the forest through the 2X2 km National Mining Network (618 sample surveys – 14,233 trees); (ii) Participation in the ICP Forest Program (9 sample surveys – 216 trees, area 20–25 *th.ha* forests with defoliation level 2-4); (iii) natural phenomena and processes are monitored in the scientific reserves (Codrii, Plaiul Fagului, Padurea Domneaca and Prutul de Jos); (iv) areas of forests have been increased (from 374.5 thousand ha in 2010 to 386.4 thousand ha in 2016); (v) 2,241.8 ha forest protection curtains were rehabilitated (2014-2017) in 75 municipalities from 12 districts (with the support of the project "Competitive Agriculture in Moldova"); (vi) 12,538 ha of forest crops were planted, including 9,478 ha in the state forest fund and 3,060 ha on the land of other owners; (vii) the area of state-protected natural areas increased by 15,808.2 ha (from 195,587.67 ha to 210,695.87 ha), including 14,700 ha by creating the Biosphere Reserve "Prutul de Jos"; (viii) the surface of outbreaks with abnormal drying land has a general trend of growth but is kept under control (in 2010 – 13.1 th. ha in 2018 – 12.0 th. ha); (ix) the Emerald Network was created by completing the law on the establishment of the National Ecological Network; (x) forest database and the Forest Map are managed by the Moldsilva Agency (*http://map.icas.com.md/*); (xi) The Moldsilva Agency and other beneficiaries have signed 748 contracts on forest rent (8,700 ha), including 689 recreational (1,789 ha) and 59 hunting (6,910 ha).

Extension and restoration of forest, pasture, wetlands

In the recent years the forest fund increased by approx. 8.0 *th.ha*, reaching 13.35% of the total territory of Moldova.

In the period 2010–2018 in the Republic of Moldova the total 12,583 ha of new forestry plantations were created, including 9,478 ha in the state forestry fund and 3,060 ha outside the forest fund.

The forest regeneration measures in the State Forestry Fund have been provided annually approx. at 3–5 *th.ha* of forest. Extension of the state forestry fund has taken on approx. 100 ha annually. The forest regeneration activity undertaken by the Moldsilva Agency in 2011–2016 reached the territory 26,069 ha.

The restoration of the pastures in the Orhei National Park with the support of the European Union has contributed to the improvement of the life of the people in the region. Total 500 hectares of pastures from Orhei National Park are restored and maintained to generate a high quantity and quality of feed. At the same time, this will alleviate soil erosion and reduce greenhouse gas emissions. It was supported through the "Clima East" project, implemented by the UNDP.

http://www.calm.md/libview.php?l=ro&idc=34&id=2844&t=/SERVICIUL-PRESA/Noutati/500-de-hectare-de-pasuni-din-raionul-Orhei-sunt-reabilitate-cu-sprijinul-European-Union/

The project "Soil Conservation in Moldova" 2000–2022 supports the rehabilitation and conservation of soils by afforestation of 20.3 thousand hectares.

http://icas.com.md/activitati-2/projects-international-in-derulare/

The project "Development of the communal forestry sector in Moldova", 2006–2035, promoted by "Moldsilva" Agency in collaboration with the BioCarbon Fund, for the creation of new communal forests on the area of 9,400 ha, by afforestation of eroded and non-productive land.

The Japan project "Community Support Program for Sustainable and Integrated Forest Management and Carbon Seizure Management through Afforestation", 2010–2014, contributed to achieve the sustainable

management through plantation of forest vegetation on 1,453 ha, including 1,162 ha of forests and 291 hectares of reconstruction /relief /replenishment works for the regeneration of forests. Also within the mini-projects, improvement is envisaged through various methods of about 608 ha of communal meadows.

https://icas.com.md/activitati-2/proiecte-internationale-in-derulare/

In the period of 2014–2017, the Biotica NGO has provided restoration work and afforestation of wetlands area of the Nistru de Jos Ramsar area on the territory of total 85.7ha in the limits Talmaza and Ciobruci settlements with the support of the projects "Improvement of Water Resources Management and Protection of Ecosystems in the Ramsar Area Nistru de Jos " and "Adaptation and Resilience Measures to Climate Change and Institutional Development in the Ramsar Area Nistru de Jos ".

http://www.biotica-moldova.org/index.htm

Extension of protected areas

In 2006, three Ramsar wetland areas of international importance have been established within the Prutul de Jos lakes, Nistru de Jos and Unguri-Holoşnița, and constitute area of 94,705.5 ha (947,06 km2).

http://lex.justice.md/md/349420/

In 2013 the National Park Orhei has been established with the area of 33,792.09 ha (337,92 km2), that lead to the extension of the total surface of protected natural areas, up to189,385.9 ha.

http://lex.justice.md/md/349420/

In 2018, the Biosphere Reserve Prutul de Jos was founded by Law no. 132 of 13.07.2018 for the purpose of preservation of terrestrial and /or aquatic geographic areas.

http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=376873.

The total area is of 14,771.04 ha, or 147.71 km2, including 824 ha, or 8.24 km2 of forestry land.

In the period of 2006–2018 the total area of protected areas of all categories has increased from 4,65% to 5,8% of total territory of the country.

The process of setting up Nistru de Jos National Park started in 2018 as a result of the implementation of the Austrian project "Adaptation based on ecosystem, measures of climate resistance and institutional development in Nistru de Jos".

https://www.entwicklung.at/en/projects/detail-en/project/show/ecosystem-based-adaptation-climate-resilience-measures-and-institutional-development-in-the-lower-d/

Ecological Networks

The National Ecological Network of Moldova as part of the Pan-European Ecological Network, has been established by the Law on Ecological Network.

http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=334071

The national ecological network consists of the following functional elements: a) core zone; b) buffer zone; c) ecological corridors; d) ecological reconstruction areas.

https://www.iucn.org/regions/eastern-europe-and-central-asia/projects/completed-projects/ecological-network-moldova

This constitute total area of 127,871ha, or 7,5% of the territory of the country. The National Program on the Establishment of the National Ecological Network for 2011–2018, approved by the Government Decision no. 593 of 1 August 2011.

http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=339794

The Emerald Network as part of the Pan-European Ecological Network and Natura 2000 has been established in the period 2009-2017with the support of the Council of Europe and the European Union project on Creation of the Emerald Network of natural areas of special protection. *https://www.coe.int/en/web/bern-convention/emerald-network*. The national database for the Emerald Network sites, species and habitats, protected under the Europe's Convention on the Conservation of European Wildlife and Natural Habitats (1979), Bern Convention have been developed. The total number of the Emerald Network sites – 52, habitats – 34 Species -144sp. The total area of the Emerald sites cover – 8% of the territory of the country. In 2018 – the list of Moldovan Emerald sites have been approved as the Adopted Emerald Network Sites. Amendments to the Law on the Ecological Network were approved to introduced Emerald Network of areas of special interest for preservation and the legal provisions for the creation of the Emerald Network on the territory of the Republic of Moldova.

http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=334071

The list of 34 habitats in Moldova of the European importance has been identified under the Emerald Network project, based on the Manual EUNIS Habitats. The database, and GIS mapping have been developed. *http://cdr.eionet.europa.eu/md*

The study Habitats of Rare Species of Plants and Animals from the Soroca and Ştefan Vodă Districts of the Republic Moldova has been published in 2017.

http://www.md.undp.org/content/dam/moldova/docs/Publications/book%20v13%20RO.pdf

UN Biodiversity Lab *https://unbiodiversitylab.org/*:

The forest cover loss rate in Moldova in the period of 2000–2017 do not exceed the aforestation rate, as it is represented in Figure 6.

The degree on Biodiversity intactness in Moldova in 2016 was appr. 80–85% that showing a medium rate of degradation of the ecoregions.

The rate of biodiversity loss in Moldova within Ecoregions for 1993–2009 is low and is identifies in the diapason of 0 to 8% and is represented in Figure 7.

Sustainable Development Goals

The activities of Moldova undertaken under the ABT 5 have contributed to achieve the SDG 13 goal to strengthen resilience and adaptive capacity to climate change hazards and natural disasters; the SDG 15 goal to ensure the conservation, restoration and sustainable use of terrestrial and inland freshwater ecosystems, by 2020 to restore degraded forests to reduce degradation of natural habitats halt the loss of biodiversity, prevent extinction of threatened species.

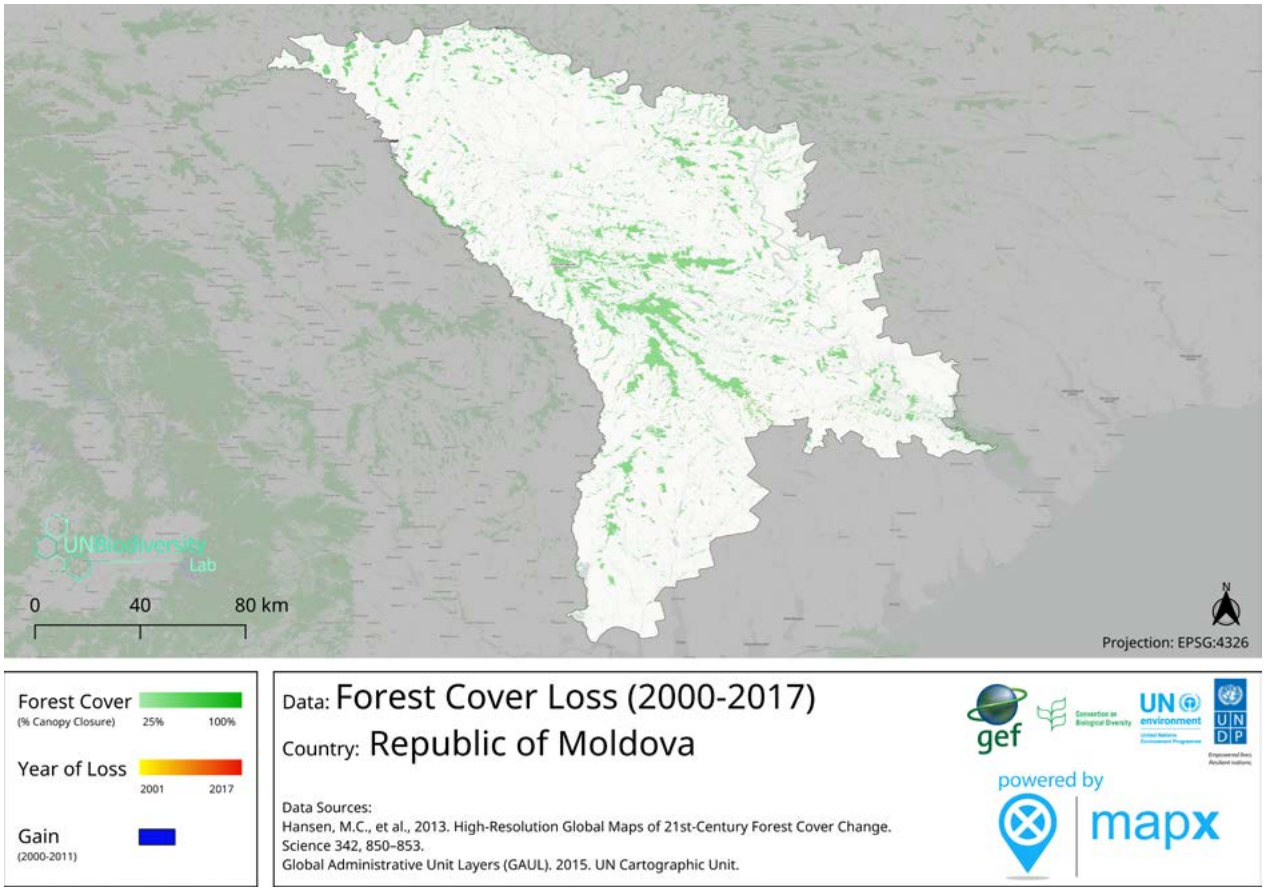


Figure 6. Rate of reduction of forest area in Moldova

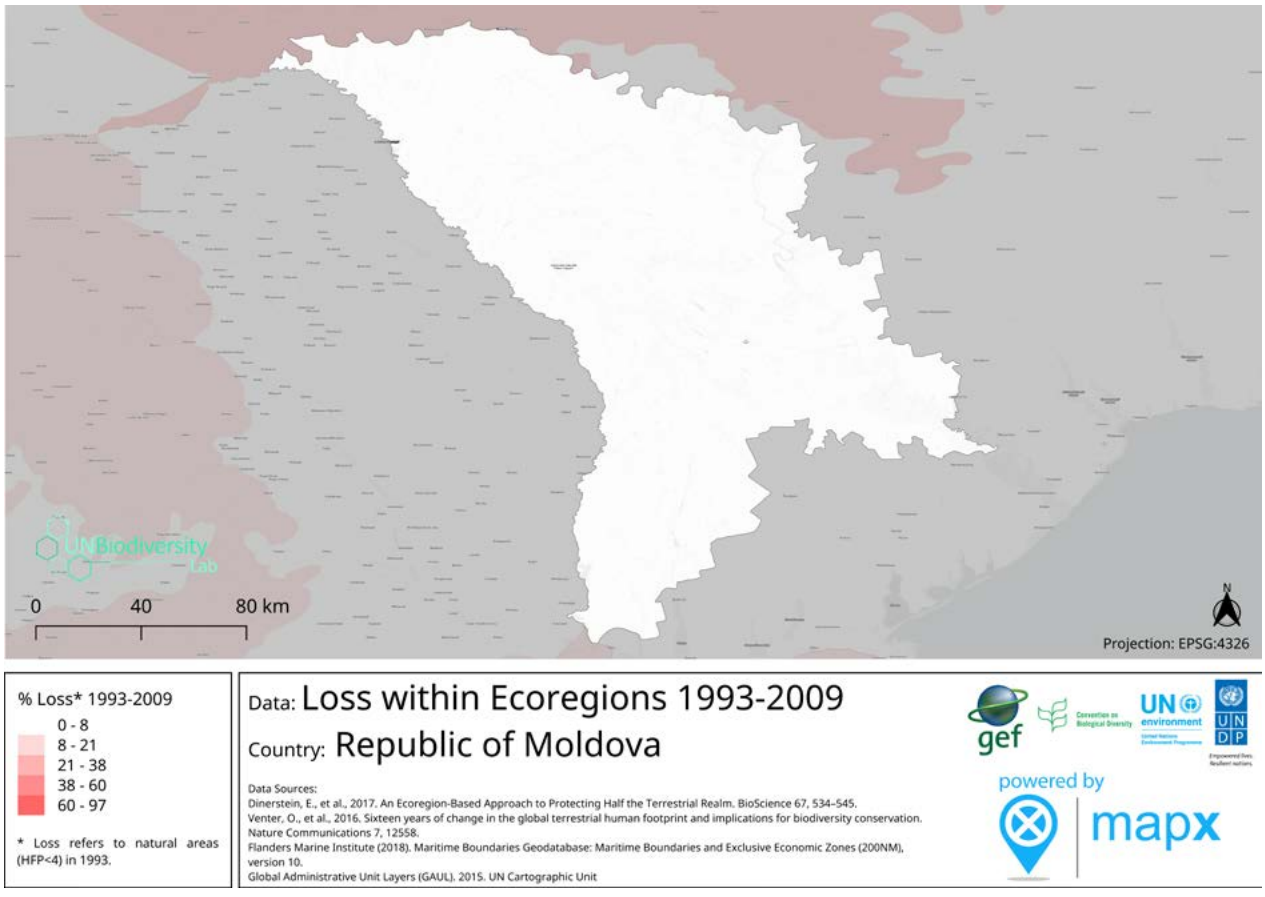


Figure 7. The rate of loss of biodiversity in Moldova

Target 6. Sustainable fisheries

In general, the Republic of Moldova's aquatic fauna is determined by the Nistru and Prut rivers basins. Nistru river, being a transit river, has a fluctuating capacity of aquatic species, for example, the ichthyofauna ranges between 46 and 94 taxa as it is stated by most scientific sources.

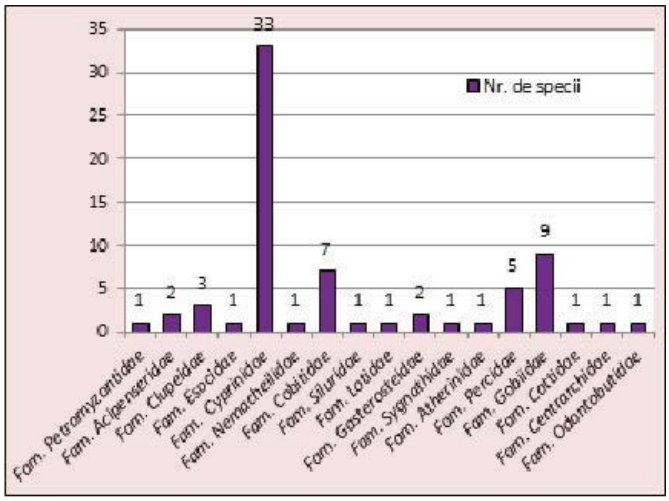
In the Republic of Moldova water resources are limited to about 1.32 billion m3, the hydrographic network is formed by 3,621 water courses with a total length of approx. 16 thousand km. The Nistru (630 km) and Prut (695 km) rivers mark the state border with Ukraine and Romania. In the country on all rivers are built more than 4.7 thousand accumulations of water with an area of approx. 48 thousand ha, of which only 34 are at the balance of "Apele Moldovei" Agency.

At present, the total area of water basins used for fish farming in the Republic of Moldova is 20,507 ha. Freshwater fish and its products are placed to the market, with a small ammount (0.3% – 1.7%) being catches in natural water basins. The total average annual fishery production in the period of 2011–2017 constitute – 32t. The quantity of native fish has increased at 1.7 times in the last 10 years and currently constitutes 10,668 tons or 25% of the value of the entire fishery production in the country. To obtain this volume of fish, 1,000–1,200 tons of fry material per year is produced. At the same time, the potential of the existing areas and genetic fund allows to obtain in the next 10–12 years 25,000 tons of native fish, which represents 50% of the total value of fish consumed. For this volume, 2,000–2,400 tons of fish stock is needed.

Valuable economic allogeneic species deliberately transported in the waters of the Republic of Moldova, measures have been taken to increase the fish productivity by introducing over 15 species of Asian and North American fish, belonging to 6 families and 10 genres: Coregonus peled, Coregonus maraenoides, Coregonus albula; Acipenser Baeri; Hypophthalmichthys molitrix, Hypophthalmichthys nobilis and Ctenopharyngodon idella; Mylopharyngodon piceus; Ictiobus cyprinellus, Ictiobus bubalus and Ictiobus niger; Ictalurus punctatus; Polyodon spathula. Liza haematocheilus, Clarias gariepinus and Oncorhyncus mykiss – are relatively new objects of native aquaculture.

In nowadays only three are cultivated extensively in the fishery: Cyprinus carpio, Cyprinus, viridiviolaceus, Cyprinus carpio haematopterus.

The fish biodiversity in Nistru River (in years 2006-2018) consist from the recorded 75 taxa of 11 orders and 18 families: Petromyzontidae (1 sp.), Acipenseridae (2 sp.), Clupeidae (3 sp.), Esocidae (1 sp.), Umbridae (1 sp.), Cyprinidae (35 sp.), Nemacheilidae (1 sp.), Cobitidae (7 sp.), Siluridae (1 sp.), Lotidae (1 sp.), Gasterosteidae, Sygnathidae (1 sp.), Atherinidae (1 sp.), Percidae (5 sp.), Gobiidae (9 sp.), Centrarchidae (1 sp.), Odontobutidae (1 sp.), Cottidae fl. Fig. 8. At pesent, in this sector the fish representatives of the Ponto-Caspic fresh water, Ponto-Caspic marin and boreal medow ihtiocomplexes are dominated.



The composition of ihtiofaune fl. Nistru, 2006-2017, territorial limits of the Republic of Moldova

Figure 8. Ichtyofauna Nistru r.

During the years 2010–2018, investigations made in Prut river recorded species of pythyofaunistic diversity of 56 fish species, attributed to 10 orders and 15 families: Order Petromyzontiformes, fam. Petromyzontidae (1

sp.) Order Acipenseriformes, fam. Acipenseridae (1 sp.); Order Clupeiformes, fam. Clupeidae (1 sp.); Order Esociformes, fam. Esocidae (1 sp.); Order Cypriniformes, fam. Cyprinidae (27 sp.), Fam. Nemacheilidae (1 sp.), Fam. Cobitidae (5 sp.); Order Siluriformes, fam. Siluridae (1 sp.); Ord. Gadiformes, fam. Lotidae (1 sp.); Ord. Gasterosteiformes, fam. Gasterosteidae (2 sp.); Order Sygnathiformes, fam. Sygnathidae (1 sp.); Ord. Perciformes, fam. Percidae (6 sp.), Fam. Gobiidae (5 sp.), Fam. Centrarchidae (1 sp.), Fam. Odontobutidae (1 sp.). Fig. 9.

According to the Annual reports of the State Fisheries Service, a significant decrease of quantity of fish in Prut river has been reported. In the largest accumulation lakes Costesti-Stânca (Prut river) and Dubasari (Nistru river), the fishery production is below its potential capacities.

The composition of the Prist r., the territorial limits of the Republic of Moldova, 2010-2016

Figure 9. Ichtyofauna Prut r.

Causes of changes

The degradation of the fish stock in the natural ecosystems of the Republic of Moldova is influenced by several anthropogenic factors which have greatly changed the conditions of reproduction, development and nutrition of fish: (i) water flow regulation through construction of Dubasari Dam (1956), Novodnestrovsc 1981) at the Nistru river, and Costesti-Stânca (1976) at Prut river; (ii) drainage of pools from the floodplain of Nistru and Prut; (iii) lack of measures for fishery management improving (iv) hydro- energetic activities prevail over protection of natural ecosystems, (v) extracting sand from Nistru and Prut rivers; (vi) use of water for agricultural, industrial and household purposes; (vii) pollution from pesticides, herbicides and other substances used in agriculture; (viii) poor exploitation of fisheries resources, illicit and industrial fishing, etc.

Fishery regulation

Fishery is regulated by the Law on Fish Fund, Fishing and Fish Farming (No. 149 of 08.06.2006) *http://lex.justice.md/document_rom.php?id=68F56F6D*:8E74D2B2, which cover the amateur, sporting, industrial and scientific fishing in natural water ecosystems. In general, the law establishes a series of measures for the protection of aquatic biological resources in natural fisheries, such as (i) actions to ensure the sustainable use of the fish fund and conservation of aquatic biological diversity, (ii) annual prohibition of fishing, (iii) contraventions etc. It also regulates the process of fish breeding in the natural fishery. The central environmental authority approves the annual fishing quotas.

In the period of 2008- 2014 the fishing amount has fluctuated from 2,700kg to 4,100 kg. In 2015 the Environmental Authority has not approved fishing quotas for the years 2015–2018, so the industrial fishing has been prohibited. Fig. 10.

Actions to improve management and fish restoration

The Biological Diversity Strategy of the Republic of Moldova for the years for 2015–2020 in its Action Plan clearly establishes the following commitments: (i) implementation of the Agreement between the Government of the Republic of Moldova and the Government of Romania on cooperation for the

protection and sustainable use of Prut and Danube waters; Agreement between the Government of the Republic of Moldova and the Cabinet of Ministers of Ukraine on cooperation in the field of protection and sustainable use of the Nistru River basin, (iii) ensuring measures to minimize the degradation of water resources and aquatic biological diversity, (iv) developing management plans, (v) identifying and delimiting water bodies, (vi) restoring riparian strips of water protection to rivers and water basins, etc.

