Annex
to the Government's Decision
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PROGRAM
on biodiversity for the years 2024-2030

The Biodiversity Programme for 2024-2030 (hereinafter the Programme) reflects the commitment of the Republic of Moldova under the Convention on Biological Diversity, to which the country has been a party since 18 January 1996 and is developed in order to implement the provisions *of the Environmental Strategy for the years 2024-2030*, approved by Government Decision no. 409/2024, as well as is included in the Government's Action Plan for 2024, approved by Government Decision no. 887/2023[1].

The Programme is a policy framework document that, through specific objectives and outlined actions, aims to reduce pressures on biodiversity, protect and restore ecosystems and stimulate profound changes to reverse the trajectory of biodiversity loss.

The programme will ensure the implementation of the provisions *of the Convention on Biological Diversity*[2], and its two Protocols – *the Cartagena Protocol on Biosafety*, ratified by Law no. 1381/2002, including *the Nagoya-Kuala Lumpur Additional Protocol on Liability and Reparation for Damages, to the Cartagena Protocol on Biosafety*, ratified by Law no. 96/2018 and *The Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Resulting from Their Use, to the Convention on Biological Diversity*, ratified by Law no. 117/2016.

The program is linked to the *Kunming-Montreal Global Biodiversity Framework (CGBKM),*[3] which was adopted in December 2022 at the 15th meeting of the Conference of the Parties to *the Convention on Biological Diversity*, to which the Republic of Moldova is a party. A *major objective* of the CGBKM is to halt and reverse biodiversity loss by 2030 and restore biodiversity levels by 2050. CGBKM represents "an ambitious path forward for our planet" and provides countries with "the tools to turn the tide" on biodiversity loss.

As a vision of the development of the field of biodiversity conservation towards 2050, CGBKM aims to guarantee a high level of protection and restoration of

[1] https://gov.md/sites/default/files/document/attachments/acte_normative_adoptate_in_sedinta_guvernului_din_22.11.2023.pdf
[2] https://www.cbd.int/
[3] https://www.cbd.int/doc/decisions/cop-15/cop-15-dec-04-en.pdf

biodiversity, the only way to preserve the quality and continuity of human life. The CGBKM foresees, in particular, "by 2030, taking urgent action to halt and reverse biodiversity loss in order to put nature on the path to recovery for the benefit of people and the planet by preserving and sustainably using biodiversity and ensuring the equitable sharing of benefits from the use of genetic resources, while providing the means for implementation", which are reflected in the **23 global targets,** for urgent action over the decade to 2030.

The program is related to the execution of the provisions of multilateral and regional (European) environmental agreements in the field of biodiversity conservation to which the Republic of Moldova is a party, thus having the obligation to implement these agreements, as follows:

- *The post-2020 biodiversity framework*, adopted at the 2021 UN Biodiversity Summit, which marks a major milestone for governments to agree on a set of goals and targets to halt and reverse the alarming global decline in biodiversity. This framework aims to set measurable targets, benchmarks until 2030, as well as targets to achieve the 2050 vision of the Convention on Biological Diversity to live in harmony with nature through the valorisation, conservation, restoration and sustainable use of biodiversity;
- *The Paris Agreement on climate change* is the first legally binding global agreement, the purpose of which is to contribute to limiting global warming below the threshold of 1.5°C and to impose the zero emissions target in the plans of all signatory states, as well as the implementation of a mechanism through which states accelerate the decarbonization process every five years. All this to combat the increasingly strong effects of climate change;
- *Convention on the Protection of the World Cultural and Natural Heritage (UNESCO, Paris, 1972),* ratified by Law no. 1113-XV of 06.06.2002, which aims to ensure the main priorities for achieving the Sustainable Development Goals and improving the human condition.
- *The Convention for the Conservation of European Wildlife and Natural Habitats (Berne Convention),* ratified by Parliament Decision no. 1546-XIII of 23.06.1993, which aims at the conservation of wild flora and fauna and their natural habitats, as well as promoting European cooperation in this field;
- *Convention on Wetlands of International Importance in Particular as Waterfowl Habitat (Ramsar Convention*), ratified by Parliament Decision no. 504-XIV of 14.07.1999, which provides the framework for the conservation and wise use of wetlands and their resources;
- *Convention on the European Landscape (Florence, 2000),* ratified by Law no. 536-XV of 12.10.2001, the purpose of which is the protection, management and planning of the landscape, with reference to the entire territory of the States Parties, promoting public awareness and participation;

- *Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES Convention),* ratified by Law No. 1246-XIV of 28.09. 2000*, the* purpose of which is to ensure that international trade in wild animals and plants does not lead to the extinction of these species in the wild;
- *The Convention on Access to Information, Public Participation in Decision-Making and Access to Justice in Environmental Matters (Aarhus Convention),* ratified by Law no. 86 of 10.05.2000, the purpose being to guarantee the rights regarding access to information, public participation in decision-making and access to justice in environmental matters;

The Convention on the Conservation of Migratory Species of Wild Animals (Bonn, 1979) and the Agreement on the Conservation of Bats in Europe (EUROBATS, 2000), the Agreement on the Conservation of African-Eurasian Migratory Waterbirds (The Hague, 1995), ratified by Law no. of 28.09.200, the aim is to effectively manage and conserve migratory species of wildlife.

In order to ensure the process of accession of the Republic of Moldova to the European Union, the Programme will support the implementation of the following policy documents:

- *The Association Agreement between the Republic of Moldova, on the one hand, and the European Union and the European Atomic Energy Community and their member states*, on the other hand, ratified by Law no. 112/[4]. The Programme corresponds to the provisions of the Agreement, in particular the areas set out in the thematic chapters 'Environment' and 'Climate Action', and provides for the alignment of objectives, priorities and commitments in the field of biological diversity at national level with those of the European Union.
- *The European Green Deal*, in support of which the EU has adopted a number of important strategies that take into account the biodiversity component: the EU *Farm to Fork Strategy*[5], the EU Strategy on Adaptation to Climate Change, the EU Forest Strategy[6] and the EU Action Plan "Zero Air, Water and Soil Pollution". the European Thematic Strategy on Soil Protection and the New EU Biodiversity Strategy for 2030. They are meant to support each other, bringing together nature, farmers, businesses and consumers.

[4] https://eur-lex.europa.eu/RO/legal-content/summary/association-agreement-with-moldova.html
[5] https://eur-lex.europa.eu/legal-content/RO/TXT/?uri=celex%3A52020DC0381
[6] chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://eur-lex.europa.eu/legal-content/RO/TXT/PDF/?uri=OJ:JOC_2023_125_R_0003&from=EN

- *The European Biodiversity Strategy for 2030*[7], being a long-term strategic document that, among other things, proposes to expand the European network of protected areas, restore ecosystems, adopt more effective governance measures and improve knowledge, increase funding and investment for natural resources and, finally, place the environment and health as a whole.

The EU Nature Restoration Plan sets out the following European