The following regulation are setting the legal normative framework for actions to protect aquatic biodiversity resources: Law on Fish Fund, Fishing and Fish Farming (no. 149 of 08.06.2006), has been amended, Water Law (No. 272 of 23.12.2011, Law on the Environment Protection (no. 1515-XII of 16 May 1993), Law on Natural Resources (no. 1102 of 06.02.1997), Law on Water Basins and Waters Protection Areas and Strips (no. 440 of April 27, 1995), Law on Animal Kingdom (No. 439-XIII of April 27, 1995), Law on Red Book (no. 325 of December 15, 2005), Contravention Code of the Republic of Moldova (no. 218 of 24.10.2008)), Government Decision on the authorization of fishing in the natural aquatic basins (no. 888 of 06.08.2007), and also 2 regulations – the Fisheries Service Regulation, and the Regulation on Public Access to Environmental Information.

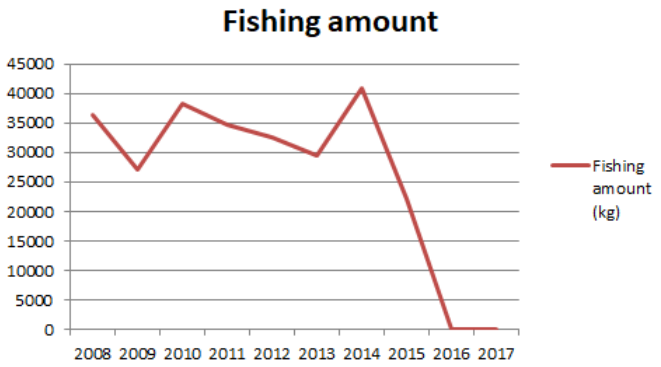


Figure 10. The authorized fish in the Republic of Moldova

Sustainable Development Goals

The Moldovan efforts and activities to fulfill the ABT 6 are in line and meeting to achieve the SDG 1 and SDG 12. By 2030 to ensure equal rights to access the economic resources and services, provided by the natural resources, reduce vulnerability to climate change, ensure sustainable consumption and production by efficient use of natural resources.

The Dniester river at Slobozia Vărăncău village.

Target 7. Areas under sustainable management

To meet the global energy, environmental and sustainable development challenges, the Government of the Republic of Moldova committed itself to implementing the environmental tax reform, reforming with the support of the GEF/UNDP project "Environmental Fiscal Reform", 2012–2015, aimed at strengthening the environmental authority's capacity to improve the existing legal and regulatory framework in the field of pollution taxes, promoting green technologies and improved subsidies in energy and agriculture, which have a positive effect on agents economics and the population in general.

http://www.md.undp.org/content/moldova/en/home/operations/projects/climate_environment_energy/proiecte-finalizate/environmental-fiscal-reform-.html

The project has helped to adjust the management and operational practices of the National Ecological Fund to the best standards in Central and Western Europe to ensure the sustainable development and implementation of environmental protection policies.

Agriculture

Agriculture has an important socio-economic role in the development of the Republic of Moldova. This sector produces about 12% of GDP, employing over 30% of all those working in the national economy. The income of the majority of the rural population, which accounts for about 60% of the country's population, depends predominantly on the results of the activities in the agrarian sector. The agricultural sector involves the largest territorial coverage of 74.9% (about 1,500 thousand ha) and about 411 th. persons or 33,7% of population of the country. The value of the provisioning service food for the ecosystems in agriculture is estimated at around $ 21,900.6 million in 2011. Fig. 11.

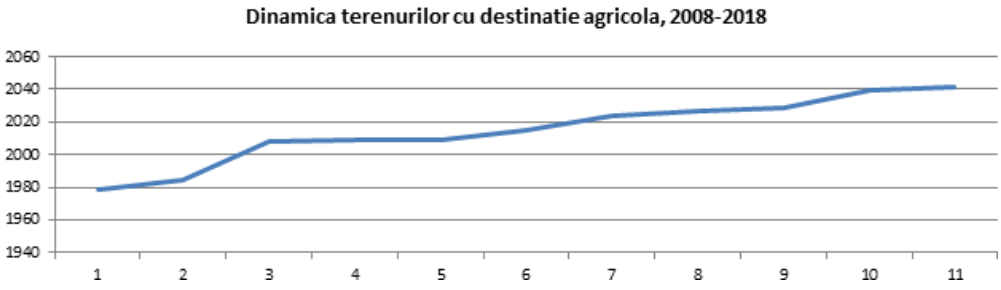


Figure 11. Dynamics of agricultural land of the R. Moldova

The agricultural practices in Moldova have a structure for distribution of cultivated lands as following: annual crops on arable land 53.6%), perennial plantations (8.8%), orchards (3.9%), vII (4.4%), pasture and hay (10.5%), fallow (0.9%). From these, 6.3% of arable land and 0.4% of multi-annual plantations are irrigated.

In 2017 the cultivated crops are the following: cereals – 3,285,800t (corn, wheat, barley), industrial crops – 803,800t (sunflower), leguminous crops 69.0 th.t, and vegetables – 309,500t, potato – 197.0 th.t, and the fruits – 636,200t (apples, berries) grapes – 675,100t (technical varieties, table). This raw material support food industry in the country, including bakery industry, canned food, wine, etc.

The livestock sector produces annually (2017) 152.9 th.t of meat (poultry, pig, beef, other), milk – 485.2 th.t, eggs – 707.2 mln. pcs, which are used by national food industry for domestic and export purposes. The illegal pasture cases reordered of 1,273, and the estimated damage of 206.9 th.lei.

Natural fertilizers (40,982 th.t) used in agriculture are decreasing compared to the previous years and chemical fertilizers (65,6 th.t) are increased. Thus the total 69,06 kg of chemical fertilizers and 50 kg natural fertilizers (2017) are used for one hectare of agriculture land.

http://madrm.gov.md/sites/default/files/Raport%20SNDAR%202017.pdf.

In recent years, a substantial increase in local private investment in agriculture there has been achieved (about 2.5 times, from 796 million lei to 1,764.5 million lei), but also a decrease in the agriculture public sector has been recorded.

Stimulating private investment in high added-value agricultural sectors, promoting organic farming and bio-products would help to improve their efficiency and reduce the anthropogenic pressure on adjacent natural lands and their biodiversity. In 2016 the total number of 39 agriculture producers has been registered as the organics farmers to practice organic farming at the territory of 1,072.88ha.

According to the Agency for Agricultural Intervention and Payments data, in 2016 the total number of 4,549 of requests for subsidies received 641,1 million lei. In 2017 the 7,800 requests for subsidies of 3,612 agricultural producers received in total 800,0 million lei.

http://aipa.gov.md/en/masuri-de-sprijin

According the G. D. No. 1157 of 13.10.2008 on approval of the Technical Regulation "Soil protection measures in agricultural practices" the following measures have been developed:

- pollutants extracting crops;
- reducing the impact of pollutants by restoring degraded lands;
- storage of polluting substances in open landfills, prohibition of storage facilities for plant protection and fertilizer in the areas at risk of landslides, erosion, flooding etc.

Good agriculture practices

In the period of 2014-2017:

- The area of consolidated land is 940 thousand hectares.
- 10 centralized irrigation systems were rehabilitated on the territory of 12,354 ha.
- 122 additional farmers used irrigation on agricultural holdings, and irrigated area on agricultural holdings on the territory of 29,360.31 hectares.
- About 1,000 agricultural producers have irrigation systems, including sprinkling, micro-sprinkling – 500 units, dripping – 600 units and radicular – 1,140 units.
- 300 farmers use No-till/Mini-till technologies and 144,219 ha (58% more than in 2016).
- Sustainable land management sustainable land management on the territory of 14,304 ha.
- Technical advice to 65 municipalities in the planning and rehabilitation of forest protection strips of agricultural fields.
- Transfer of technologies: 799 new highly productive plant varieties resistant to unfavorable environmental conditions, were introduced in the Register of Plant Varieties and Hybrids of the Republic of Moldova in 2014–2017.
- 104 agricultural producers applied for agricultural subsidies for a total area of 8,101 ha.
- The area of agricultural land cultivated under No-till/Mini-till technology is about 84 thousand hectares. This increase is mainly due to the subsidy allocated to the agricultural technique procurement and implementation of programs through IFAD and 2KR projects. To subsidize the No-till/Mini-till equipment, 113 applications were registered for a total of about 16 million lei. *http://ifad.md/en/*

The biological methods for plant protection were used in agriculture in 2011 – 5.46t and slightly increased in 2015 to 5.89t.

Intelligent solutions – from conventional agriculture to conservative agriculture.

http://www.capmu.md/2018/01/solutii-inteligente-pentru-performanta-de-la-agricultura-conventiona-la-la-agricultura-conservativa/

No-Till

- SRL “Agro-SZM” s. Maramonovca, Drochia-10800 ha
- SRL “Agroelit” s. Târnova, Donduseni – mixed soil processing system (strip-Till, mini-Till-3911 ha)
- SRL “Hiliutanul” s. Hiliuți, Râşcani – (No-Till, mini-Till-100 ha)
- SRL “Pârjotei Valley” Pârjota, Râşcani – 500 ha, No-Till
- SRL “Agro-Popuros” s. Mărăndeni, Falesti –870 ha-mini-Till.

Organic farming

Organic farming in the Republic of Moldova is supported by important national legislation:

- The National Strategy for Agricultural and Rural Development for 2014–2020 (G. D. nr 409 of 4.06.2014);
- Law on Organic Agro-Food Production (No. 115-XVI of 09.06.2005),

http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=312917

- The National Concept of Organic Agriculture, Manufacturing and the marketing of environmentally and non-modified genetically food, GD No. 863of 21.08.2000

http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=305195

- The National Program on Organic Agro-Food Production (G. D. no. 149 of 10.02.2006)

http://lex.justice.md/md/327537/

- Regulation on methods and principles of agro production organic regulations,
- Regulation on the organic agro-food production inspection and certification system, the Rules on the import and export of organic agro-food products,
- Rules on the import and export of organic agro-food products.

The Practical Guide to Organic Farming (Field Cultures) published with the support of the International Eco-TIRAS River Keepers Association, following the need for ecologic and social modernization of sustainable farming system.

https://eco-tiras.org/books/Ro-2.pdf

Greenning agriculture

The International Development Alternatives NGO in the framework of the project “Strengthening the capacity to implement environmental tax reform to achieve national and global ecological priorities” has carried out the study “Greening of agriculture in the Republic of Moldova” aimed at the public interested in the ways of developing ecological agriculture in the country. The study includes information on greening agriculture through ecosystem approach, organic farming in the Republic of Moldova and measures needed to boost the development of organic farming.

Good practices have been implemented with the support of the project “Soil Conservation in Moldova” (2002-20022) implemented by the Institute for Forestry and Management

http://icas.com.md/activitati-2/proiecte-internationale-in-derulare/

In the period 2014–2017, following the implementation of Sub-component 3.3: Support for rehabilitation of protection strips, of the project “Competitive Agriculture in Moldova”, the total area of rehabilitation works was amounted to 2,241.8 ha, protected the total area of about 60,000 hectares. The rehabilitation of the respective forest curtains will have a beneficial influence on the neighboring agricultural lands.

http://www.capmu.md/wp-content/uploads/2018/02/Raport_2017MACP_-final.pdf

A total of 11 digital maps were developed at the 1: 5000 scales for Cigârleni, Ialoveni district on: soil types and subtypes, eroded soils, landslides and ravines, salty soils and hydro-morphes, land infrastructure, digital relief model, slope gradient. The maps will be used to identify and evaluate the main forms of soil degradation, to assess their degree of occurrence, to develop measures to stop and combat them, to improve the ecological situation in the Ialoveni district. The results of the works and recommendations will be used in the elaboration of the projects for combating soil erosion, irrigation systems, setting up of fruit and wine plantations, forest strips. *http://www.asm.md/galerie/Institutul%20de%20Pedologie.pdf*

The Guide on Measures to adapt to climate change in agriculture, published under the project "Support to the National Process for Adaptation to Climate Change Adaptation in the Republic of Moldova", supported by Austrian Government in partnership with the Climate Change Office, Ministry of Environment.

https://issuu.com/oficiulschimbareaclimei/docs/osc_ghid__agricultura_2015? e=23361340/33079146.

The practical Guide on Sustainable Land Management was developed by a group of specialists contracted under the project "Competitive Agriculture in Moldova", developed by the Consolidated Unit for Implementation of Agricultural Projects, and financed by the World Bank.

http://www.capmu.md/wp-content/uploads/images/docs/Studies/Ghid%20pract.%20MDT%20-%20ACSA%202015.pdf

The National Program for Ensuring Ecological Security for 2007–2015, approved by the GD no. 304 of 17.03.2007, is focused to the improvement of harmless soil cultivation and fertilization technologies, agricultural land use methods.

http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=322356

The research project entitled "Evaluation and Implementation of the Microbiological Potential for Development of Sustainable Agriculture Technologies" (2011-2014) is developed by the Institute of Microbiology and Biotechnology. Qualitative and quantitative pedo-microbiological criteria have been developed for the estimation, monitoring and forecasting of arable soil status. *http://www.imb.asm.md/pages1-0-35-ro.htm*

For the first time in the Republic of Moldova, pedo-microbiological procedures have been developed to assess and predict the impact of arable and bioremediation technologies on soil quality. Effectiveness of fodder crops in the stable plant protein production and attenuation of arable soil degradation has been demonstrated. The National Collection of Non-pathogenic Microorganisms has supplemented its microbial genetic stock with 70 new biotechnological strains (with antimicrobial activity against phytopathogens, phytostimulators, nematicides, etc.).

The Agricultural Information System *https://www.cia.md/ro/geoportal-agricol.developed* by the Agricultural Information Center is set up to assist the Ministry of Agriculture, Rural Development and Environment, its subdivisions and the National Agency for Food Security in the process of identification, development and implementation of automated information systems that will allow re-engineering and digitization of public services provided in the agro-food and processing sector. The Agricultural Information System digital maps of contain information from the agricultural activities:

1. Agricultural enterprises;
2. Harvesting;
3. Crops distribution;
4. Harvesting of crops;
5. Livestock farms and flocks;
6. Map of Soils of the Republic of Moldova
7. Education and research institutions in the field of agriculture

Forestry

Forests are the richest ecosystems in Moldova in terms of biodiversity. Forestry has an important role in the national socio-economic development of the country. This sector produces about 0,4% of GDP. Moldova has relatively low cover of forest vegetation (appr. 450th. ha or 13,7% of country's territory), while forest cover is only 11% or 379,3th. ha. The total growing forestry fund is estimated at 46 million m3 representing an average of 124 m3/ha. The annual allowable cut (AAC) and the officially recorded actual harvest is around 400th – 500th. m3/per year. The annual allowable cut (AAC) in the forests administrated by Moldsilva is approximately 45% of the annual increment compared with a European average of 64%. Forest ecosystems have increased in recent years by 8 thousand ha, reaching 13.35% of the total land fund of Moldova; the national target is 15%. The hardwood forest cover 93.68% and the softwood forests have about 16.9 thousand ha. However, due to planting of acacia species (over 40% of the forests), the original composition of forest ecosystems has been modified. Fig. 12.

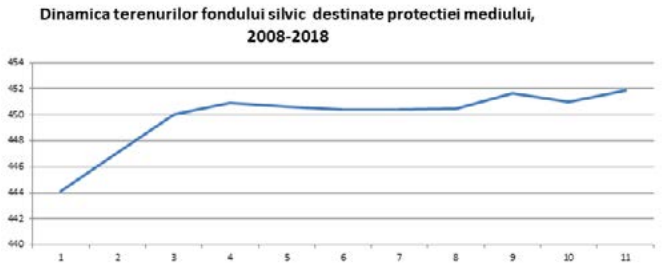


Figure 12. The dynamics of the forest fund R. Moldova

About 500 plant species are typical for forest habitats, 172 of which are rare and 103 are under state protection. There are about 40 species of relic plants in the forest ecosystems. There are total number of 172 of vertebrate terrestrial species live in the forest ecosystems, or 47,8% of the total number of vertebrate species of Moldova.

The national target of afforestation is 15%. In the recent years the forest fund increased by approx. 8.0 *th.ha* reaching 13.35% of the total territory of Moldova.

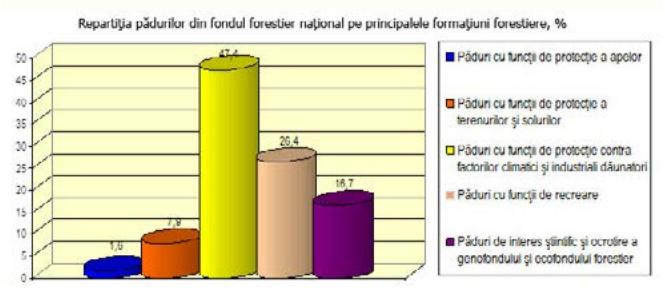


Figure 13. Distribution of the main forest formations,%

The forests have the following functions: scientific interest, water protection, recreational, climate change protection, soil and land protection. Fig. 13.

The forest regeneration measures in the State Forestry Fund have been provided annually approx. at 3–5 *th.ha* of forest. Extension of the state forestry fund has taken on approx. 100 ha annually.

In 2011–2017 the total volume of the illegal cutting has been registered 8,833 m3 and the damage estimated of 8,046.5 th.lei. The total number of registered cases is 5,112.

Measures to combatting the poaching is provided by the State Ecological Inspectorate and Moldsilva Forestry Agency. In 2017 the total number of detected poaching cases is 328, that constitute the total damage of 243,6 th.lei.

Few projects have contributed to the extension and sustainable management of the forest fund lately, including:

– The project "Soil Conservation in Moldova" supports the rehabilitation and conservation of soils by afforestation of 20.3 thousand hectares.

http://icas.com.md/activitati-2/projects-international-in-derulare/

- The project "Development of the communal forestry sector in Moldova", promoted by Moldsilva Forestry Agency in collaboration with the BioCarbon Fund, for the plantation of new communal forests on the area of 9,400 ha, by afforestation of eroded and non-productive land.
- Grant provided by the Government of Japan "Community Support Program for Sustainable and Integrated Forest Management and Carbon Seizure Management through Afforestation" of contribution for sustainable management of 1,453 ha of forests and 608 ha of meadows.

http://icas.com.md/activitati-2/proiecte-internationale-in-derulare/

- The ENPI-FLEG Program in Moldova developed recommendations for improvement of the existing Forest Code.

http://www.moldsilva.gov.md/pageview.php?l=en&idc=230&t=/Cooperation/ENPI-FLEGProgram

- The Guide "Sustainable Management of Forests and Meadow lands of the Local Public Authorities" was published, which provides guidance for good practices and lessons learned for sustainable restoration and management of communal forests and pastures. The UNDP / EU project "Clima-East: Sustainable Management of Grazing and Public Forests in the First National Park in Orhei to Demonstrate to Local Communities the Benefits and Advantages of Mitigation and Adaptation to Climate Change" was implemented during 2013–2016, and on the outcome of other similar projects.

http://www.md.undp.org/content/dam/moldova/docs/Publications/managementul%20padurilor.pdf

In the reporting period a number of activities have been undertaken in order to implement the NBSAP that contributed to sustainable forestry, in special among others: development of forestry and protected areas GIS mapping, Emerald Network database and GIS mapping, UN Biodiversity Lab maps and imagery, maintenance of forest management planning and maps, development of protected areas maps for Orhei National Park, creation of Centers of information in forestry issues etc. Please see the Implementation chapter: Specific Objective A, Direction 2, Specific Objective B, Direction 1, Specific Objective D, Direction 2.

The Map of Moldova's Forests developed by the Institute of Forestry and Management and is located on the site. *www.icas.com.md/map*

The Map of Natural Protected Areas developed by the Institute of Ecology and Geography and is located on the site: *http://www.ieg.asm.md/ro/node/133*

National Ecological Network of Moldova (NEN) has been developed by "Biotica" NGO and has the following functions:

a. preserving ecosystems, habitats, species and landscapes in a national, European region context, including by preserving and restoring territorial integrity and connections;
b. protecting and raising the quality of vital resources of vital importance for protected species;
c. raising the resistance of agrocenoses and their capacities for restoration due to the agro-ecological influence of NEN elements and better preservation of biological agents;

d development of the NEN of the biological monitoring system, solving environmental problems at the informational, scientific and practical level.

http://www.biotica-moldova.org/library/ECO-net_decision-makers-ro.pdf

The Emerald Network is an ecological network made up of Areas of Special Conservation Interest. Its implementation was launched by the Council of Europe as part of its work under the Bern Convention. The Emerald Network in Moldova consist of GIS maps and digital bounders on the following elements: Total Emerald sites – 52, Emerald habitats – 34; total Emerald species: 165 sp., including plant species – 14sp.; total animal species: 151 sp.: mammals – 14sp. birds – 89sp. reptiles – 2sp. amphibians – 3sp, fish – 19 sp. invertebrates – 24sp.

https://cdr.eionet.europa.eu/md/coltlvaya/coltlvabg/.

UN Biodiversity Lab MapX. The Moldovan Emerald Network map have been integrated into the UN Biodiversity MapX and is available for observation of dynamic of protected areas and vulnerable species and habitats under European protection for future decision making.

https://mvp.app.mapx.org/?project=MX-LW7-15O-8WC-NMS-GA0&language=en&zoom=6.639&lat=47.003000000000014&lng=30.47199999999998

Biodiversity Indicators Partnership for Moldova helps to evaluate the status of protection in the country, assessment of dynamics of factors influenced the state of biodiversity and provide support in the preparation of the 6th National Report to the CBD.

http://bipdashboard.natureserve.org/bip/SelectIndicator.html?iso=MDA&reg=Europe

Data Cube technology for Moldova has been developed with the support of the UNEP Grid Geneva and involve a pilot map platform of the territory of Moldova with connection to satellite imagery and spatial data processing methodology.

Regional Biogeographic Emerald Network process. Moldova has participated in the European Biogeographical seminars within the Emerald Network project to provide self-assessment of sufficiency of the identified Emerald sites for the endangered species and habitats under the protection of Bent Convention.

http://www.datacube.org.au/
https://www.coe.int/en/web/bern-convention/conclusions-of-the-biogeographical-seminars.

The State Ecological Inspectorate: fulfills the environmental data base on woter pollution and use, air pollution, flora and fauna use, waste management, soil and mineral resources, illegal use of natural resources. The data base and annual reports and digital maps are published on the website and available for decision making and large public.

http://ies.gov.md/harta-2/

Aquaculture

In the Republic of Moldova water resources are limited to about 1.32 billion m3, the hydrographic network is formed by 3,621 water courses with a total length of approx. 16 thousand km. The Nistru (630 km) and Prut (695 km) rivers mark the state border with Ukraine and Romania. In the country on all rivers are built more than 4.7 thousand accumulations of water with an area of approx. 48 thousand ha, of which only 34 are at the balance of "Apele Moldovei" Agency. At present, the total area of water basins used for fish farming in the Republic of Moldova is 20,507 ha. Fig. 14.

The ichtyofauna Republic of Moldova is very diverse as being formed by the Nistru River basin and the Danube River basin, including Prut river. Ihtyofauna includes endemic and relict species from the Danube, Nistru, and Nipru basins, Pontic and Mediterranean expansions, as well as alien species of Asian and North American origins. In different years ichtyofauna of the aquatic ecosystems of Republic of Moldova varies between 75 and 130 species.

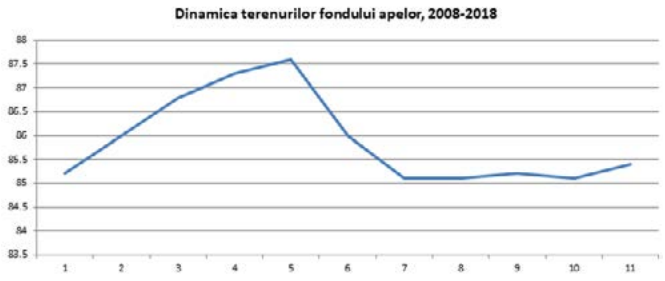


Figure 14. Dynamics of the water fund of the R. Moldova

The NBSAP involves a number of actions to be undertaken in order to support sustainable development of aquatic sector.

Since 2015, the Ministry of Environment has banned the industrial/commercial fishing in Prut and Nistru Rivers.

In 2014, the State Fishery Service developed a project on the construction of an aquaculture center of the Costesti-Stanca Lake on Prut River, aimed to reproduce native species of fish.

The two Aquatic basin district management plans have recently been developed for Nistru and Pru rivers basins:

The Nistru River Basin District Management Plan was approved by the Government Decision no. 814 of 17.10.2017 in order to ensure the protection and improvement of surface and underground water resources, the sustainable management of water resources within the Nistru river basin district.

(Http://lex. *justice.md/index.php?action=view&view=doc&lang=1&id=371992*)

The Government Decision on the approval of the Danube-Prut and Black Sea River Basin District Management Plan was drafted under the provisions of Art. 19 para. (1) of the Water Law no. 272 of 23.12.2011 (Official Gazette of the Republic of Moldova, 2012, No. 81, article 264). The aim of the Management Plan is to ensure the protection and improvement of surface water and groundwater resources, the sustainable management of water resources within the Danube-Prut river basin district and the Black Sea.

The water boundaries were identified by the "Apele Moldovei" Agency and included in the Management Plan for Danube-Prut river basin and the Black Sea and Nistru. The water boundaries delimitation is done by the Institute for Territorial Organization Design.

The NGO Biotica have planted about 60 ha in the wetland area Nistru de Jos within the project "Sustainability activities for the ecosystems in the Ramsar area" Nistrul de Jos ".

http://www.biotica-moldova.org/md/projects/ADA%20project.html.

The NGO REC-Moldova has restored some portions of the Ichel river, within the project "River Protection Strips – a measure of securing water as a result of the effects of climate change".

http://www.environment.md/projects/34-Fiile-de-protecie-a-rurilor--msur-de-securizare-a-apei-n--urma-efectelor-schimbrilor-climatice.html

Within the SDC/ADA project "Strengthening the institutional framework in the water supply and sanitation sector of the Republic of Moldova (2018-2019), the riparian protection strips along the reservoir lakes Ghidighici and Costesti-Stânca has been designed and the assessment of the environmental conditions of the given riversides provided.

http://www.amac.md/libview.php?l=ro&id=158&idc=15&t=/PRESA/Noutati//.

The Ministry of Agriculture, Regional Development and Environment and the UNDP (2018 -2019) has launched a project of the Swedish Government in which a Study on the current and future impacts of hydro-energetic constructions on the Nistru River will be developed. The project will provide with a new methodology for estimating potential damage to aquatic ecosystems, to be approved by the Government of the Republic of Moldova.

A feasibility study on the creation of artificial restoration center for valuable fish species in the village of Proscurini, Rîşcani district has been developed.

GIS Mapping of the aquatic wintering habitats for fish and their registering have been initiated by the Institute of Zoology and State Fishery Service.

A study on the current and future impacts of hydro-energetic constructions on the Nistru River has been initiated by the project supported by the Swedish Government.

The National Adaptation Strategy to Climate Change, approved in 2014 stipulates measures for drought prevention, floods and natural disaster mitigation.

In the period of 2014–2018 the State Ecological Inspection and State Fish Service undertaken measures to prevent and combat the Illegal fishing. In 2011–2017 the damage from the illegal fishing was about 1,323 th.lei and the total number of illegal fishing cases recorded to 9,273, the fines of 3,785.5 th.lei have been applied.

The State Hydrometeorological Service carries out research in the field of hydrometeorology and monitoring on the quality of the status of environmental in order to provide methodological and scientific support to decision making in the field of environment. It performs works in the field of processing and interpretation of meteorological, hydrological and environmental information and monitoring in the field of geographic information systems.

http://www.meteo.md/index.php/calitatea-mediului/.

The Apele Moldovei Agency has maintaining the national database on hydrographic basin, water and sanitation, GIS Map on Hydrographic Basins and Districts of Hydrographic Basins:

http://www.apelemoldovei.gov.md/pageview.php?l=ro&idc=134&
http://www.apelemoldovei.gov.md/pageview.php?l=ro&idc=134&id=439

The State Ecological Inspectorate: fulfills the environmental data base on woter pollution and use, air pollution, flora and fauna use, waste management, soil and mineral resources, illegal use of natural resources. The data base and annual reports and digital maps are published on the website and available for decision making and large public.

http://ies.gov.md/harta-2/

Information of implementation of the National Biodiversity Targets under the NBSAP in regards to the sustainable aquaculture is provided in the Chapter II Implementation, Specific Objective C, Direction 2.

Sustainable Development Goals

The actions undertaken under the ABT 7 contributed to achieve the SDG 1 and SDG 2 goals to ensure by 2030 equal access to economic resources, natural resources and services that will reduce poverty and increase well-being by ensuring sustainable food production and implement resilient agricultural practicies. The Adaptation of the main ecosystems to climate change, extrem weather drought and flooding will improve soil quality.

Nistru river at Vărăncău village

Target 8. Pollution

The rate of the primary energy resources, about 70%, is consumed to obtain electrical and thermal energy. Other important direct users of energy resources are transport (about 15%), industry (7%) and agricultural sector (3%).

Air Pollution

From the main power units, the most polluting are the electro-thermal power stations. Their impact on the environment is determined by the type of the fuel used. The pollution is substantially increases in case when the Thermal Power Plants (CHP-1 and CHP-2, CHP Nord Balt) consume coal, and less polluting fuel is oil, or natural gas as and have a relatively low impact on the environment.

The car transport, the railway transport and the air transport have the most important role in the economy of the country: car transport is about 88%, 11% -railway transport and only 1% of the other types of transport, including the air transport. The most important pollutants resulting from these processes are: carbon oxides, sulfur, nitrogen, suspended particles, formaldehyde, benz (a) pyrene, etc. An important source of air pollution remains, however, the burning of fuel. The air is polluted significant by impurities presented in the fuels, in smoke or nitrogen and sulfur oxides.

According to the 1990–2015 *National Inventory Report on Climate Change*, the total nitrogen oxides emissions have been reduced by about 68.5%: from 137.1930 th.t in 1990 to 43.2178 th.t in 2015; total carbon monoxide emissions declined by about 61.5%: from 439.0588 th. t in 1990 to 169.0056 th. t. in 2015; emissions of non-methane volatile organic compounds decreased by about 61.6%: from 183.0223 th. t in 1990 to 70.3063 th. t in 2015; and sulfur dioxide emissions decreased by about 92.6%: from 294.2491 th. t in 1990 to 21.8899 th. t in 2015. Fig. 15.

The *State Hydrometeorological Service (SHS)*, carries out systematic monitoring of air quality and pollution, radioactive pollution on the territory of the Republic of Moldova

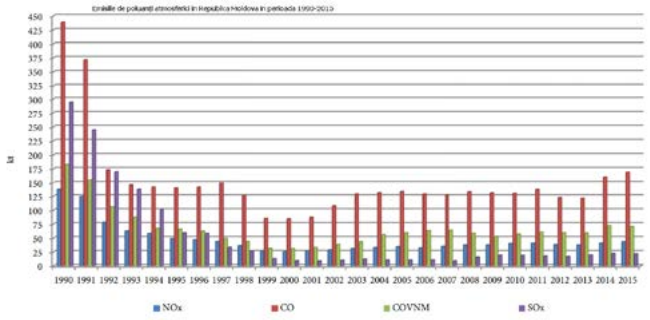


Figure 15. Atmospheric pollutant emissions in the Republic of Moldova

Water pollution

The State Hydrometeorological Service (SHS), carries out systematic monitoring of the status surface water, on the territory of the Republic of Moldova in accordance with the *to the Regulation on monitoring and systematically survaying the status of surface waters and groundwater,* GD no. 932 of 20.11.2013 (published on 29.11.2013 in OJ No. 276–280, art. 1038.

According to the monitoring data, during the period 2013–2015, the pollution level of the Prut river, Nistru river and Danube river did not changed significantly compared to previous years. Fig. 16 and Fig 17. These rivers are considered to be moderately polluted, which corresponds to class III “moderately polluted” and “polluted” class IV, which is due in particular to biogenic elements, copper compounds, phenols, and petroleum products.

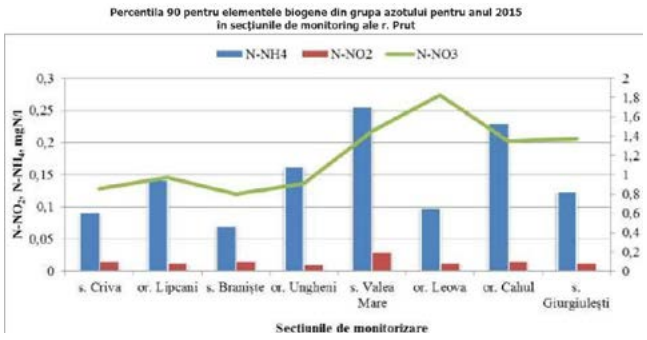


Figure 16. Degree of water pollution of the Prut r.

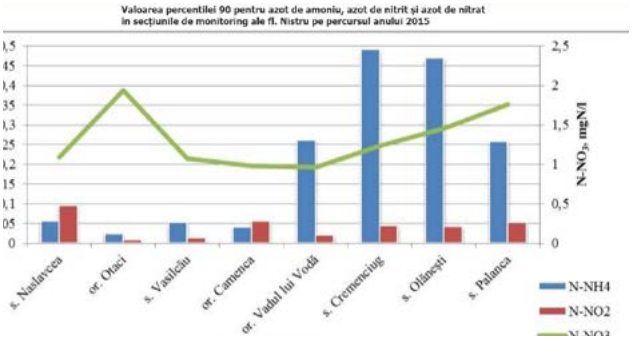


Figure 17. Degree of water pollution Nistru r.

The quality of water in small rivers during this period of 2013–2015 was characterized by a high degree of pollution with ammonium ions, nitrites, copper compounds, overall mineralization, as well as low level of dissolved oxygen in water.

Industrial pollution

The Republic of Moldova signed the *Minamata Convention on Mercury* in 2013. The *National Inventory of Mercury Emissions in the Republic of Moldova* was developed during in 2016, by the *Environment Prevention Office at the Ministry of Environment* of the Republic of Moldova under the GEF / UNEP project *"Evaluation Initial Implementation of the Mineral Convention on Mercury in the Republic of Moldova "*.

Pollution in Agriculture

Pollution in agriculture consists in the use of a broad spectrum of insecticides, fungicides, herbicides and fertilizers. In 2010–2017 the insecticides were used from 1.3 kg/ha to 1.2 kg/ha, (total from 256.6 t to 404,1t), fungicides -from 3.2 kg/ha to 2.5 kg/ha (total from 683.3 t to 1110 t), herbicide – from 2.1 kg /ha to 1.7 kg/ha (total from 1030 t to 1384.9 t), biological plant protection products increased significantly: from 37.6 t in 2010 to 783.8 t in 2017.

The Uze of Plant Rotection Products in Aricultural Entreprises and Farms in Moldova in the period of 2010–2017 is presented in the Table 1. (Statistic Bureau of Modova).

Tabl. 1. Use of plant rotection products in aricultural entreprises and farms

Insecticides	2010	2011	2012	2013	2014	2015	2016	2017
Quality (physical weight), tonnes	256.6	307.6	318.6	347.2	342.0	296.8	349.3	404.1
Protected area, thou.ha	194.2	192.0	187.6	229.2	243.1	238.2	277.0	336.6
Uzed per 1 ha, kg	1.3	1.6	1.7	1.5	1.4	1.3	1.3	1.2
Chemical fertilizers								
Qualitity (physical weight), tonnes	683.3	787.1	805.2	902.2	940.3	811.3	1132.0	1110.0
Protected area, thou.ha	215.2	224.9	235.5	291.1	350.6	337.7	411.1	449.8
Uzed per 1 ha, kg	3.2	3.5	3.4	3.1	2.7	2.4	2.8	2.5
Herbicides								
Qualitity (physical weight), tonnes	1030.0	1373.2	1599.2	1543.6	1554.5	1371.1	1460.0	1384.9
Protected area, thou.ha	486.1	560.3	653.5	703.3	784.7	760.2	752.2	810.1
Uzed per 1 ha, kg	2.1	2.5	2.5	2.2	2.0	1.8	1.9	1.7
Biological								
Qualitity (physical weight), tonnes	37.6	40.7	36.5	83.1	99.8	80.1	439.8	783.8

Insecticides	2010	2011	2012	2013	2014	2015	2016	2017
Protected area, thou.ha	11.6	13.9	18.8	15.3	17.8	30.9	33.8	48.2
Uzed per 1 ha, kg	3.3	2.9	1.9	5.5	5.6	2.6	13.0	16.2
Other								
Qualitity (physical weight), tonnes	34.4	91.0	230.8	243.8	241.6	244.5	286.9	398.1
Protected area, thou.ha	46.2	78.3	86.0	96.4	136.1	141.5	179.6	198.7
Uzed per 1 ha, kg	0.8	1.2	2.7	2.5	1.8	1.7	1.6	2.0

Nutrients

Reduced application of mineral fertilizers has led to improved conditions for fauna and flora in the agricultural ecosystems, however lead to the reducing of humus presence in the soil. Although 150 kg/ha of NPK active substance and 5 t/ha of manure were introduced into agricultural soil, the balance of nutrients was negative for nitrogen and potassium and balanced with phosphorus. Annually, about 60 – 70 kg/ha of nitrogen, 30–40 kg/ha of phosphorus and 70 – 80 kg/ha of potassium are exported from the soil with the agricultural harvest.

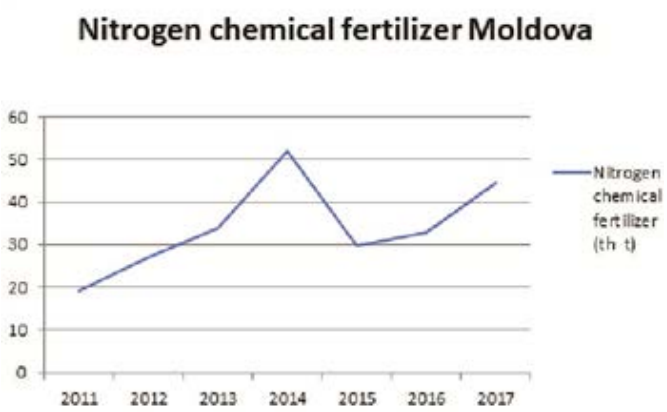


Figure 18. Nitrogen chemical fertilizer Moldova

In 2011–2017 the total amount of nitrogen introduced in the soil was 19.2–44,3th. t, phosphates – 2.9–15.9 th.t, potassium – 1.5 – 5.4 th.t. The Natural fertilizers introduced in the agricultural lands – 29.2–41.0 th.t. (*National Bureau of Statistics*). The dinamic of Nitrogen Chemical Fertilizer level in Moldova in the period of 2011–2017 is presented in the Fig. 18. (Statictic Bureau of Moldova).

POPs and chemical waste

An important role in reducing environmental pollution is the liquidation of pesticide residues and chemical waste, including persistent organic pollutants accumulated since the Soviet period:

- 360 tons of pesticides, discharged and destroyed in 2017, 660 tons – in 2018;
- 1,600 decontaminated storages until 2019, 350 ha of land restored by 2019.

Ecotoxicology

The Laboratory of Hydrobiology and Ecotoxicology of the Institute of Zoology provide research activity on the Structure and functioning of hydrobionts communities, quantification of eco-toxically biotransformation and self-purification processes in natural and anthropic aquatic ecosystems, development of ways to restore their ecological status.

The Center for Ecological Chemistry and Environmental Protection of the Institute of Chemistry carries out the following activities:

- Study of the migration, accumulation and transformation processes of heavy metals, pesticides, polychlorinated biphenyls (PCBs), polyaromatic hydrocarbons (PAHs) and other organic pollutants in environmental objects: natural and residual waters, soils, sedimentary sediments, rocks, plants and agricultural products;

– Developing recommendations for reducing the impact of pollution with elements and toxic compounds on the quality of the environment, agricultural products and population health.

Radiological pollution

According to the *National Agency for Regulation of Nuclear and Radiological Activities*, the negative effects on ecosystem services have been observed during the radioactive monitoring on polluted by Chernobyl accident territories in Brest region (Luninets) of the Republic of Belarus. Contamination of water, soils, and wild food supplies at the territory of the Republic of Moldova were observed long time after accident on many spots. Measured radioactive contamination levels in many samples of mushrooms and berries (actively used by local population as forest food products) was 53,000 to 230,000 Bq/kg being caused mostly by Cs-137 and Sr-90. It leaded to high level of contamination of some local people (contamination measurement of 2,850 people with Cs-137 was performed). *http://www.anranr.gov.md/en*. Migration of radionuclides from soil to grass and subsequently to milk was observed in a number of cases. Coming from above-mentioned and the fact of migration of wild animals and birds as well as import of foodstuff and building materials an assessment of risks coming from nuclear and radiological accidents was considered to be considered in present study. In order to prevent introduction of polluted with radionuclides agricultural and animal products into the territory of Moldova, an effective system of radiation control at the border crossing points has been established. All major border crossing points were equipped with portal detectors for vehicles, trains, goods and pedestrians in order to prevent transboundary movement of polluted with radionuclides foodstuff and other goods and materials. An automatic system of radiological remote control has been placed in 5 regions of the country being managed by the State hydro –meteorological service. Fig. 19.

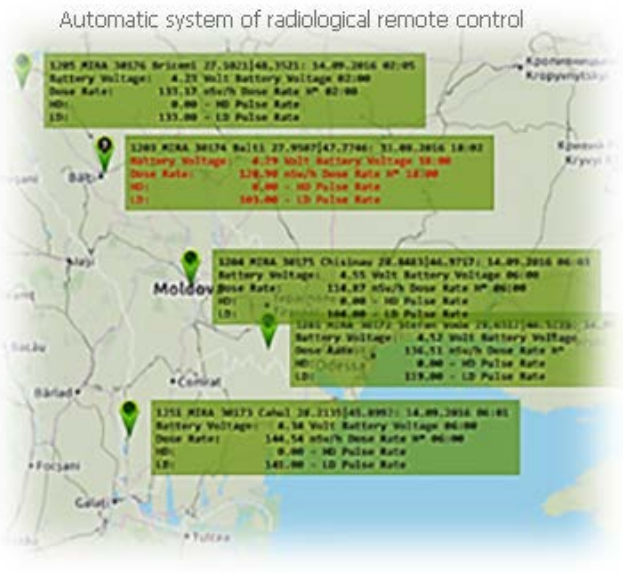


Figure 19. Location of radiological control systems R. Moldova

. The *National Strategy on Radioactive Wastes Management and Action Plan for its implementation for 2016–2027* was adopted by the Parliament of the Republic of Moldova (Law nr. 68 from 13.04.2017. It was harmonized with other legal national acts, including the *National Biodiversity Strategy and Action Plan for 2015–2020*.

A radiological control lab for agro-industrial complex of the Republic of Moldova was created within the *Institute of Soil Science "N. Dimo" of the Ministry of Agriculture, Regional Development and Environment*. It continuously monitors radioactive contamination of soils, plants and agricultural products on special research program.

As a conclusion it is to be mentioned that no significant impact or radioactive pollution on Moldovan biodiversity is observed.

Actions taken:

– *The National Residual Monitoring Plan* was developed according to the Government Decision no. 298 of 2011 *http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=338641*

– The *Laboratory for the determination of pesticide residues* was created.

Actions to be taken:

- Draft of the National Program for the Production of the Meat Sector
- Draft National Program for Development of the Milk Sector in the Republic of Moldova
- Draft National Program for the Conservation of Animal Genetic Resources
- Draft National Program for the Development of the Aquaculture Sector.
- Draft Program for Development of Conservative Agriculture
- The National Beekeeping Development Program for the period 2018–2025
- Draft Horticulture Development Program in the Republic of Moldova for the years 2017–2020
- The Wine Development Program Draft

Pollution control is carried out by:

State Hydrometeorological Service – *http://www.meteo.md/index.php/en*

National Agency for Regulation of Nuclear and Radiological Activities – *http://www.anranr.gov.md/en*

State Ecological Inspectorate – *http://ies.gov.md/*

National Agency for Food Safety – *http://www.ansa.gov.md/en*

Agency for Regulation of Nuclear and Radiological Activities – *http://www.anranr.gov.md/en*

National Agency for Public Health – *https://msmps.gov.md/*

Institute of Ecology and Geography – *http://www.ieg.asm.md/en*

Institute of Soil Sciences, Agro chemistry and Soil Protection – *http://www.ipaps.md/home/*

Institute of Chemistry – http://chem.*asm.md/ and its Center for Ecological Chemistry and Environmental Protection http://chem.asm.md/ccmca*

Institute of Zoology – *http://www.zoology.asm.md/category-20-0-0-ro.htm*

Sustainable Development Goals

The activities under the ABT 8 have an important role to achievement of the global SDG goals, in particular to the SDG 6, 12 and 14 by reducing illnesses from hasardous chemicals and air, water and soil pollution and contaminations, achieve sustainable management of natural resources, reduce nutrient pollution.

Target 9. Invasive Alien Species

The invasive alien species in Moldova represent an important challenge for the biodiversity conservation. However by present there are not sufficient legal and administrative measures are being developed and in place. A number of measures to combat invasive alien species have been undertaken during the last years. To be mention, no any legal provisions approved by present to ensure preventive measures or combating negative impact of invasive species to the natural ecosystems. The Phyto-sanitary quarantine Control system is in place to provide plant protection measures in the country.

Measures to combat invasive species

The NBSAP for 2015–2020, Direction of action 3. Ensure measures to mitigate the negative impact of invasive species, provides needs undertake the following measures:

- Elaborate and implement the plan of measures on invasive species in line with the requirements of the Bern Convention.

The Government Decision on Approval of the Regulation for Combating and Preventing the Spread of Ambrose Weeds and the Action Plan on the Implementation of the Regulation for the years 2019–2024 has been approved.

http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=377540

- Elaboration of the program of measures to combat the American maple (Acer negundo).

Ambrosia artemisiifolia L. – an invasive species, dangerous for human health

The Institute of Forestry and Management (ICAS) carried out the analysis of the American maple tree stands in the Padurea Domneasca scientific reserve. About 15% of the territory (800ha) is affected to a different extent by the American maple, which is present in natural and artificial arbors from 1–2 to 9–10 units.

- In 2011–2014, the Institute of Zoology of the ASM carried out and inventory of invasive and alien species of mammals, birds, reptiles, amphibians, insects, nematodes, fish, mollusks, crustaceans, algae with the support of the National Ecological Fund project "Biological invasions and their impact on the diversity, structure and functioning of natural and anthropogenic ecosystems in the Republic of Moldova".

https://asm.md/ru/view_project?proj_id=14565.

The specific composition of the animal invasive species was identified as well as their ecological, economic and social impact described. The Registry and a list of alien species developed and include total number – 149 species (mammals –12, birds-2, reptiles –3, fish-4, molluscs-6, crustaceans –1, hematophage arthropods 11, insects – 67, trematode –1, cestode – 6, nematodes – 36).

Invasive species of fish that are incoming accidentally or by self-expansion to the territory of Moldova – Pseudorasbora parva, Lepomis gibbosus, Perccotus glenii, Carassius auratus. At present it is expected that Ictalurus nebulosus, is coming from the Danube river in the Prut river.

The list of the most dangerous invasive species of animals for the Republic of Moldova (107 species) was revised. From the number of 55 most dangerous invasive species of animals in the world, 14 species of animals (25%) were identified in the territory of the Republic of Moldova.

National Program for Integrated Plant Protection for 2018–2027, Government Decision no. 123 of 02.02.2018.

http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=374176.

Food Safety Strategy of the Republic of Moldova for 2011–2015 (section 2.5 Public Health and the Environment), approved by the Government Decision no. 747 of 03.10. 2011.

Legal framework

Law no. 228 of 23.09.2010 on Plant Protection and Phytosanitary Quarantine.

http://lex.justice.md/md/336925/

Law on Plant Protection no 612 of 01.10.1999.

http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=311699

Law no. 221-XVI of 19 October 2007 on the sanitary-veterinary activity.

http://lex.justice.md/md/327196/

Veterinary and Phyto-Sanitary Services have been established at the 8 customs border control by the Government Decision no. 787 of 25.10.2011 on the approval of the amendments and additions to the Government Decision no. 1073 of 19.09.2008 on the optimization of the state border crossing by the means of transport with goods and passengers, the modification and abrogation of some normative acts.

Government Decision no. 356 of 31.05.2012 on approval of some normative acts for the implementation of the Law no. 228 of 23.09. 2010 on Plant Protection and Phytosanitary Quarantine.

Governmental Decision No. 145 of 13.02.2018 on approval of the amendments and additions to the Government Decision no. 356 of 31 May 2012

http://lex.justice.md/md/374302/:

- List of the Harmful organisms are relevant for the Republic of Moldova:

Insects, mites and nematodes at all stages of development – 40 s., Bacteria 0 2 sp., Mushrooms – 16 sp., Viruses and analogous organisms – 6 with varieties, Parasitic Plants – 1sp.

- List of Harmful organisms for plants and plant products relevant for the Republic of Moldova

Insects, mites and nematodes at all stages of development -28sp., Bacteria – 4sp., Mushrooms – 16sp., Virus – 16sp.

- Plants and plant products whose introduction and spread in the Republic of Moldova are forbidden – 19 sp.

Institutional framework

National Agency for Food Security (ANSA) was created in 2013 as the national authority for control of food safety, sanitary-veterinary control, plant protection and phytosanitary quarantine, seed control, quality of food and feed.

http://www.ansa.gov.md/ro/content/prezentare-generala

Monitoring system on invasive alien species (not reglemented):

- Ministry Agriculture, Regional development and Environment – *http://www.anranr.gov.md/en*

- Moldsilva Agency – *http://www.moldsilva.gov.md/*

Center for Monitoring and Forest Protection of the Moldsilva Agency ensure monitoring and plant protection measures for forest ecosystems.

- National Agency for Food Security -*http://www.ansa.gov.md/*
- Veterinary and phyto-sanitary Services at the Custom Control borders –

http://www.customs.gov.md/ro/content/proceduri-fitosanitare-si-sanitar-veterinare-la-frontiera

- Botanical Garden (Institute) Alexandru Ciubotaru – *http://www.gradinabotanica.asm.md/*
- Institute of Zoology – *http://www.zoology.asm.md/*

Republic of Moldova: Thematic Report on Alien Species, 2002 *https://www.cbd.int/doc/world/md/md-nr-ais-en.pdf*

Sustainable Development Goals

The activities under the ABT 9 have an important role to achievement of the global SDG 15 goal by 2020 to introduce measure to prevent and significantly reduce the impact of invasive alien species on land and water ecosystems.

Acer negundo. Invasive Alien Specie.

Target 10. Vulnerable ecosystems

The National Strategy for Adaptation to Climate Change (2014) identifies 6 high-risk sectors: agriculture; water resources; forestry; human health; energy; transport. According to the Notre Dame Global Adaptation Initiative (ND-GAIN), Index methodology, out of 181 countries, Moldova ranks 83th in the ranking of the most vulnerable countries.

https://gain.nd.edu/our-work/country-index/

Moldova is susceptible to three types of climate impacts: temperature increases; changes in rainfall regimes and increased aridity of climate, which are associated with the increase in the frequency and intensity of extreme weather events such as heat and frost, floods, storms with harsh rains, hail and severe droughts.

Drought is the extreme climatic phenomenon that leaves the deepest economic and social impact. The most severe and disastrous droughts throughout the instrumental record period were in 2007 and 2012, affecting more than 70 percent of the country's territory. The 2012 drought caused economic losses estimated at about US $0.4 billion.

Moldovan water basins are sensitive to climate change. Frequently, Moldova has floods on extended areas. The total damages and losses due to floods in 2010 are estimated at about 42 million US dollars. Increasing demand for water for irrigation purposes could increase competition for water resources.

In the last decade, the effect of climate change on the development of the Moldovan forests has become evident. In 2010, according to aerospace silo-pathological research data, the total area of degraded and dry forest was 13.1 thousand ha. The most important risks posed by climate change are changes of the composition of trees species, forest restoration rate, increasing pest attacks, and phytosanitary risks. The Moldova 2030 Strategy provides with a national target to increasing forest cover to 16% by 2030.

GHG emissions.

In 2015, the Republic of Moldova issued about 13.95 Mt of CO2, which is below 0.04% of total global emissions. CO2 sequestration by the forest vegetation in Moldova Fig. 20

Types of forestry associations that contribute to the CO2 sechestration. Fig. 21

Measures to mitigate climate change effects to vulnerable ecosystems

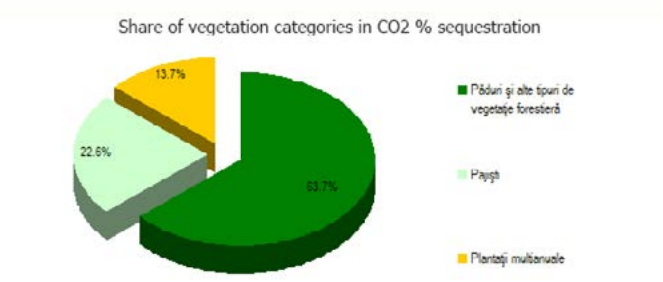


Figure 20. CO2 sequestration by forest vegetation in the Republic of Moldova

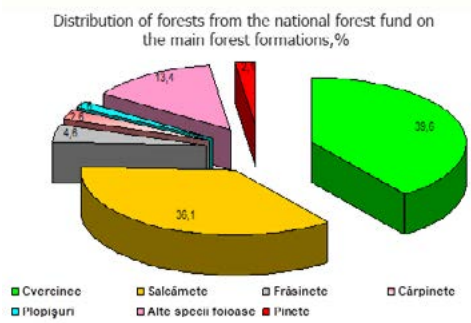


Figure 21. Forest associations that contribute to CO2 sequestration

Legal initiatives

- The Law of Animal Kingdom 439/1995 was partially harmonized with the provisions of Directive 2009/147 / EC of the European Parliament and of the Council of 30 November 2009 on the conservation of wild birds.

http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=374272

- The provisions of Council Directive 92/43 / EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora have been partially transposed into national law by the completion of the Law of Vegetable Kingdom No 239/2007 and Law no. 94 / 2007 with on the ecological network)
- Amendments to the Law on the Ecological Network were approved to introduced Emerald Network areas of special interest for preservation and legal base on the creation of the Emerald Network on the territory of the Republic of Moldova.

http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=334071

- The draft Strategy for the Adaptation of the Forestry Fund to Climate Change was elaborated in the context of the implementation of the provisions of the United Nations Framework Convention on Climate Change.
- The National Plan for the extension of the forest vegetation areas for the years 2014–2018 approved by the Government Decision no. 101 of 10.02.2014.

Afforestation of degraded land

Total = 29.59 *th.ha* of planted forest.

790 ha of degraded land were afforested, according to the provisions the National Plan for the extension of the forest vegetation areas for the years 2014–2018 approved by the Government Decision no. 101 of 10.02.2014.

Forest planted on the territory of 8.5 *th.ha*. Project "Soil Conservation in Moldova" (PCSM, 2002-20022) implemented by the Institute for Forestry Management

http://icas.com.md/activitati-2/proiecte-internationale-in-derulare/

The Development of the Municipal Forestry Sector in Moldova ".

http://icas.com.md/activitati-2/projects-international-in-derulare/
https://cdm. unfccc.int/filestorage/j/k/ARZXTB4JLQU36S0NHWVGKIFOY7981D.pdf/PDD.pdf?t=b3p8cGNzNGN4fDC4iivY3fVfkOw7ZSPbGHQy

Plantation of 20.3 th. ha of land (mostly degraded or with erosion phenomena) and 8,468 ha of degraded land.

Orhei National Park

Parliamentary Decision no. 201 of July 12, 2013 "On the foundation of Orhei National Park.

http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=3492

The Orhei National Park was created on an area of 33,792.09 ha.

The Rules of Operation of Orhei National Park was approved by Government Decision no. 923 of 12.11.2014

http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=355414.

Community pasture and forest management plans was developed for 18 communities part of the Orhei National Park. EU/UNDP project "Clima-East Moldova: Climate change mitigation and ecosystem-based adaptation in Orhei National Park", 2013–2016.

http://www.md.undp.org/content/moldova/ro/home/operations/projects/climate_environment_energy/proiecte-finalizate/clima-east--ecosystem-based-adaptation-and-mitigation-of-climate.html

Wetlands

The Lower Prut Scientific Reserve

Three International Ramsar wetland areas: Ungur-Holosnita, Nistru de Jos and Prutul de Jos has been established by the Law no. 1538/1998 on the Nature Protected Areas Fund. Total area of protected wetlands – 113858,5 ha.

Biosphere Reserve "Danube Delta – Prutul de Jos"

Biosphere Reserve "Prutul de Jos " was established by Law no. 132 of 07.13.2018 for the preservation of terrestrial geographic areas and /or elements and formations aquatic physical and geographical national and international importance, comprising indigenous species of plants and animals, this specific area. Biosphere reserve " Prutul de Jos" occupies an area of 14,771.04 ha.

http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=376873

MIS ETC 1716 (CBC) project "Strengthening the protected natural areas protecting biodiversity and sustainable development in the Danube Delta and the Prutul de Jos – PAN Nature" funded by the European Union.

Nistru de Jos National Park

The process of setting up Nistru de Jos National Park started in 2018 as a result of the implementation of the project "Adaptation based on ecosystem, measures of climate resistance and institutional development in Nistru de Jos". The project is supported by the Austrian Government. At present, the Council Regulation of the Nistru de Jos International Ramsar Management Board was approved.

Ecological Network

The National Ecological Network of Moldova as part of the Pan-European Ecological Network, has been established in 2007 by the Law on Ecological Network.

http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=334071

Emerald Network

In the period 2009–2017 Republic of Moldova with the support of the Council of Europe and the European Union project on Creation of the Emerald Network of natural areas of special protection, has developed the national database for the Emerald Network sites, species and habitats, protected under the Europe's Convention on the Conservation of European Wildlife and Natural Habitats (1979), Bern Convention. The total number of the Emerald Network sites – 52, habitats – 34 Species -165sp. The total area of the Emerald sites cover – 8% of the territory of the country. In 2018 – the list of Moldovan Emerald sites have been approved as the Adopted Emerald Network Sites. Amendments to the Law on the Ecological Network were approved to introduced Emerald Network of areas of special interest for preservation and the legal provisions for the creation of the Emerald Network on the territory of the Republic of Moldova

http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=334071

Improvement Management of Protected Areas

The Cadaster on Protected Areas, elaborated according to the provisions of the Government Decision no. 414 of 02.05.2000 was developed by the Institute of Ecology and Geography.

http://www.ieg.asm.md/en/node/133

Pasture and Forest management plans accommodating conservation of rare and endangered species was developed for 4 communities from Soroca and Stefan-Voda districts. The UNDP/GEF project "Mainstreaming biodiversity conservation into Moldova's territorial planning policies and land use practices", 2015–2018.

http://www.md.undp.org/content/moldova/ro/home/projects/biodiversity-mainstreaming-project.html

The Guide for the Management of Protected Areas Management Plans under GEF project "Strengthening Institutional Capacities and Representativeness of Protected Areas in the Republic of Moldova", with the aim of contributing to the improvement of the protected area management system.

Http://old. *mediu.gov.md/images/Ghid%20pentru%20elaborarea%20Planurilor%20de%20Managementape%20AP%20in%20RM_pdf%20mic.pdf*

A study on the relationship between ecosystems, biodiversity and the aspect of climate change has been provided under the Technical Rules developed with the support of the ENPI-FLEG Program "Improving the Implementation of Forest Law and Governance (FLEG) in the Neighborhood Policy with Eastern Europe and Russia", funded by the EU and implemented by WB, IUCN and WWF.

Good agricultural practices

Rehabilitation of protection forestry strips in agricultural fields. In the period 2014–2017, following the implementation of Sub-component 3.3: "Support for rehabilitation of protection strips" of the project "Competitive Agriculture in Moldova (MAC-P)", the total volume of rehabilitation of protection forest strips about 2,241.8 ha, protected agricultural area of about 60,000 hectares.

http://www.capmu.md/wp-content/uploads/2018/02/Raport_2017MACP_-final.pdf

No-Till and Mini-Till: total areas of 16,181 ha. Intelligent solutions for performance – from conventional agriculture to conservative agriculture.

http://www.capmu.md/2018/01/solutii-inteligente-pentru-performanta-de-la-agricultura-conventiona-la-la-agricultura-conservativa/

The Practical Guide to Organic Farming (Field Cultures) was developed.

https://eco-tiras.org/books/Ro-2.pdf.

Sustainable Development Goals

The activities under the ABT 10 have an important role to achievement of the global SDG goals, in particular to the SDG 13, to strengthen resilience and adaptive capacity to climate change and natural disasters.

Target 11. Protected areas

The national target to extend protected areas in the Republic of Moldova at 8% of the country's territory by 2023 was stipulated in the National Strategy on Environmental Protection, 2014

http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=352740.

In general, the Protected Areas System in the Republic of Moldova covering practically all natural ecosystems, such as forest, steppe, meadow and petrophyte.

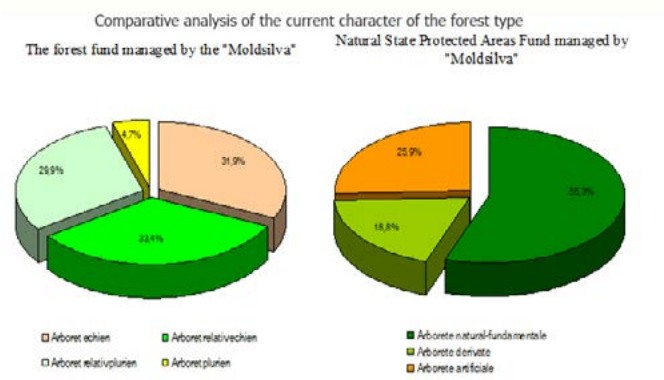


Figure 22. Current character of forest types

According to the Law on the State Natural Protected Areas Fund, the total area of the State Natural Protected Areas Fund constitute 210,695.87 ha (2,106.96 km2), or 5,8% of the total territory of the country. The State Natural Protected Area Fund involve a total number of 307 protected areas, including: National park, Biosphere reserve, 5 Scientific reserves, Nature monuments, Nature reserves, Landscape reserves, Natural Recourse reserve, Wetlands of international importance (Ramsar), Multifunctional management areas, Landscape architecture monuments, Dendrological and zoological gardens. Fig. 22. The map of Natural Protected areas is presented in the Fig 23.

http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=311614

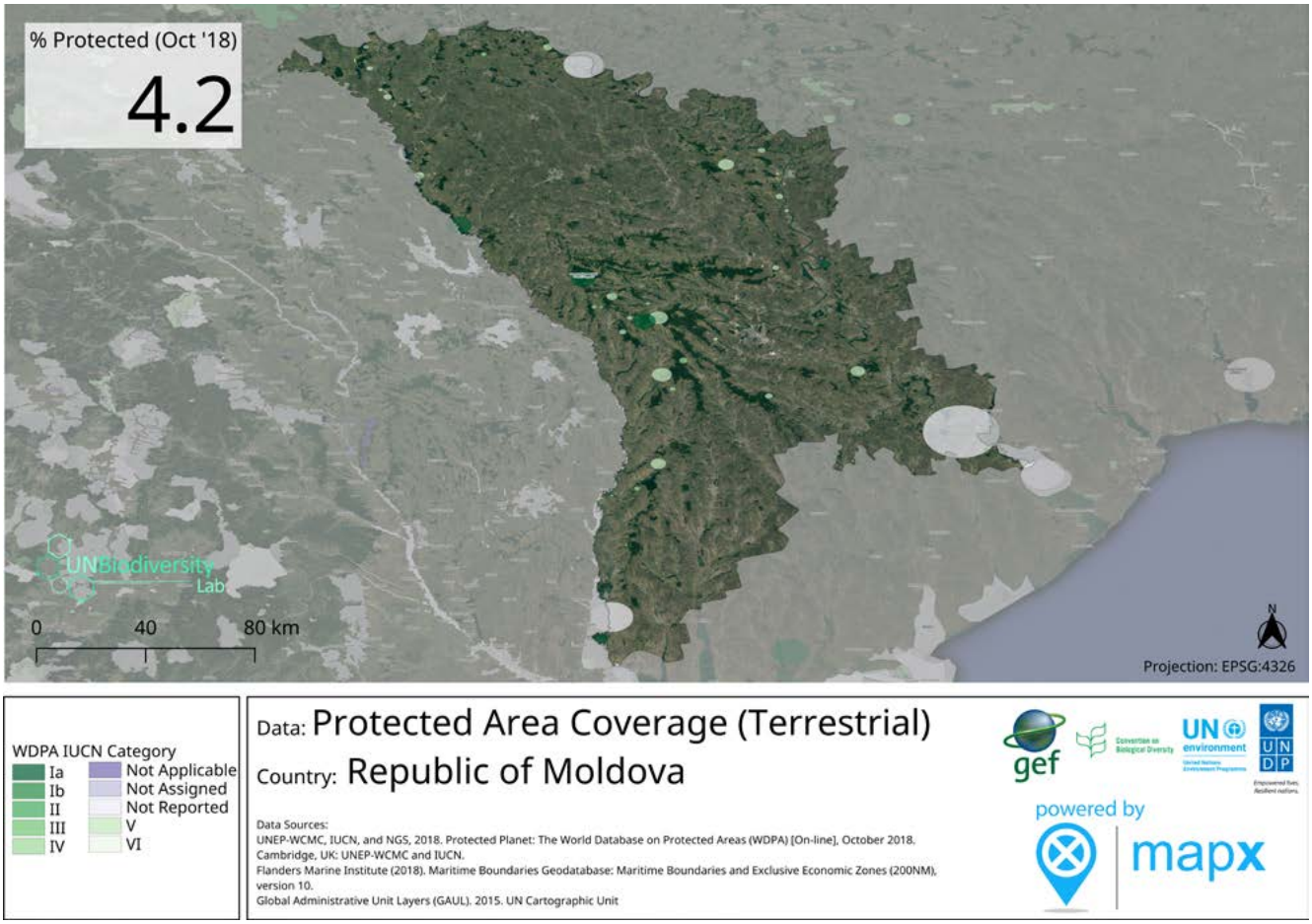


Figure 23. Natural protected areas of the Republic of Moldova

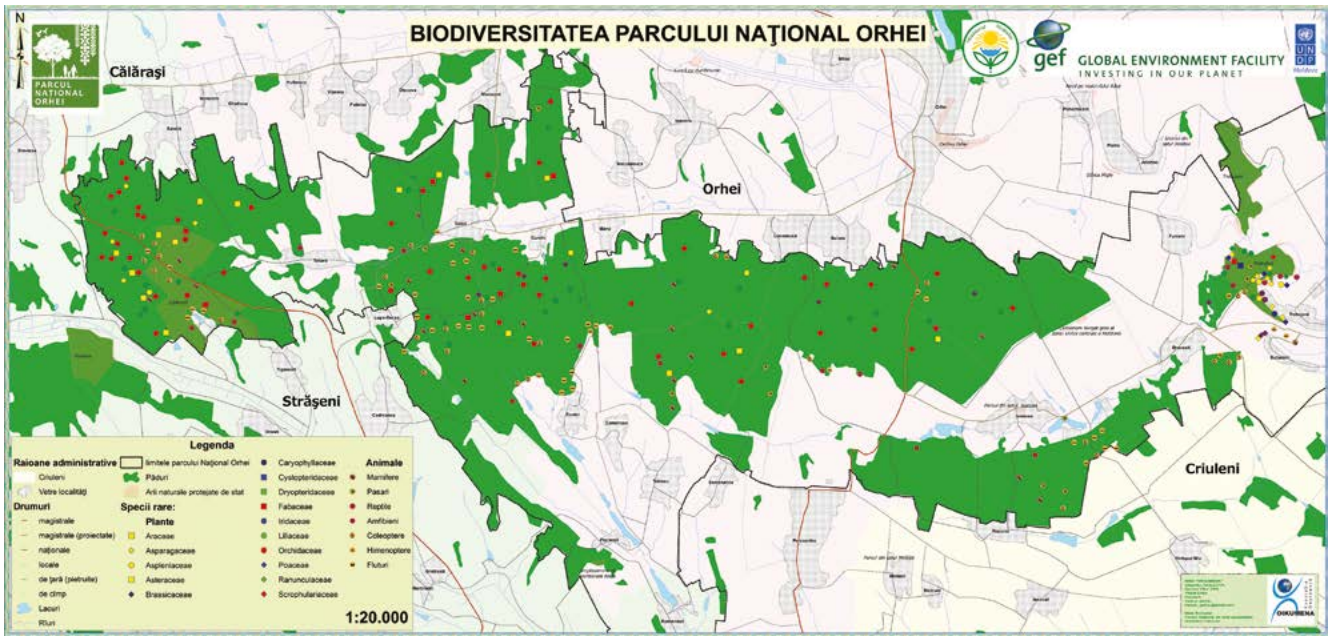


Figure 24. Orhei National Park

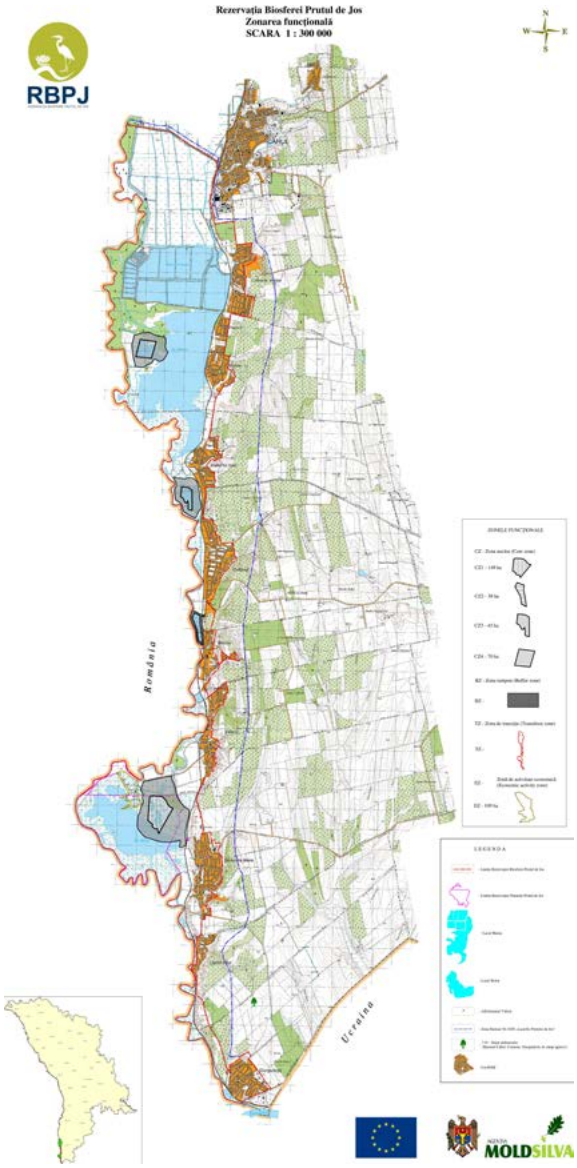


Figure 25: "Prutul de Jos" Biosphere Reserve

Extension of protected areas

In 2006, three Ramsar wetland areas of international importance have been included in the Law on the State Natural Protected Areas Fund, including Prutul de Jos lakes, Nistru de Jos and Unguri-Holoșnița, and constitute area of 94,705.5 ha (947,06 km2). The total are of the protected natural areas in the country increased to 4.65%.

In 2013 the Orhei National Park has been established with the area of 33,792.09 ha (337,92 km2), that lead to the extension of the total surface of protected natural areas, up to189385.9 ha, which constituted 5.61% of the territory of the country. *http://lex.justice.md/md/349420/*. Map of Orhei National Park – Fig. 24.

In 2018, the Biosphere Reserve "Prutul de Jos" was founded by Law no. 132 of 13.07.2018 for the purpose of preservation of terrestrial and / or aquatic geographic areas with elements and physical-geographic formations of national and international importance, including indigenous plant and animal species specific to this territory. Map of the Biosphere Reserve Prutul de Jos – Fig. 25. *http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=376873*

The total area of the Biosphere Reserve "Prutul de Jos" is of 14,771.04 ha, or 147.71 km2, including 824 ha, or 8.24 km2 of forestry land. The

management of the Biosphere Reserve "Prutul de Jos" is established in the Framework Regulation of Biosphere Reserves approved by the Government Decision no. 782 of 3 August 2000. *http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=304680*.

The total area of the natural areas protected by the State in 2018 achieved 210,695.87 ha (2,106.96 km2), or 5,8% of total territory of the country. Grow of the National designation protected areas and site number for Moldova is represented in the Fig. 26.

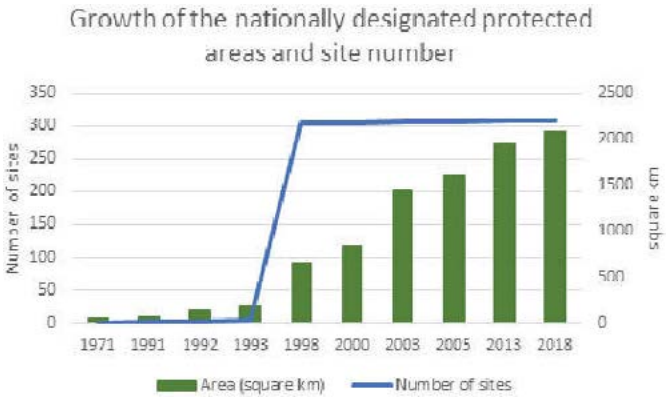


Figure 26. Growth of the nationally designated protected areas and site number

Nistru de Jos National Park (future)

The process of setting up Nistru de Jos National Park started in 2018 as a result of the implementation of the project "Adaptation based on ecosystem, measures of climate resistance and institutional development in Nistru de Jos". The project is supported by the Austrian Government. At present, the Council Regulation of the Nistru de Jos International Ramsar Management Board (in the limits of the future Nistru de Jos National Park) was approved.

Ecological Network

The National Ecological Network of Moldova as part of the Pan-European Ecological Network, has been established by the Law on Ecological Network.

http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=334071.

The National Ecological Network consists of the following functional elements: a) core zone; b) buffer zone; c) ecological corridors; d) ecological reconstruction areas.

https://www.iucn.org/regions/eastern-europe-and-central-asia/projects/completed-projects/ecological-network-moldova

This constitute total area of 127,871ha, or 7,5% of the territory of the country. The National Program on the Establishment of the National Ecological Network for 2011–2018, approved by the Government Decision no. 593 of 1 August 2011.

http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=339794

Emerald Network as part of the Pan-European Ecological Network

In the period 2009–2017 Republic of Moldova with the support of the Council of Europe and the European Union project on Creation of the Emerald Network of natural areas of special protection, has developed the national database for the Emerald Network sites, species and habitats, protected under the Europe's Convention on the Conservation of European Wildlife and Natural Habitats (1979), Bern Convention. The total number of the Emerald Network sites – 52, habitats – 34 Species –165 sp. The total area of the Emerald sites cover – 8% of the territory of the country. In 2018 – the list of Moldovan Emerald sites have been approved as the Adopted Emerald Network Sites. Amendments to the Law on the Ecological Network were approved to introduced Emerald Network of areas of special interest for preservation and the legal provisions for the creation of the Emerald Network on the territory of the Republic of Moldova.

Figure 27. National Ecological Network of the Republic of Moldova

http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=334071

Red Book

The 3rd edition of the Red Book of the Republic of Moldova published in 2015 and approved by the Law on Red Book. It includes 208 species of plants and 219 species of animals.

http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=315224

Development of management plans and guides for protected areas

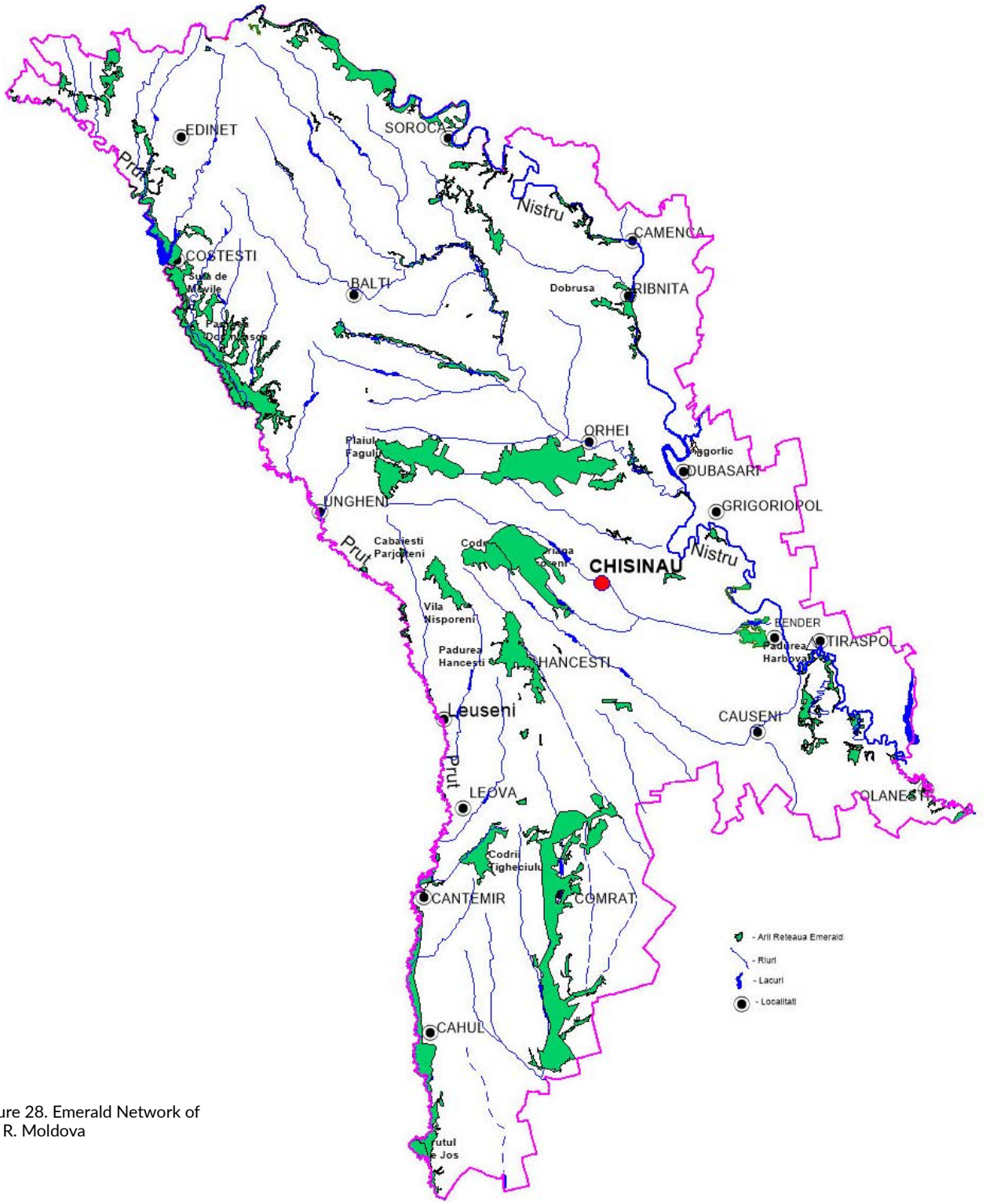


Figure 28. Emerald Network of the R. Moldova

Following the provisions of the international treaties on biological diversity, a series of guides and publications have been developed which directly or tangentially contribute to the conservation of biological diversity, including:

1. The Guide for the Protected Areas Management Plans under GEF project "Strengthening Institutional Capacities and Representativeness of Protected Areas in the Republic of Moldova", with the aim of contributing to the improvement of the protected area management system.

http://old.mediu.gov.md/images/Ghid%20pentru%20elaborarea%20Planurilor%20de%20Managementape%20AP%20in%20RM_pdf%20mic.pdf

2. "Guidelines for Operational Management of Protected Areas". The guide presents basic elements on processes related to management, human resource management, information management, economic planning and financial management, and related to the main management activities.

http://old.mediu.gov.md/images/Ghid%20Management%20operational_4%20iulie%202013_pdf%20mic.pdf

3. Guide for Management of Conservation in Protected Areas of the Republic of Moldova ". The guide describes step by step how to set up a comprehensive program for effective biodiversity conservation activities and provides some practical recommendations and examples for the conservation of species and habitats.

http://old.mediu.gov.md/images/Ghid%20pentru%20Managementul%20coservarii%20in%20AP%20din%20RM_pdf%20mic.pdf

4. Guide to Visitor's Management and Tourism Development within and around Protected Areas of the Republic of Moldova ". This guide is intended to support protected area staff to plan and implement visitor management, especially in the protected area, and to support the sustainable development of tourism in the wider region around the area.

http://old.mediu.gov.md/images/Ghid%20pentru%20managementul%20vizitatorilor%20si%20dezvoltarea%20turismului%20in%20interiorul%20si%20in%20jurul%20AP%20din%20RM_pdf%20mic.pdf

5. "Recommendations for a national system of management categories for protected areas in the Republic of Moldova and on general rules for each category of protected areas". The recommendations are a tool for national, regional and local authorities, administrators of protected areas as well as other organizations / institutions involved in protected areas management to improve their contribution to effective management implementation.

http://old.mediu.gov.md/images/Recomandari%20pentru%20sistemul%20national%20de%20categorii%20de%20management%20pentru%20AP_pdf%20mic.pdf

6. "Guidelines for Monitoring of Management Efficiency and Reporting System for Protected Areas in the Republic of Moldova". The Guide supports the managers of protected areas and coordinating institutions to improve management efficiency.

http://old.mediu.gov.md/images/Ghid%20pentru%20elaborarea%20Planurilor%20de%20Managementape%20AP%20in%20RM_pdf%20mic.pdf

7. Botanical Atlas by E. Alexandrov, 2014, 317 p. The paper presents the system of classification of the diversity of the vegetal kingdom, both the popular names of the species and the scientific ones, which are established according to the International Code of Botanical Nomenclature.
8. The Guide for the elaboration of the management plans of the protected areas in the Republic of Moldova developed within the framework of the UNDP/GEF project "Improving Coverage and Management Effectiveness of the Protected Area System"

http://www.moldsilva.gov.md/public/files/publicatii/Ghid_Planul_de_Management_al_Ariilor_Protejate_2013.pdf

9. The Community pasture and forest management plans was developed for 18 communities part of the Orhei National Park. EU/UNDP project "Clima-East Moldova: Climate change mitigation and ecosystem-based adaptation in Orhei National Park", 2013–2016

http://www.md.undp.org/content/moldova/ro/home/operations/projects/climate_environment_energy/proiecte-finalizate/clima-east--ecosystem-based-adaptation-and-mitigation-of-climate.html

10. Pasture and Forest management plans accommodating conservation of rare and endangered species was developed for 4 communities from Soroca and Stefan-Voda districts. UNDP/GEF project

"Mainstreaming biodiversity conservation into Moldova's territorial planning policies and land use practices", 2015–2018

http://www.md.undp.org/content/moldova/ro/home/projects/biodiversity-mainstreaming-project.html

GIS Maps on protected areas Geoportal:

https://geoportal.md/en/default/map#lat=119512.147026&lon=179066.076851&zoom=6&layers=258,_base6,_base1

Cadaster of Protected Areas: *http://www.ieg.asm.md/en/node/133*

Map of Forests of the Republic of Moldova: *www.icas.com.md/map*

Un Biodiversity Lab *https://unbiodiversitylab.org/*:

- Map on Natural Terrestrial Protected Areas for Moldova – TerrestrialProtectedAreas_MDA.png
- Map of Species Richness within the National Protected Areas for Moldova – SpeciesRichness_MDA.png
- MapofProtectedAreasCoverageofKeyBiodiversityAreasinMoldova–KeyBiodiversityAreaProtection_MDA.png
- Map of Protected Area Each Terrestrial Ecoregion – EcoregionProtection_MDA.png
- Map of Protected Area management Effectiveness – ProtectedAreaManagementEffectiveness_MDA.png
- Map of Protected Area Connectivity with Given Ecoregion – ProtectedConnectedIndex_MDA.png

Sustainable Development Goals

The activities under the ABT 11 have an important role to achievement of the global SDG 15 goal, by 2020 to ensure conservation of terrestrial and inland freshwater ecosystems.

Please describe other activities contributing to the achievement of the Aichi Biodiversity Target at the global level (optional):

Target 12. Preventing extinctions

Moldova has a wide variety of species, with agri-forest biodiversity being dominant. Thus there are 1,842 species of vascular plants, about 4,600 species of inferior plants and mushrooms, 13 relict species, rare species are 208 plant and fungal species (3% of the total number of species), 4 species are at the limit of natural spread.

There are about 16,540 species of animals (461 vertebrates and over 16,000 invertebrates), including 55 Ponto-Caspian relic species (of which 10% are endemic to the Black Sea basin) and 219 rare species (1.32% of the total number of animal species).

Ciconia ciconia (Linnaeus, 1758)

There is no recorded extinction species in Moldova since the Strategic Plan for Biodiversity 2011–2020.

Among the threats that contributed to the decline of biodiversity there are anthropogenic factors, such as, pollution, fragmentation of habitats, poaching, forest deforestation, over-exploitation, population growth, and invasive alien species.

Drought is the extreme climatic phenomenon that leaves the strong impact to biodiversity. The most severe and disastrous droughts throughout the instrumental record period were in 2007 and 2012, affecting more than 70 percent of the country's territory.

Frequently, Moldova has floods on extended areas. The total damages and losses due to floods in 2010 are estimated at about 42 million US dollars.

The abundant snow of April 20–21, 2017 leads to destroying of important areas of forest in the center and southern part of Moldova and causing decrease of population of many species of plants and animals, including endangers species.

Red Book

The 3rd edition of the Red Book of the Republic of Moldova, published in 2015 and approved by the Law on Red Book. It includes 208 species of plants and 219 species of animals.

http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=315224.

The 3rd edition of the Red Book of the Republic of Moldova was published in 2015.

http://gradinabotanica.asm.md/sites/default/files/Cartea%20Rosie-ilovepdf-compressed.pdf

The total 208 species of plants and fungi species have been included, from them: 150 species – angiosperms, 1 – gimnosperme species, 14 – pteridophytes species, 7 – bryophytes species, 8 – algae species, 14 – basidiomycetes species, 14 – ascomycetes species, that is with 82 species more than in the 2nd edition of the Red Book.

A total number of 219 species of animal species have been included, from them – 30 – mammals species, 62 – birds species, 9 – reptiles species, 9 – amphibians species, 23 – fish species, 1 – cyclostomes species, 79 – insects species, 1 – colemboles species, 1 – crustaceans species, 3 – bivalve species, that is with 103 species more than in the 2nd edition of the Red Book.

It is attested a negative trend of the state of endangered species of flora and fauna in Moldova. Thus, the 1st edition of the Red Book (1978) included 26 species of vascular plants and 29 species of vertebrate animals.

The 2nd edition of the Red Book (2001) include 126 plant species and 116 animal species, and the 3rd edition of the Red Book – 208 species of plants and fungi and 219 species of animals are included.

The list includes the species of plants, fungi and animals in the following categories of vulnerability according IUCN: Vulnerable (VU), Endangered (EN), and Critically Endangered (CR).

A number of rare species on the territory of the Republic of Moldova Cypripedium calceolus, Trapa natans, Carlina acaulis, Vipera ursini, Aythya nyroca are included in the "Red Book of Europe". The Red List Index of species survival for Moldova, weighted by the fraction of each species' distribution occurring within the country. The index varies from 1 if the country has contributed the minimum it can to the global Red List Index (i.e. if all species in the country are classified as Least Concern) to 0 if the country has contributed the maximum it can to the global Red List Index (i.e., if all species in the country are classified as Extinct or Possibly Extinct). A downwards trend indicates declining aggregate survival probability of the country's species. The index is based on all mammals, birds, amphibians, reef-building corals and cycads native to the country (noting that not all countries support species in all these groups). During 1993–2018, the Red List Index changed at an annual rate equating to 0.02%. Fig. 29.

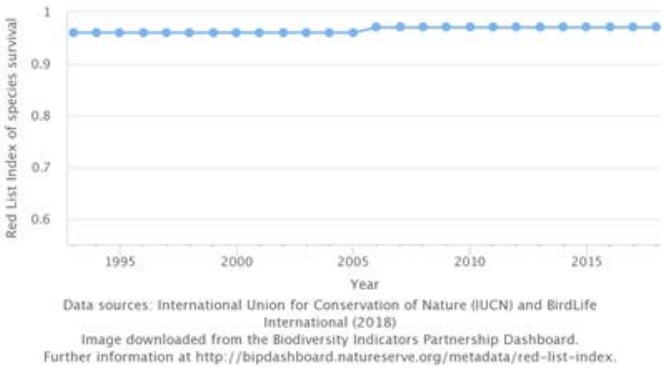


Figure 29. Red List Index of species survival

http://bipdashboard.natureserve.org/bip/SelectIndicator.html?iso=MDA&reg=Europe

In-situ conservation

The in-situ conservation of endangered species is ensuring by the System of Protected Areas in Moldova. In the period of 2006–2018 the total area of protected areas of all categories has increased from 4,65% to 5,8%. The new protected areas have been established, among them: Orhei National Park, Biosphere Reserve Prutul de Jos, wetlands of the international importance. A project of a new National Park – Nistru de Jos is under development.

The National Ecological Network and the Emerald Network support activities to ensure survival of engineered species protected in the European context as part of Pan-European Ecological Network and Natura 2000.

GIS boundaries maps and ecological database for 165 species of endangered species of plants and animals protected by the Bern Convention have been developed within the Emerald Network project. See details in the Target 11 – Protected areas.

Biogeographic Emerald Network process.

Moldova has participated in the European Biogeographical seminars initiated by the Council of Europe to ensure the self-assessment of sufficiency of the identified Emerald sites for the endangered species and habitats under the protection of Bent Convention.

https://www.coe.int/en/web/bern-convention/conclusions-of-the-biogeographical-seminars.

The Regional Biogeographical Seminar for Moldova, Ukraine, Belarus, and Russia on the creation of the Emerald Network was held in Chisinau,11–13 May 2016.

http://old.mediu.gov.md/index.php/serviciul-de-presa/noutati/2454-reteaua-emerald-din-republica-moldova-este-conceputa-ca-parte-componenta-a-retelei-%20eco-national-and-is-a-part-full-of-network-environment-pan-European

Monitoring of biodiversity

The monitoring of the diversity of plant and animal species is currently carried out by relevant institutions: the Institute of Zoology, Botanical Garden (Institute) Alexandru Ciubotaru, Institute of Geography and Ecology, State Ecological Inspectorate, Moldsilva Agency, Institute for Forest Management, scientific reserves Plaiul Fagului, Codrii, Iagorlic, Prutul de Jos.

Management of endangered species

The Institute of Zoology has developed three Management Programs for Conservation of Species (Acipenser ruthenus, Mustela Lutreola and Boombus Fragrans. The mentioned programs include the biologic characteristic, rarity status, spreading and boundary in the Republic of Moldova, habitat and ecological information, limiting factors, climatic changes etc.

The study "Habitat of Rare Species of Plants and Animals from Soroca and Ştefan Vodă distrcts of the Republic of Moldova" was carried out within the project UNDP/GEF project "Mainstreaming biodiversity conservation into Moldova's territorial planning policies and land use practices", 2015–2018. The study presents information on the habitats of rare species of plants and animals in the districts of Soroca and Stefan Voda. The general characterization of habitats, plant and animal species is presented.

http://www.md.undp.org/content/dam/moldova/docs/Publications/book%20v13%20RO.pdf
http://www.md.undp.org/content/moldova/en/home/projects/biodiversity-mainstreaming-project.html

Legal framework

The provisions of Council Directive 92/43 / EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora have been transposed into national law by amending Law no. No 439/1995 on Animal Kingdom (No 237 of 17.11.2017).

http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=374272

Law on Vegetal Kingdom No 239/2007 and Law 94/2007 on Ecological Network (No 162 of 20.07. 2017)

Http://lex. *justice.md/index.php?action=view&view=doc&lang=1&id=371744*

The Law of Animal Kingdom 439/1995 was partially harmonized with the provisions of Directive 2009/147 / EC of the European Parliament and of the Council of 30 November 2009 on the Conservation of Wild Birds (OJ L 20, 26.1.2010, p. 237 of 17.11.2017).

http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=374272

New provisions of the Articles 1 to 8 of the EC Birds Directive have been included the law, regarding the measures for protection and preservation of migratory birds, breeding areas, and passage areas on their migration routes.

By Law no. 208 of 17.11.2016 art. 140 of the Code of Contravention no. 218-XVI of 24.10.2008 was supplemented with provisions for sanctioning, in addition to the collection or destruction of plants, the capture or destruction of the animals included in the Red Book of the Republic of Moldova and in the

Appendices to the Convention on International Trade in Wild Fauna and Flora Endangered Species (CITES) and with provisions on sanctioning the illegal commercialization of the specified plant and animal species.

http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=367933).

The Protected Area Representativeness Index for Moldova was 0.062 in 2016. During 2000–2016, the index changed at an annual rate of 2.74%. Fig 30.

http://bipdashboard.natureserve.org/bip/SelectIndicator.html?iso=MDA&reg=Europe.

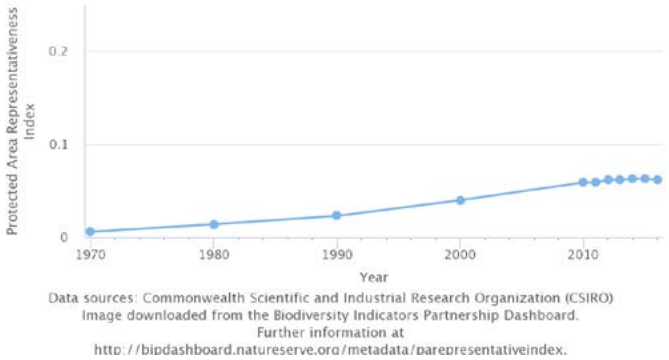


Figure 30. Protected Area Representativeness

The provisions on the establishment and approval of special areas of avifauna protection and their special protection areas, measures to prevent pollution and deterioration of habitats of wild birds, including migratory birds were also included (according to Article 5 of the Directive).

- Forest Code no. 887-XIII of 21 June 1996 (update);
- Law no. 1515-XII of 16 June 1993 on Protection of the environment;
- Law on Animal Kingdom no. 439-XIII of 27 April 1995;
- Law Vegetable Kingdom no. 239-XVI of November 8, 2007;
- Law no. 1102-XIII of 6 February 1997 on Natural Resources;
- Law no. 1538-XIII of 25 February 1998 on Natural Protected Areas Fund;
- Law no. 591-XIII of 23 September 1999 on the Green Areas of Urban and Rural Localities;
- Law no. 1041-XIV of June 15, 2000 on Afforestation of Degraded Land;
- Law no. 755-XIV of 21 December 2001 on Biosafety;
- Law no. 325-XVI of 15 December 2005 on the Red Book of the Republic of Moldova;
- Law no. 149-XVI of 8 June 2006 on the Fish Fund, Fishing and Fish Farming;
- Law no. 94-XVI of 5 April 2007 on the Ecological Network.

UN Biodiversity Lab – *https://unbiodiversitylab.org/*:

- Map of Species Richeness/Threatened Species Richness/Critically Threatened Species Richeness for Moldova – ThreatenedSpeciesRichnessWithinEffectivelyManagedProtectedArea_MDA.png
- Map of Threatened Species Richness within Effective Protected Areas for Moldova –

ThreatenedSpeciesRichness_MDA.png

Sustainable Development Goals

The activities under the ABT 12 have an important role to achievement of the global SDG 15 goal, in particular to effective regulate harvesting and overfishing, illegal fishing and restore fish stocks, to take urgent measures to reduce the degradation of natural habitats, halt the loss of biodiversity and by 2020 protect and prevent the extinction of threatened species.

Target 13. Agricultural biodiversity

Agricultural Genetic resources

Policy framework

In 2015 the Republic of Moldova ratified the International Treaty on Plant Genetic Resources for Food and Agriculture, adopted in Rome on 3 November 2001, by the Law no. 94 of 14.05.2015.

http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=359241

The alternation of ecosystems in the Republic of Moldova

The National Program for Vegetable Genetic Resources for Agriculture and Food in Moldova has been developed under the FAO project "Support for Development National Program for Vegetable Genetic Resources for Food and Agriculture in Moldova (PGRFA)" (2015-2017). The national program will have a positive impact on food security, sustainable agriculture and agricultural biodiversity conservation through efficient use of national plant genetic resources in plant breeding and seed sector. At present, the National Program for Vegetable Genetic Resources for Agriculture and Food in Moldova is in the approval process.

http://maia.gov.md/ro/categorii/proiecte-de-asistenta-externa-sectorul-agroalimentar

Moldova has developed respective strategies and plans to maintain genetic diversity in-situ and ex-situ:

- The National Strategy for Agricultural and Rural Development for the years 2014–2020, approved by the Government Decision no. 409 of June 4, 2014;
- The Environmental Strategy for 2014–2023 and its Action Plan, 2014;
- Law on Vegetable Kingdom no. 239 of 08.11.2007;
- Law on Animal Kingdom no. 439/1995.

At present a number of strategic documents have been drafted with the support of technical assistance projects:

- Draft National Program for the Production of the Meat Sector;
- Draft National Program for the Conservation of Animal Genetic Resources;
- Draft National Program for the Development of the Aquaculture Sector;
- Draft Program for the development of conservative agriculture;
- Draft National Beekeeping Development Program for the period 2018-2025;
- Draft Horticulture Development Program in the Republic of Moldova for the years 2017-2020;
- Draft Wine Development Program.

Vegetal agrobiodiversity:

The vegetal agrobiodiversity of the Republic of Moldova, including their wild relatives is preserved ex-situ in the experimental fields and seed collections by the research institutions: the Institute of Genetics, Physiology and Plant Protection, the Scientific-Practical Institute of Horticulture and Food Technologies, Institute of Practical Science Phytotechny "Selectia", Institute of Phytotechnology "Porumbeni".

In the Catalog of Plant Varieties of the Republic of Moldova (2016), total 3,016 of plant varieties and hybrids of cultivated plants are introduced, of which 198 are new, including cereals – 396 varieties, oilseeds – 295, technical plants – 93 varieties, forage – 36 plants, aromatic and medicinal plants – 36 varieties, vegetable species – 829 varieties, ornamental plants – 64, fruit trees and shrubs – 328 varieties, 36 – vine rootstock, grape varieties – 93 varieties, vine clones – 161 varieties.

http://maia.gov.md/sites/default/files/article/galery/text_catalogul_2016_tipar.pdf

The Gene Bank's seed collection at the Institute of Genetics, Physiology and Plant Protection maintains genetic material of about 5.4 thousand samples from 34 botanical families, 145 genres and 223 species, including the most important cereal plant varieties (wheat, rye, barley, triticale etc.), corn (over 700 samples), legumes (beans, chickpeas, lentils etc.), vegetables (tomatoes – 820 varieties, peppers – 200 genotypes, eggplants – 60), and aromatic and medicinal (150 species).

http://igfpp.asm.md/en/node/302

The collection samples of traditional agricultural plants from the peasant households, includes the following varieties:

- Zea mays subsp. everta, Z. mays ssp. indurata, Z. mays ssp. indentata, Z. mays ssp. semidentata, Z. mays ssp. saccharata;
- Phaseolus vulgaris, Phaseolus coccineus;
- Vicia faba, Cicer arietinum, Pisum sativum and Lathyrus sativus;
- Solanum lycopersicum and its varieties;
- other species: – Cucurbita maxima, Allium sativum, Capsicum annuum, Allium cepa, Cucurbita pepo, Anthum graveolens, Petroselinum crispum, Cucumis sativus, Solanum melongena, Daucus carota, Solanum tuberosum, Citrullus lanatus, Levisticum officinale, Cucumis melo etc.

In the rural households, some species of aromatic and medicinal plants, such as Ocimum basilicum, Thymus vulgaris, Calendula officinalis, Tagetes officinalis, Mentha sp. were collected.

The National Center for Vegetal Genetic Resources of Moldova has been established by the G. D. nr. 12.03.of 14.12.1998

http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=298165

Institute of Practical Science Phytotechny "Selectia" – *http://agriculture.cia.md/fito/index.html*

The total 349 crops varieties and hybrids were selected at Institute of Practical Science Phytotechny "Selectia", of which 160 were approved, including 17 winter wheat varieties, 15 barley, 16 peas, 18 soybeans, 12 bean, 18 sunflower hybrids, 6 sugar beet varieties, etc. During the last 10 years, 73 varieties and hybrids have been transmitted to the State Commission for Crops Variety Testing of which 32 have been approved.

http://cstsp.md/en/organization.html

Institute of Phytotechnology "Porumbeni" – *http://porumbeni.md/*

Total over 1,100 varieties, 1,500 inbred lines and 1,400 of mutants of maize are maintained. Over 2000 hybrid combinations are tested annually.

The Scientific and Practical Institute of Horticulture and Food Technologies – *Http://Agriculture.Cia.Md/Ispha/Index*. Html

The National Collection of Microorganisms for the Oenological Industry is maintained by the Laboratory "Biotechnology and Microbiology of Wine". There are 103 strains of Saccharomyces species of different species such as: Saccharomyces vini – 58 strains; Saccharomyces cerevisiae – 24 strains; Saccharomyces bayanus – 9 strains; Saccharomyces oviformis – 5 strains; Saccharomyces uvarum – 3 strains stored in

the collection; Saccharomyces steineri – 2 strains; Saccharomyces pasterieur – 1 strains; Saccharomyces walk –1 strains.

The following performance protocols for grapes varieties were developed: Fetească regală, Fetească neagră, Black Rare, Riesling de Rhin, Cabernet fran, Cabernet Sauvignon, Malbec, Merlot, Syrah, Muscat White, Chardonnay, Sauvignon, Pinot noir (total 13 protocols).

Farming animals' genetic resources

The genetic fund of Farming animals includes breeds developed in the country and introduced from abroad. The genetic fund of Farming animals includes breeds developed in the country and introduced from abroad. The Scientific and Practical Institute of Biotechnologies in Animal Breeding and Veterinary Medicine provide research activity on animal breeding.

http://agriculture.cia.md/tevit/.

The total breed variety refers to the following:

- beef breeds such as Baltata cu negru, Simmental, Jersey, Rosie de stepa, Rosie Estona, Holstein, Ayrshire, Charolaise and Hereford;
- horse breeds – Orlov, Don, Vladimir of traction, mule, Singe Pur Englezasc, Arabic origin, ahal-techin, poney;
- porcine breeds are represented by: Estoniana de-bacon, Big White, Landrace, Ukrainian steppe White, Tip Moldovenesc de carne, Duroc and Hampshire;
- sheep breeds – Karakul, Tigae, Friza, Latona cu cap negru, Suffolk;
- goat breeds – Saanen, French alpine, Angora;
- rabbit races – Uriasul alb, Uriasul sur, Chinchilla mare, California;
- chicken breeds – Leghorn, Git Golas Moldovenesc, Argintie de Adler, Kucino, Rhode Island, Plymouth Rock, New-Hamshire, Cornisch;
- turkey breeds – Bronzata cu pieptul larg. Alba cu pieptul larg, Bronzata Nord-Caucaziana and Bibilici;
- goose breeds – Holmogor, Italian white, Cuban and Chinese;
- duck breeds – Pekin, Oglinda, Sur Ukraineana, Lesasca;
- fish species – carpus, carasus, carpus of Asia, polyodon spathula (Walbaum).

http://madrm.gov.md/sites/default/files/Raport%20SNDAR%202

Biosafety

Regulatory measures

- A new Law on Genetically Modified Organisms has been drafted in line with the EU Directive 18/2001 in accordance with the EU-Moldova Association agreement. The draft law has been submitted to the Parliament for approval.

https://gov.md/sites/default/files/document/attachments/intr08_63.pdf

- The Nagoya-Kuala Lumpur Supplementary Protocol on Liability and Redress has been ratified by the Law nr. 96 of 06.07.2018

http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=376280

- The GD no. 603 of 20.05.2003 regarding the National Commission for Biological Security was modified by GD no. 189 of 28.02.2018 in order to comply with the provisions of art. 6 of the Law no. 755 of 21 December 2001 on Biosafety.

Detection laboratory

Laboratory on Molecular Biology of the National Agency for Food Security of the Ministry of Agriculture, Regional Development and Environment has been accredited to provide the GMOs testing and detection (ISO 17025).

http://www.ansa.gov.md/
http://oficial.md/actual/oficial-laboratorul-de-biologie-moleculara-pentru-determinarea-organismelor-modificate-genetic-lansat

Decision making

The National Biosafety Committee has approved three GM lines of soybean groats for FFP use as feed for poultry companies in Moldova in 2016. The risk assessment procedure has been respected for the decision making.

http://bch.cbd.int/database/results?searchid=722042.

BCH national website has been updated with relevant national information and accessible for decision makers and stakeholders, inclusive large public. *www.biosafety.md*

Reporting

The Third National Report on the Implementation of the Cartagena protocol on Biosafety has been prepared and submitted to the BCH portal. *http://bch.cbd.int/database/record*. shtml?documentid=109119.

Training

The Biosafety Office of the Ministry of Agriculture, Regional Development and Environment serves as the training and consultancy center in the field of Biosafety. Due to the availability of the financial resources, a number of trainings and workshops has been organized for various stakeholders in the reporting period. See Target 1.

University courses the Biosafety and sustainable development and the Genetically Modified Organisms are part of the Molecular Biology curricula for MSc degree at the Faculty of Biology and Soil Sciences of the State University of Moldova (2014-2018).

CBD "Eastern European Regional Course on Integrative Impact Assessment of LMOs under the Cartagena Protocol on Biosafety: Advancing LMO assessment: Principles, Practice and Progress" held in Chisinau, Moldova, 3–8 February 2014.

Polyommatus bellargus (Rottemburg, 1775)

http://bch.cbd.int/database/record. shtml?documentid=105414

A draft roadmap on integration of biosafety issues into sectorial policies and regulations in Moldova was agreed between the environmental, agricultural, health care, research and development and other sectors with the support of the CBD/CPB/UNEP project, entitled "Capacity-building to promote integrated

implementation of the Cartagena Protocol on Biosafety and the Convention on Biological Diversity at the national level" (2016).

Global Workshop on integrated implementation of the Cartagena Protocol on Biosafety and the Convention on Biological Diversity, 31 October – 4 November 2016, held in Chisinau, Republic of Moldova.

https://www.cbd.int/meetings/BSMBWS-2016-02.

Current legal framework on Biosafety

- Law No. 755-XV of 21.12.2001 on Biological Safety
- GD no. 197 of 25.02.2003 on the designation of the national liaison authority with the Secretariat of the Cartagena Protocol on Biosafety to the Convention on Biological Diversity;
- GD no. 603 of 20.05.2003 on the National Commission for Biological Safety;
- GD no. 1153 of 25.09.2003 on the approval of the Regulation on the authorization of activities related to the production, testing, use and commercialization of genetically modified organisms, etc.

Sustainable Development Goals

The activities under the ABT 13 have an important role to achievement of the global SDG 2 goal, in particilar to ensure food security, maintain genetic diversity of seeds, cultivated plants and domesticated animals and their related wild species, promote access and benefit sharing from the utilization of genetic resources.

Clematis integrifolia.

Target 14. Essential ecosystem services

The NBSAP for 2015–2020 stipulates a number of activities to build capacities for development of ecosystem services and mechanisms to ensure conservation of natural ecosystems. The Specific Objective D – Ensuring measures of increasing of benefits from use of natural resources and ecosystem services is focused to undertake measures for establishment of legal, financial and procedural mechanisms for ecosystem services.

EU-Moldova Association Agreement require to have a clear objectives relevant to ES, such as: (i) reduction of anthropogenic pressure on natural ecosystems, ((ii) reduction of pollution, (iii) increase of areas and efficient management of protected natural areas, (iv) increase of forest areas, (v) better management of aquatic ecosystems and wetlands, etc.

The draft Moldova 2030 Strategy is being developed. By approving the Strategy, the Moldovan Government will have a visionary document of strategic and qualitative strategic planning, on the basis of which development priorities will be established at the sector level and which will guide the allocation of budgetary and institutional resources. This will allow the country to implement effectively the Agenda 2030 for Sustainable Development and the Association Agenda, contributing to the dynamic, sustainable and inclusive development of the country. Among the specific objectives of the Strategy there are listed: Improvement of water and soil quality by reducing pollution from wastewater discharge into or out of the natural environment, minimizing the discharge of chemical and hazardous substances and reducing untreated wastewater; Significant increase areas of reforested land; Ensure climate change resilience by reducing the risks of climate change and by facilitating adaptation in six priority sectors – agriculture, water resources, health, forestry, energy and transport.

https://cancelaria.gov.md/ro/advanced-page-type/snd-moldova-2030

However by present there is no legal framework developed to ensure ecosystem services in the country yet.

In the period of 2014–2018 a number of studies on ecosystem services has been developed in Moldova.

1. A Study on The Economic Value of Ecosystem Services in Republic of Moldova, 2014 has been carried out with the support of the UNDP/GEF project "National Biodiversity planning in Moldova", and channeled the following aspects: (i) assessment of ecosystem value of some protected areas; (ii) assessment of value of ecosystem services provided by sectors (eco-tourism, forest sector, agriculture, water supply and fishery, natural disaster and climate change).

http://chm.biodiversitate.md/information/document/Economic_Value_of_Ecosystem_Services.pdf

2. Forestry Sector and Ecosystem Services – ENPI FLEG II in the Republic of Moldova, 2017.

http://www.biotica-moldova.org/library/FLEG2017.pdf

3. Evaluation of Forestry Ecosystem Services in the Republic of Moldova, 2015.

http://www.enpi-fleg.org/site/assets/files/1872/fes_moldova_2015_ro.pdf

4. Report on Evaluation of Ecosystem Services in the Soroca District, 2018.

http://www.md.undp.org/content/moldova/ro/home/library/climate_environment_energy/raport-privind-evaluarea-serviciilor-ecosistemice-in-raionul-sor.html

5. Report on the Evaluation of Ecosystem Services in the Stefan-Voda District, 2018

http://www.md.undp.org/content/dam/moldova/docs/Stefan%20Voda%20SES%20final.pdf

6. Estimates of ecosystem service losses following illicit cutting in the Republic of Moldova, 2016

http://www.biotica-moldova.org/library/Ecosystem_services&Illegal_cutting_Assessment_ROM.pdf

Ecosystem services values

The value of ecosystem services in tourism, forestry, agriculture, fishing, water supply, climate change and disaster mitigation are estimated at just under $21,986 million in 2011. In 2011, the quantified value of ecosystem services (taking only few sectors into consideration) equated to some 41% of GDP.

Both public sectors and private sector benefited from ecosystem services values. For example, for eco-tourism sector, 13% of the value was earned by the national budget, while 78% (4.6 mills USD) was earned by private enterprises. In agriculture sector, only 11% of the benefits were earned by the budget (425 mill USD) while the private sector earned 86%.

The income, consumption, spending, employment and cost-savings generated by ecosystem services have wide-ranging knock-on impacts on the economy. For example, only eco-tourism sector generate total income, investment and spending in the tourist sector of $7.9, including capital investment in excess of $1.4 million, as well as some 1400 full-time job equivalents.

Eco-touristic visitors are, for example, willing to contribute almost $0.6 million a year more than they are currently being charged as entry fees. Another example is from agriculture: due to under usage of pastures (under the carrying capacity) there is an untapped potential of $127.7 mills. Increased public investment and policy action is required to capture these potential revenue streams.

The PAs received around $2.8 million in funding in 2011 (state budget funding – $67,950; Own revenues – $1,126,300; Forest Enterprises – $1,600,000), while $3,7 million is considered to be necessary to meet basic needs and around $4,4 million the optimal needs. Continuing to carry out "business as usual" may cost Moldova's economy and population more than $1,883.33 million over the next 25 years.

Choosing to "invest in natural capital" may create a steady, and increasing, value-added to Moldova's economy and population over continuing "business as usual", generating incremental benefits worth more than €$1,883.3 million over the next 25 years.

For example if the illegal fishing will disappear the value added to the economy by fishing sector and related industries may double in 25 years with the same budgetary investment, meaning an added value of $26.9 mills.

If the upstream protection functions of the ecosystems of ecosystems serve to minimize the impact of disaster by 10% below what it would have been in the absence of the protective functions, then the ecosystems' value of flood control in terms of avoided damage costs equates to an average of $13.4 million a year – 19.7 million a year based on a damage cost avoided and preventative expenditure approach respectively. Fig. 31.

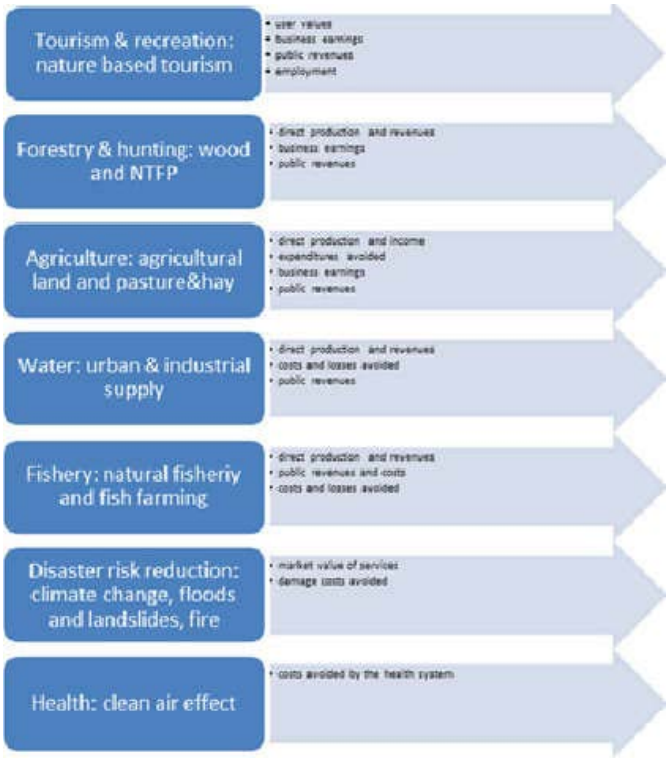


Figure 31. Accepted sectors and data for the evaluation of Ecosystem Services

Ecosystem services in Soroca and Stefan-Voda districts

The Study of economic value of ecosystem services for Soroca and Stefan-Voda districts was developed project “Mainstreaming biodiversity conservation into Moldova’s territorial planning policies and land use practices”:

Agriculture.

The surface of the current agricultural land in Soroca District is approx. 8394.10 ha, the value of annual ecosystem services surprised by national statistics plays around. $2.6 thousand / ha. In Ştefan Vodă district the area of agricultural land is 78483 ha, the value of the ecosystem services provided by the national statistics is around approx. $2.2 thousand / ha.

Silviculture

The wooded area of the Soroca district covers a territory of 7250.75 ha and in the Stefan Voda district it occupies an area of 7336.56 ha. The value of ecosystem services in the Soroca district is approx. $2.48 thousand / ha per year, while in Stefan Voda District it is approx. $2.6 thousand / ha per year.

Tourism

The Soroca district is visited by approx. 129.4 thousand people, the southeastern area of the Republic of Moldova is visited annually by over 1.3 mln. People. There is a need for ecosystems to increase the flow of tourists by at least 2% in both districts.

Aquatic resources

In Soroca district, the land covered by water represents 2.09% of the total area, while in the Stefan Voda area, the water-covered terrains represent 3.91% of the total area.

The value of annual ecosystem services surprised by national statistics and estimated by specialists is around approx. $11.9 thousand / ha in the Soroca District and approx. $5.97 thousand / ha in the Stefan Voda district.

Valorouse natural ecosystems in Moldova

The territory of the Republic of Moldova is composed of two main biogeographic zones: Continental and Steppe. The Continental zone is formed mostly with the forest ecosystems an is located in the northern and central parts of the country. The Steppe zone is located in the South and South-East of the country. Agricultural and urban ecosystems comprise almost 85% of Moldova’s territory, while natural and semi-natural ecosystems – about 15%. The main natural ecosystems of Moldova are: (i) the forest (11.2%), (ii) the steppe (1.9%), (iii) aquatic areas (2,85), (iv) petrified habitats (0.68%). Fig. 32.

Forests are the richest in Moldova in terms of biodiversity. Herbaceous herb communities under the canopy are significantly influenced by shading and range from 79 to 206 species; the woods and the edges of forests accommodate about 800 species, especially those characteristic of the steppes and meadows. Approximately 500 plant species are typical for forest habitats, 172 of which are rare and 103 are under state protection. In forest ecosystems there are about 40 species of relic plants. Fig. 33.

The steppes now occupy only 1.9% of the territory and are the least conserved ecosystems in Moldova, although they occupied some 60% of the country’s territory. Now the remains of the primary steppes

are reduced, fragmented and largely used for grazing. Existing steppe habitats host 420 species of plant species, of which 126 are threatened with extinction and 2 have a very limited spread.

Meadows (10% of the country's territory) hosts 269 plant species typical of these ecosystems. 52 species present in the meadow ecosystems are threatened with extinction and 29 of them are under national protection.

Agriculture

The value of the provisioning service food for the ecosystems in agriculture is estimated at around $21,900.6 million in 2011.

The carrying capacity in under – used and SEM implies a decrease fall in the value of food provided by pastures in the short and long term. However, the annual values after 10–15 years are significantly higher than the BAU values. In addition BAU also sometimes results in irreversible damage to ecosystems. The SEM scenario might lead to a significant increase in vegetal production due to value added by the ecological products.

A continuation of BAU in terms of agriculture could cost Moldova's economy some $10,695.784 million over the next 25 years (this is based on the cumulative value of SEM relative to BAU). Ecosystem Services in Agriculture sector for 2011 is represented in Fig. 34.

Aquatic ecosystems/wetlands are habitats for species of aquatic plants, including those included in the Bern Convention lists. In wetlands there are important concentrations of invertebrate species, some rare mammalian species. During the last 10 years agricultural land increase with 57 thousand ha (or 2.87%), the water ecosystems are decreased by 600 ha (or 0.7%). The most affected are water basins, which covered 2.52% of the territory of the country, remaining among the most vulnerable ecosystems. Fig. 35.

Forest ecosystems have increased in recent years by 8 thousand ha, reaching 13.35% of the total land fund of Moldova; the national target is 15%. The hardwood forest cover 93.68% and the softwood forests have about 16.9 thousand ha. However, due to planting of acacia species (over 40% of the forests), the original composition of forest ecosystems has been modified.

Human intervention on services provided by different ecosystems in the Republic of Moldova

Ecosystem services	Forestry	Steppes	Wetlands	Aquatic ecosystems	Rock ecosystems
Support services					
soil formation	Enhancing wooded areas	Reduction of surface, agrocenoses fertilization with chemicals	Decrease the surface	Cutting and unstable flows	Stone extraction (soil support)
photosynthesis and cycle of nutrients	Enhancing wooded areas	Reducing the surface and biodiversity	Reducing the surface and biodiversity	Cutting and unstable flows, diminishing biodiversity	Destruction of green layer, reduction of biodiversity
Supply services					
food	Growth of biomass, hunting	Converted into agrocenoses, impoverished biodiversity	Resources depleted for animal nutrition, hunting	Depleted fisheries resources	Depleted biomass resources
the water	Water retention	Enhanced water use, increased chemical pollution	Containment of the surfaces, the captured water is removed when irrigating other lands	Reduce the amount of water	The deforestation stimulates the evaporation and advanced degradation of the biotope
wood and biomass	Legal / illicit cuts outweigh the increase in biomass	Increased biomass of agricultural crops	Relatively stable biomass, however affected by wetland dwindling	Relatively stable biomass, affected by the decrease in water volume	Degrading the green layer quickly leads to biotope degradation
Adjustment services					
Natural control mechanisms on climate and precipitation	Enhancing wooded areas	Small fragmentary areas have lost this function	Small fragmentary areas have lost this function	Evaporation from smaller surfaces	Insignificant
surface water	Enhancing wooded areas	Small fragmented areas	Significant	Significant	Small fragmented areas
Waste decomposition	Excessive pollution with household waste	Excessive pollution with household waste	Excessive pollution with domestic and liquid wastes	Excessive pollution with domestic and liquid wastes	Excessive pollution with household waste
The spread of diseases	Stands	Diseases of agricultural crops	Epidemics related to wet phases	Epidemics related to wet phases	Unexplored
Cultural services					
Beauty, inspiration	Most spectacular landscapes	Landscapes with farmland and orchards	Landscapes with stretches of water	Landscapes with stretches of water	Landscapes with harsh forms of relief
Recreation	Enhancing wooded areas	Reduced functions	Resting areas	Resting areas	Areas set up by short stops

* Note: The color mark refers to:
Relatively satisfactory status of human intervention
Stable / insignificant results of human intervention
Negative status mainly due to a non-environmentally friendly anthropogenic influence

Figure 32. The potential of ecosystem services and the link with the production sectors

Ecosystem services– Forestry ($/ 2011

	Value ($)	%
PA authorities	1002714	3,538669
Budget + Moldsilva	18001866	63,53026
Private sector	9331315	32,93108
	28335895	100

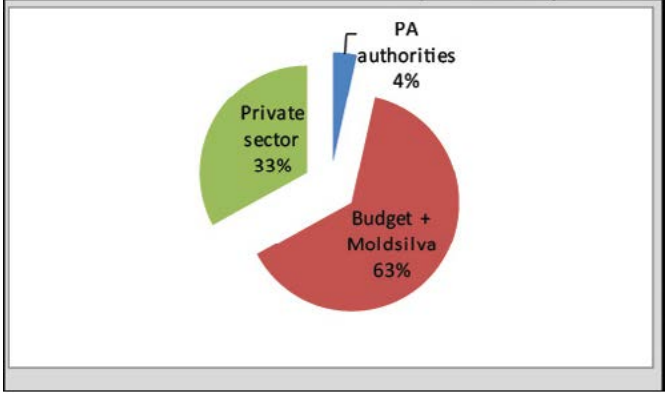


Figure 33. The potential of ecosystem services in subsistence farming

During the period of 2011–2018 the forest area has been extended by planting forest on the degraded lands, protected areas increased, and forest, pasture and wetlands restoration measures for has been applied. See Target 11, 15.

UN Biodiversity Lab:

Ecosystem Services for Moldova – EcosystemServiceUsage_MDA.png

Sustainable Development Goals

The activities under the ABT 14 have an important role to achievement of the global SDG goals, in particilar to the SDG 1, 3, 5, 6, 8, 13, 15. The Activities are contibuted to reduce poverty of the population, reduce ilness from hazardous chemicals and pollution, to ensure women participation and equal opportunities, to ensure efficient water-use, to improve consumption and production, strenthen resilience and adaptive capacity to natural disasters, by 2020 to integrate ecosystem and biodiversity vaues into national development planning.

Agriculture - ecosystems

	Value ($)	%
Budget	425961885	10,65216125
Private sector	3445162511	86,15424961
Non comercial users	127706220	3,193589133
	3998830616	100

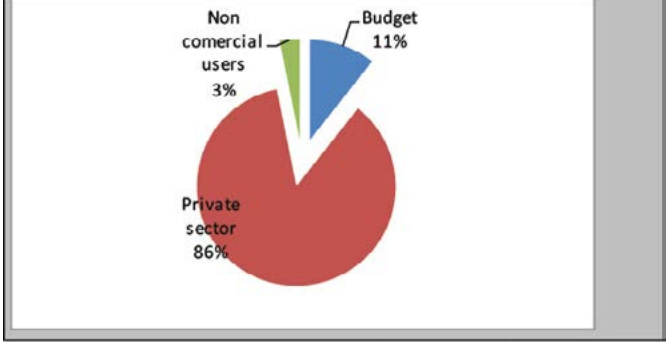


Figure 34. The potential of ecosystem services in agriculture

Fishing sector

Indicators	Value	%
Government	3284399,761	23,36390822
Private sector (including illegal fishing)	10773178,84	76,63609178
	14057578,6	100

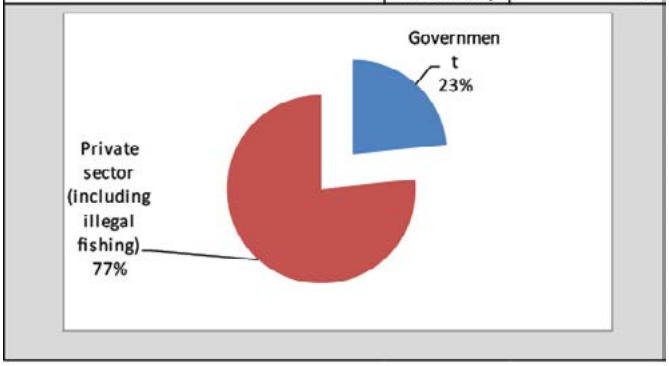


Figure 35. The potential of ecosystem services in fish farming

Target 15. Ecosystem resilience

Policy framework

The Action plan of the NBSAP for 2015–2020 stipulates a number of actions to provide afforestation and extend the surface of forest to 15,0% of the territory of the country, to extend protected areas fund to 8,0%, to increase the forestry strips system in agricultural lands, to provide forest regeneration etc.

The National Strategy for Sustainable Development of Forestry Sector stipulates rules for forest development, regeneration, afforestation and maintenance, sustainable use of forest resources.

The wetland Etulia village

The draft National Program on Adaptation of Forestry Sector, 2001 has been elaborated under the National Strategy on Adaptation to Climate Change. The mentioned Program is focused to ensure the forest resilience, adaptability and stability of forest ecosystems to prevent negative effects of climate change.

The capacity of Moldovan forests to absorb carbon dioxide from the atmosphere is about 2,230 thousand tons per year.

GD No. 1186 of 28.10.2016 for the approval of the Performance Regulation on afforestation of degraded land plots of property public administration and private property. The forestry enterprises subordinated to Moldsilva Agency carry out planting works and in the framework of the National Plan for Extension of Areas with Forest Vegetation for 2014–2018, stipulating the afforestation of degraded lands, rivers protection strips and water basins as well as forest strips for the protection of agricultural land on an area of at least 13 thousand ha.

Ecosystem restoration and resilience

In the recent years the forest fund increased by approx. 8.0 *th.ha*, reaching 13.35% of the total territory of Moldova.

In the period 2010–2018 in the Republic of Moldova the total 12,583 ha of new forestry plantations were created, including 9,478 ha in the state forestry fund and 3,060 ha outside the forest fund. They have been develpd both in projects with international participation and with their own forces.

The forest regeneration measures in the State Forestry Fund have been provided annually approx. at 3–5 th. ha of forest. Extension of the state forestry fund has taken on approx. 100 ha annually. Forest regeneration activity undertaken by the Moldsilva Agency in 2011–2016 reached the territory 26,069 ha.

The restoration of the pastures in the Orhei National Park with the support of the European Union has contributed to the improvement of the life of the people in the region. Total 500 hectares of pastures from Orhei National Park are restored and maintained to generate a high quantity and quality of feed. At the same time, this will alleviate soil erosion and reduce greenhouse gas emissions. It was supported through the “Clima East” project, implemented by the UNDP.

http://www.calm.md/libview.php?l=ro&idc=34&id=2844&t=/SERVICIUL-PRESA/Noutati/500-de-hectare-de-pasuni-din-raionul-Orhei-sunt-reabilitate-cu -spriijinul-European-Union/

The project "Soil Conservation in Moldova" 2000–2022 supports the rehabilitation and conservation of soils by afforestation of 20.3 thousand hectares.

http://icas.com.md/activitati-2/projects-international-in-derulare/

The project "Development of the communal forestry sector in Moldova", 2006–2035, promoted by "Moldsilva" Agency in collaboration with the BioCarbon Fund, for the creation of new communal forests on the area of 9,400 ha, by afforestation of eroded and non-productive land.

- Grant provided by the Government of Japan "Community Support Program for Sustainable and Integrated Forest Management and Carbon Seizure Management through Afforestation", 2010–2014, contributed to achieve the sustainable management through plantation of forest vegetation on 1,453 ha, including 1162 ha of forests and 291 hectares of reconstruction /relief /replenishment works for the regeneration of forests.. Also within the mini-projects, improvement is envisaged through various methods of about 608 ha of communal meadows.

http://icas.com.md/activitati-2/proiecte-internationale-in-derulare/amp.gov.md/contentrepository/downloadFile.do?uuid=0c9359f5-a96f-4bbd-bde7

In the period of 2014–2017, the Biotica NGO has provided restoration work and afforestation of wetlands area of the Nistru de Jos Ramsar area on the territory of total 85.7ha in the limits Talmaza and Ciobruci settlements with the support of the projects "Improvement of Water Resources Management and Protection of Ecosystems in the Ramsar Area Nistru de Jos " and "Adaptation and Resilience Measures to Climate Change and Institutional Development in the Ramsar Area Nistru de Jos ".

http://www.biotica-moldova.org/md/index.htm

Total area of the planted forest, regenerated forest, pasture and meadow (wetland) ecosystems is 50,066 ha or 1,48% of the territory of the country.

UN Biodiversity Lab *https://unbiodiversitylab.org/*:

- Map of Carbon Storage in the Environment for Moldova, 2018 – CarbonStorageInTheEnvironment_MDA.png
- Map of Carbon Storage of Protected Areas – Carbon Storage PA.png. Total Above Ground Biomass – 256,851 Mg/ha in 2018. Total Soil Organic Carbon – 391125 Mg/ha.
- Map of Carbon Sequestration Potential for Moldova – CarbonSequestrationPotential_MDA.png

Sustainable Development Goals

The activities under the ABT 15 have an important role to achievement of the global SDG goals, in particular to the SDG 6, 9, 11, 13, 15. By 2030 substantially increase water-use efficiency, protect water related ecosystems, including forest, wetland, rivers and lakes; decrease economic losses caused by disasters, strenghten resilience and adaptive capacity to climate change and disasters, ensure conservation, restoration and sustainable use terrestrial and inland water ecosystems.

Target 16. Nagoya Protocol on ABS

Legal provisions

In 2016 Moldova has ratified the Nagoya Protocol on Access to Genetic Resources (ABS) and the Fair and Equitable Sharing of Benefits Arising from their Utilization to the Convention on Biological Diversity by the Law nr. 117 of 02.07.2016.

http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=365668

The National Biodiversity Strategy and Action Plan for 2015–2020, approved in 2015 and contain provisions for the implementation of the ABS procedures according to the Protocol.

https://absch.cbd.int/en/database/MSR/ABSCH-MSR-MD-238611/1

Measures to be undertaken under the NBSAP Action Plan 2015-2020:

1. Development of financial tools and mechanisms for equitable sharing of benefits arising from using genetic resources.
3. Implement the requirements of the International Treaty on Plant Genetic Resources for Food and Agriculture of the Commission of Genetic Resources for Food and Agriculture under FAO –
4. Conduct a study on access to genetic resources and equitable sharing of benefits from their use (according to the recommendations of Nagoya Protocol).
5. Encourage activities for the maintenance of domestic genetic breeding stock.
6. Implement the requirements of the International Treaty on Plant Genetic Resources for Food and Agriculture of the Commission of Genetic Resources for Food and Agriculture under FAO.
7. Promote valuable plant genotypes for the purpose of establishing industrial plantations.
8. Develop a project for local communities based on sustainable management of plant resources (energy, medicinal, feed, essential and oleaginous oils etc.)
9. Develop a program for the genetic improvement of honeybees.

Oryctes nasicornis (Linnaeus, 1758)

The National Focal Point as provided in Article 13 has been appointed.

https://absch.cbd.int/en/database/NFP/ABSCH-NFP-MD-2291.

The existent information on ABS is available to the ABS Clearing-House as provided in Article 14.2.

https://absch.cbd.int/countries/MD.

Moldova has submitted the Interim National Report on ABS to the CBD Secretariat.

https://absch.cbd.int/countries/MD.

There is no specific legislation on access to genetic resources and the benefit-sharing at national level at present.

Overview on existing domestic provisions on conservation of genetic resources

To be mention, the existent domestic legislation in the field of nature conservation, intellectual property rights, agriculture plant varieties, horticulture, seeds varieties etc. contains specific provisions that are related to genetic resources. The existent national legislation has provided the encouraging mechanisms for research activities in the field of genetics, biodiversity conservation and monitoring.

Ex., the Law on Vegetal Kingdom (amendments to the law approved on 27.10.2017) stipulates some measures relevant to commercialization of genetic resources to a country of export, ex-situ and in-situ collections of plant species etc.

https://absch.cbd.int/database/MSR/ABSCH-MSR-MD-238631/1

The Law on Animal Kingdom provides rules for maintenance of collections of fauna species, as well as export/import requirements in accordance with the CITES provisions in economic, scientific, cultural and educational and esthetic scopes.

https://absch.cbd.int/database/MSR/ABSCH-MSR-MD-238623/1.

Ex-situ Genetic Collection of Plant species

The ex-situ conservation of spontaneous or ameliorated, domestic or introduced species, including those threatened, is carried out through collections of research institutions, botanical gardens, dendrological parks, universities and personal collections of scientific researchers.

The Botanical Garden (Institute) A. Ciubotaru holds important collections and exhibitions of spontaneous plants and ameliorated with a Genetic fund of about 7.5 thousand taxons. More than 100 species of rare plants from the spontaneous flora of the Republic of Moldova are stocked in the field's live collections, 54 of which are included in the 3rd edition of the Red Book.

The total plant Genetic fund is about 11 thousand species, of which: tropical and subtropical plants – 2,517, ornamental floral plants – 1,150, wood plants – 2,000, non-traditional agricultural plants – 350, herbs – 300, aromatic plants – 350. In the last years, the plant Genetic fund of the Botanical Garden (Institute) A. Ciubotaru was completed with 1,456 species including: wood plants – 170, floral plants – 601, tropical and subtropical plants – 439, medicinal and aromatic plants – 148, forage plants – 98. The largest herbarium collection is located in the Botanical Garden (I) A. Ciubotaru, which currently has a heritage of about 188 thousand herbaceous specimens (plants and mushrooms).

http://www.gradinabotanica.asm.md/node/31

The Botanical Garden of the Museum of Ethnography and Natural History includes exhibition, representing main types of forest, steppe, aquatic and palustric vegetation on the territory of Moldova, including rare and endangered plants and trees. Its herbarium collection contains most of rare plant species of spontaneous flora, including of the Red Book. The herbarium of the State University of Moldova, the second largest herbarium in the Republic of Moldova, consists of 90,000 plant specimens, including 100 rare plant species. The scientific reserves "Codrii", "Plaiul Fagului" – own about 400 plant specimens, including 30 species of rare plants.

The existing dendrological parks and gardens in the Republic of Moldova (21 parks with a total area of approximately 300.5 ha) are taken under state protection by Law no. 1539 of 25.02.1998 on Nature Protected areas Fund, maintain a collection with rare plant species of alien and autochthon flora.

Forestry Seed collection

The National Forestry Agency Moldsilva ensures the Seed Forestry, according to the latest Order of the Moldsilva Agency, no. 350 of December 22, 2017, on review, approval and updating of the sectors of seed collection fund, the Seed collection fund consists of 242 arboretum units and 79 trees for forestry seed production. The total area of the units is 3924.4 ha.

Zoological Collections:

Entomological Museum of the Institute of Zoology, which includes about 100,000 exemplars of insects of 10,000 species.

http://www.zoology.asm.md/category-21-0-0-ro.htm.

Sympetrum meridionale (Selys, 1811)

Museum of Fossil Faunistic Complexes of the Institute of Zoology. The museum maintain a collection of over 50,000 fossil mammalian pieces (bison, rhinoceros, antelopes, hippies, elephants, deer, hyenas, giraffes, rodents, insectivores etc.), birds (ostriches, prey), reptiles (snakes, turtles) and invertebrates – ostracods, mollusks, foraminifers. The age of exhibits is between 50,000 and 16 million years.

http://www.zoology.asm.md/category-21-0-0-ro.htm

Museum of Natural Sciences of the State University of Moldova.

https://www.facebook.com/652227924822910/posts/muzeul-de-%C5%9Ftiin%C5%A3e-naturale-al-usm/724029854309383/.

Zoological collection includes about 14,000 of vertebrates and invertebrates species. Botanical collection (herbarium) – around 100,000 of exhibits. The fresh water Algae species collection include 1,539 species.

www.algae.md https://www.youtube.com/watch?v=BkEP5H1GaCs.

National Museum of Ethnography and Natural History of Chisinau It contains a collection of plants, vertebrate and invertebrate animals, fossil exhibits. The museum includes more than 10,000 exhibits, of which 5800 beetles and 3600 butterflies.

http://www.muzeu.md/.

Codrii Scientific Reserve, “Museum of Nature”.

http://codrii.silvicultura.md/ http://codrii.silvicultura.md/pageview.php?l=en&idc=135&t=/Turism/Muzeu&.

The Museum’s Patrimony maintain a collection of about 500 exhibits: 34 mammalian species, 88 bird species, 9 reptile species, 9 amphibian species and 364 species of insects.

Zoo Garden of Chisinau.The collection contains: bears, feline, dog-enot, European otter, European wolf, steppe wolf, common fox, antelope, zebra, camel, wild bar, kangaroo, Siberian goat, European mouflon, blade, pig (Indian), nutria, pelican, marabou, goose, swan, peacock, mandarin etc.

http://www.zoopark.md/en/

Animal Breeding Farm. The Bardar Zooclub was the first ostrich breeding farm, and over the years it has been developed in a livestock breeding business, reaching today with a large collection of domestic and

exotic animals such as ostrich, horses, pony, goats, sheep, alpaca, kangaroo, pigs, pheasant, swans, pumped, quail, crowned corners, rabbits, etc.

http://www.zooclub.md/

Microbiology collection:

The Institute of Microbiology and Biotechnology maintains the National Collection of Non-pathogenic Microorganisms, which has stored 28 strains of microorganisms from different systematic groups.

http://imb.asm.md/index1-0-0-0-ro.htm

Sustainable Development Goals

The activities under the ABT 16 have an important role to achievement of the global SDG goals, in particilar to the SDG 3, 8, 15. By 2030 reduce ilnesses from pollution and contaminations, improve resource efficiency in consumption and production, promote fair and echitable sharing of the benefits arising from the utilization of genetic resources and promote access to such resources.

Target 17. NBSAPs

The Republic of Moldova approved the Strategy on Biological Diversity of the Republic of Moldova for the years 2015–2020 and the Action Plan for its implementation through the Government Decision no. 274 of 18.05.2015.

Taking into account the overall strategic goals, Strategy aims at integrating the CDB provisions at national level through:

1) creating an institutional and legislative framework to help stop the loss of biodiversity;
2) conservation of flora and fauna species;
3) sustainable extension and management of state-protected natural areas;
4) protecting genetic resources and sharing the benefits of using them;
5) creating mechanisms for ecosystem services;
6) Mobilizing resources for biodiversity conservation.

The overall objective of the Strategy is to reduce the current rate of biodiversity loss as a contribution to poverty reduction and to benefit all forms of life on Earth.

By adopting the Strategy, the Republic of Moldova proposed in the medium term 2015–2020 5 specific objectives and 15 action lines, linked to the requirements of the CDB Strategic Biodiversity Plan 2011–2020, the Strategic Plan for Cartagena Implementation of the Biosafety Protocol for 2011–2020, the EU Strategic Plan for the CDB by 2020 and the Aichi Biodiversity Targets.

Sympetrum meridionale (Selys, 1811)

Implementation measures of the Strategy are classified in two stages:

a) Stage I covers the period 2015–2017, when the institutional mechanisms and structures for the improved environment management in the Republic of Moldova were implemented and approved the new political and legislative / normative framework, in line with the provisions of the EU Directives in the field;
b) Stage II covers the period 2018–2020, when the results of the implementation of this Strategy are to become evident by creating conditions for improving the quality of the components of biological diversity, reducing health problems and sustainable management of natural resources for sustainable development country.

The Action Plan for the implementation of the Strategy involves the following Strategic Objectives:

- Specific objective A. Ensuring sustainable management and effective institutional framework in the field of biodiversity conservation by 2020.
- Specific objective B. Reducing the pressure on biological diversity to ensure sustainable development
- Specific objective C. Implementing, by 2020, measures to halt threats to biodiversity
- Specific objective D. Ensure measures to increase benefits from the use of natural resources and ecosystem services

– Specific objective E. Ensure scientific support in the field of biodiversity conservation, access to information and the promotion of education for sustainable development.

The specific objectives of the Action Plant are in line with all AICHI Biodiversity Targets, except the Target 3 on Incentives and Target 18 on Traditional knowledge.

The main actors that have been involved in the preparation and implementation of the NBSAP are representing the environmental, forestry, agricultural, health care sectors, academic research and university sectors.

The Action Plan of the implementation of the Strategy contains specific indicators for each planned activity.

The total number of planned activities is 96. By present over 50% of the planned activities are implemented or partial implemented.

Among the main barriers or obstacles of non-implementation of some activities are: Insufficiency of financial capacity, human resources and institutional constrains.

Sustainable Development Goals

The activities under the ABT 17 have an important role to achievement of the global SDG goals, in particilar to the SDG 5, 16, 17 to ensure women's effective participation and leadership, ensure responsible participatory and representative decision making, support national plan implementation of all sustainable goals.

Target 18. Traditional knowledge

Traditional knowledge is not among the National Biodiversity Targets by present. There are no any legal provisions or institutional setting that ensures the involvement of the indigenous people and local communities in the environmental protection and biodiversity conservation programs. The traditional knowledge are not being considered and supported by the governmental activities yet. This is a target for the future development. The National Biodiversity policy is expected to include the traditional knowledge as part of biodiversity conservation priorities while the future revision and approval.

Nistru river at Olăneşti village

Target 19. Biodiversity knowledge

Scientific research projects

The Botanical Garden (Institute) Alexandru Ciubotaru conducts research on the following research themes

http://www.gradinabotanica.asm.md:

1. Research on vascular flora and macro-micobiote of the Republic of Moldova and the neighboring territories, evidence of the taxonomic composition.
2. Research of the vascular flora and the adjacent territories, identifying the taxonomic composition for elaborating the Red Book and editing the monograph "Flora Basarabiei".
3. Researching the floristic and phytocenotic diversity of the protected natural areas in order to elaborate recommendations for the optimization of conservation of the diversity of the plants.
4. Forest and steppe vegetation research to identify valuable areas and develop recommendations for the extension of the Natural Protected Areas of the Republic of Moldova.

The Institute of Zoology has conducted research on biodiversity in the fields of:

1. The phenomenon of "biological invasions" has been investigated, in special invasive alien entomofauna.
2. Diversity, structure and functioning of natural and anthropogenic faunistic complexes in the context of strengthening the national security strategy of the Republic of Moldova.
3. Establishment of structure, functioning, tolerance of hydrobiont communities and development of scientific principles of aquatic ecosystem bioproductivity management.

http://www.zoology.asm.md

Natural eutrophic lake with free floating vegetation

The Institute of Ecology and Geography conducted research on:

1. Impact of natural and anthropogenic factors on geo- and ecosystems on the territory of the Republic of Moldova in order to improve the management of natural resources and the preservation of representative areas.

http://www.ieg.asm.md/en/about_ieg

2. Developed and drafted of the "Hydrographic Basin Management Plan" for Cycle I, 2017–2022, in accordance with Directive 2000/60 / EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for Community action in the field of water policy; and Water Law no. 272 of 23.12.2011.
3. Integrated Assessment of Anthropogenic Impact on Representative Ecosystems for the Conservation and Extension of State Protected Areas in the Context of the Requirements of the EU Directives.

The Institute of Forestry and Management carries out research on development and maintenance of the forestry fund in the Republic of Moldova. *https://icas.com.md/*:

1. Researches in the field of floristic diversity in forest ecosystems (in protected areas) in the state forestry fund.
2. The state of forest health in the Republic of Moldova based on forest monitoring data for the period 1993–2015.
3. Evaluation of phytosanitary status of the forestry fund of the Republic of Moldova.

Institute of Soil Sciences, Agrochemistry and Soil Protection Nicolae Dimo carries out research on the following research projects:

1. Developed the Program for Soil Fertility Conservation and Enhancement for 2011–2020, approved by the Government Decision no. 626 of 20.08.2011.
2. Alkaline Soil Improvement Technology by Using Calcic and Organic Wastes (Patent MD 1752 G2.2001.10.31).
3. Methods for optimizing the biological status of intensively exploited soils
4. Elaborated Procedures for the use of complex mineral fertilizers (liquid and solid) for the optimization of mineral nutrition of agricultural plants
5. Monitoring the quality of waste water from agricultural raw material processing plants on soil quality and composition of surface and pedo-phreatic waters
6. Elaborated the Process for minimizing soil erosion by cracking and cracking coupled with mud drainage.

http://www.ipaps.md/home/

Ex-situ Collections:

- Entomological Museum of the Institute of Zoology, *http://www.zoology.asm.md/page-1-1-ro.htm*
- National Museum of Ethnography and Natural History of Chisinau, *http://www.muzeu.md/colectii/#*
- Collection of the Moldovan State University Museum (flora and fauna),

https://www.prospect.md/ro/history/muzee-istoria-muzeelor/muzeul-natural-de-istorie-de-la-universitatea-de-stat-din-moldova.html

- The collection of fauna and flora species at the Codrii Scientific Reserve.

http://codrii.silvicultura.md/pageview.php?l=ro&idc=135&t=/Turism/Muzeu

The Botanical Garden has a large plant collections, that play an important role in conserving the vegetation diversity in the Republic of Moldova:

- Flower collection
- The collection of medicinal and aromatic plants

- Fodder plant collection
- The collection of tropical plants
- The collection of fruit, wine and nut plants
- The rare species of Moldavian flora

http://www.gradinabotanica.asm.md/node/31

Please see details on the collections at the ABT 16.

GIS mapping and satellite imagery

The Map of Moldova's Forests developed by the Institute of Forestry and Management and is located on the site. *www.icas.com.md/map* and includes layers with information about:

1. Moldovan forests areas, its structure and indicator species in each forest sector;
2. Parceling of forest sectors;
3. Administrative structure of the Moldsilva Agency and subordinated forestry enterprises. Map of Forestry Vegetation is presented in the Fig. 36.

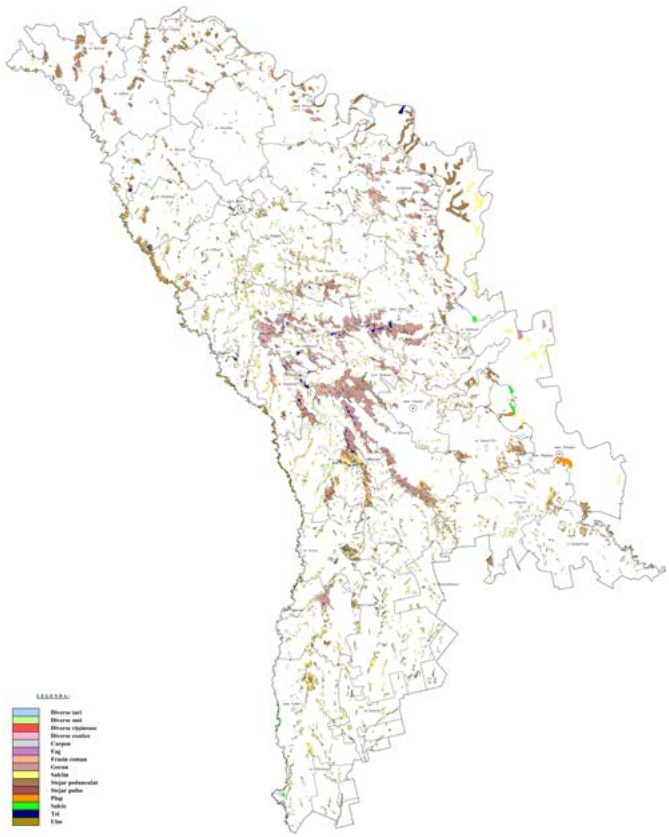


Figure 36. Forest vegetation of the Republic of Moldova

The Map of Natural Protected Areas developed by the Institute of Ecology and Geography and is located on the site: *http://www.ieg.asm.md/ro/node/133*

National Ecological Network of Moldova (NEN) has been developed by "Biotica" NGO and has the following functions:

a. preserving ecosystems, habitats, species and landscapes in a national, European region context, including by preserving and restoring territorial integrity and connections;
b. protecting and raising the quality of vital resources of vital importance for protected species;
c. raising the resistance of agrocenoses and their capacities for restoration due to the agro-ecological influence of NEN elements and better preservation of biological agents;
d. development of the NEN of the biological monitoring system, solving environmental problems at the informational, scientific and practical level. Map of Ecological Network is presented in the Fig. 2 below.

http://www.biotica-moldova.org/library/ECO-net_decision-makers-ro.pdf

Emerald Network is an ecological network made up of Areas of Special Conservation Interest. Its implementation was launched by the Council of Europe as part of its work under the Bern Convention. The Emerald Network in Moldova consist of GIS maps and digital bounders on the following elements: Total Emerald sites – 52, Emerald habitats – 34; total Emerald species: 165 sp., including plant species – 14sp.; total animal species: 151 sp.: mammals – 14sp. birds – 89sp. reptiles – 2sp. amphibians – 3sp, fish – 19 sp. invertebrates – 24sp. Map of Emerald Network is presented in Fig. 3 below.

https://cdr.eionet.europa.eu/md/coltlvaya/coltlvabg/.

UN Biodiversity Lab MapX. The Moldovan Emerald Network map have been integrated into the UN Biodiversity MapX and is available for observation of dynamic of protected areas and vulnerable species and habitats under European protection for future decision making.

https://mvp.app.mapx.org/?project=MX-LW7-15O-8WC-NMS-GA0&language=en&zoom=6.639&lat=47.003000000000014&lng=30.47199999999998

Biodiversity Indicators Partnership for Moldova helps to evaluate the status of protection in the country, assessment of dynamics of factors influenced the state of biodiversity and provide support in the preparation of the National Report 6.

http://bipdashboard.natureserve.org/bip/SelectIndicator.html?iso=MDA&reg=Europe

Data Cube technology for Moldova has been developed with the support of the UNEP Grid Geneva and involve a pilot map platform of the territory of Moldova with connection to satellite imagery and spatial data processing methodology. The Data Cube technology is a cutting edge Remote Sensing technology which allows a new way of storing and analyzing temporal collection of satellite imagery on spatial and temporal dimensions based on open source software that allow to transform raw data into directly available information and knowledge for all kind of users and analysis. The Moldovan Data Cube has been tested by stakeholders from the biodiversity, forest, water management sectors.

http://www.datacube.org.au/

Regional Biogeographic Emerald Network process. Moldova has participated in the European Biogeographical seminars within the Emerald Network project to provide self-assessment of sufficiency of the identified Emerald sites for the endangered species and habitats under the protection of Bent Convention.

https://www.coe.int/en/web/bern-convention/conclusions-of-the-biogeographical-seminars

The Regional Biogeographical Seminar for Moldova, Ukraine, Belarus, and Russia on the creation of the Emerald Network was held in Chisinau,11–13 May 2016.

http://old.mediu.gov.md/index.php/serviciul-de-presa/noutati/2454-reteaua-emerald-din-republica-moldova-este-conceputa-ca-parte-componenta-a-retelei-%20eco-national-and-is-a-part-full-of-network-environment-pan-European

The State Hydrometeorological Service carries out research in the field of hydrometeorology and monitoring on the quality of the status of environmental in order to provide methodological and scientific support to decision making in the field of environment. It performs works in the field of processing and interpretation of meteorological, hydrological and environmental information and monitoring in the field of geographic information systems.

http://www.meteo.md/index.php/calitatea-mediului/.

The Apele Moldovei Agency has maintaining the national database on hydrographic basin, water and sanitation, GIS map on Hydrographic Basins and Districts of Hydrographic Basins:

http://www.apelemoldovei.gov.md/pageview.php?l=ro&idc=134&
http://www.apelemoldovei.gov.md/pageview.php?l=ro&idc=134&id=439

The State Ecological Inspectorate: fulfills the environmental data base on woter pollution and use, air pollution, flora and fauna use, waste management, soil and mineral resources, illegal use of natural resources. The data base and annual reports and digital maps are published on the website and available for decision making and large public.

http://ies.gov.md/harta-2/

Digital Map of Soils, represents the following layers: soil texture, erosion, soil subtypes, soil types, landslides.

http://www.ipaps.md/maps/index.php?id=4

The Agricultural Information System developed by the Agricultural Information Center is set up to assist the Ministry of Agriculture and Rural Development and Environment, its subdivisions and the National Agency for Food Security in the process of identification, development and implementation of automated information systems that will allow re-engineering and digitization of public services provided in the agro-food and processing sector. The Agricultural Information System digital maps of contain information from the agricultural activities:

https://www.cia.md/ro/geoportal-agricol

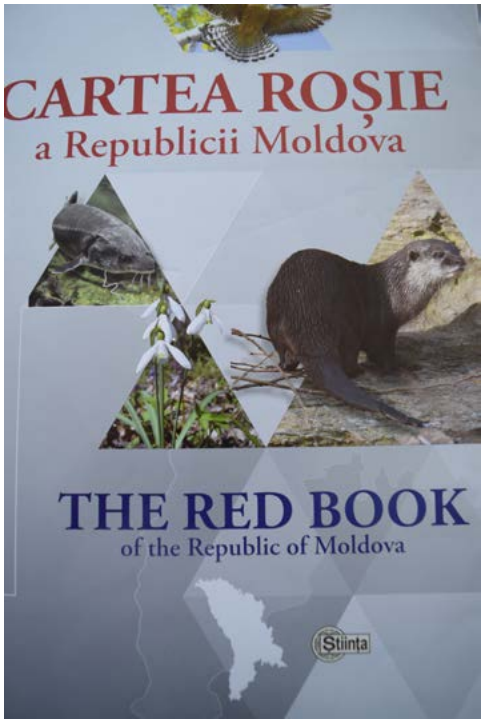
1. Agricultural enterprises;
2. Harvesting;
3. Crops distribution;
4. Harvesting of crops;
5. Livestock farms and flocks;
6. Map of Soils of the Republic of Moldova
7. Education and research institutions in the field of agriculture

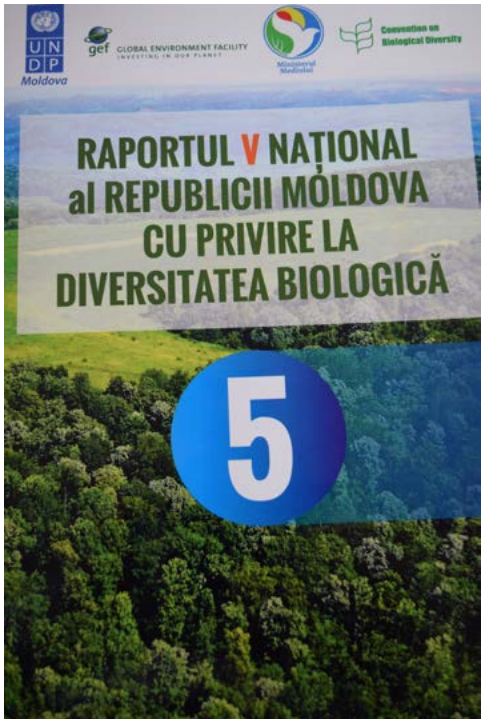
The National Statistics Bureau of Moldova is an important source of data for biodiversity assessment, maintained by the National Bureau of Statistics. The database contains annual data and information on forest fund, hunting fund, protected areas, weather, air pollution and water use.

http://statbank.statistica.md/pxweb/pxweb/ro/10%20Mediul%20inconjurator/?rxid=b2ff27d7-0b96-43c9-934b-42e1a2a9a774

Sustainable Development Goals

The activities under the ABT 19 have an important role to achievement of the global SDG goals, in particular to the SDG 4, 9, 12, 17 by ensuring learning from knowledge and skills needed to promote sustainable development, increase resource use efficiency, clean and environmentally sound technologies and industrial processes; efficient use of natural resources; implement science-based management plans, enhance regional and international cooperation on access to science, technology and innovation.





Target 20. Resource mobilization

Annually, the budget planning process takes place on the basis of the spending strategy for the environmental sector for a period of 3 years, which is part of the elaboration of the *Medium-Term Budgetary Framework* (MTEF). During the years 2014–2018, 4 spending strategies were developed.

The Strategy for Environmental Protection Program of the Spending (Funds) is structured on the sub-programs. In the period of 2014 and 2018 the Subprogram 5 "Biodiversity Conservation and Conservation" was included in the Strategy for Environmental Protection Program of the Expenditure (Funds), which includes activities to extend the areas covered by forests, areas of protected natural areas and conservation and protection of flora and fauna Moldova. The aim of the sub-programme is to ensure the preservation of biodiversity, the protection and rational use of natural resources, the extension of protected areas and the protection of natural areas. Activities within the subprogram have been carried out by the Biodiversity Office of the Ministry of Environment, Moldsilva Agency by implementing t projects.

The *Subprogram "Protection and Conservation of Biodiversity"* is funded entirely from the financial sources of the *National Ecological Fund*, which is a budget line of expenditures for the implementation of environmental projects. Thus, from the sources of the *National Ecological Fund* are funded projects related to the protection and preservation of biodiversity, the extension of the forests covered, especially planting on degraded lands, the extension of the wooded areas, the creation of parks, squares, etc.

At the same time, between 2014 and 2018, biodiversity protection and conservation activities were supported by the following development partners: *GEF / UNDP*, *UNEP*, *Council of Europe / European Union*, *Austrian Development Agency*, *World Bank*. The budget of the projects implemented with the support of the external assistance was about 3,000,000 Euros and was focused on the activities related to the

Nistru River. Landscape Reserve Dubăsarii Vechi.

creation of the Emerald Network at national level, the consolidation of the forest management, the sustainable management of forests, the rehabilitation of the forest curtains, the integration of the biodiversity conservation aspects in sectoral policies, strengthening capacity to promote the implementation of the *Cartagena Protocol*.

With the support of the project "Strengthening the Protected Natural Area Network for the Protection of Biodiversity and Sustainable Development in the Danube Delta and the Lower Prut Region – PAN Nature", it was possible to promote and create the legal framework (Law No. 132 of 13.07.2018) through which it was founded Biosphere reserve "Prutul de Jos" with an area of 14771.04 ha. Following the fulfillment of the commitments undertaken by the Republic of Moldova and the admission of the Prut de Jos Biosphere Reserve under the patronage of UNESCO, it was possible to start the activity of creation of the cross-border tripartite biosphere reserve consisting of the Danube Delta Biosphere Reserve (Romania), the Danube Biosphere Reserve and Biosphere Reserve "Prutul de Jos" (Republic of Moldova).

Taking into account the provisions of the *Strategy for Biodiversity Conservation for 2015–2020*, approved by GD no. 274 of May 18, 2015, the costs related to the implementation of the identified actions for the period 2014–2018 were 20,703.41 thousand lei

http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=358781

Thus, out of the total of 20,703.41 lei estimated for the period 2014–2018, the amount of MDL 12,233.8 thousand was allocated from the state budget (*National Ecological Fund*) and from external sources 60,000.0 thousand lei for the financing of the activities related to the protection and biodiversity conservation. In total, from the state budget and external sources, about 72,233.8 thousand lei were allocated for the period 2014–2018.

To meet the global energy, environmental and sustainable development challenges, the Government of the Republic of Moldova committed itself to implementing the environmental tax reform, reforming with the support of the *GEF/UNDP project "Environmental Fiscal Reform", 2012–2015*, aimed at strengthening the environmental authority's capacity to improve the existing legal and regulatory framework in the field of pollution taxes, promoting green technologies and improved subsidies in energy and agriculture, which have a positive effect on agents economics and the population in general.

http://www.md.undp.org/content/moldova/en/home/operations/projects/climate_environment_energy/proiecte-finalizate/environmental-fiscal-reform-.html

The project has helped to adjust the management and operational practices of the *National Ecological Fund* to the best standards in Central and Western Europe to ensure the sustainable development and implementation of environmental protection policies.

Sustainable Development Goals

The activities under the ABT 20 have an important role to achievement of the global SDG goals, in particilar to the SDG 10 and 17. By 2030 progressively achieve and sustain inclome grow, mobilize additional financial resources from multiple sectors.

The link below can be accessed by MTBF from 2014 until 2018:

http://mf.gov.md/ro/buget/cadrul-bugetar-pe-termen-mediu

Medium-term budgetary framework (2017-2019):

http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=366969

CBTM 2018-2020:

http://mf.gov.md/sites/default/files/sites/default/files/atasamente/comunicate/cbtm_2018-2020.pdf

The links can be accessed State Budget Execution Reports for 2014-2017:

http://old.mf.gov.md/files/reports/Raport%202014%20RO.pdf
http://old.mf.gov.md/files/reports/Raportul%20anual%20privind%20executarea%20bugetului%20de%20stat%202015.pdf

Reports on State Budget Execution for 2016-2017:

http://mf.gov.md/ro/trezorerie/rapoarte-privind-executarea-bugetului/rapoarte-anuale

Table 2. Funding of biodiversity conservation and conservation activities in 2014–2018 (thousand lei)

Year	2014		2015		2016		2017		2018
	planned	disbursed	planned	disbursed	planned	disbursed	planned	disbursed	planned
State budget (including National Ecological Fund (NEF))	5.600,0	2.063,8	1.557,74	4.621,8	10.093,09	2.774,1	3.452,58	2.774,1	10.050,0
Disbursed from the NEF:	12.233,8 lei								
External sourses 2014-2018	60.000,0 lei								
TOTAL for the period 2014-2018	72.233,8 lei								

Petrophyte ecosystem in the Republic of Moldova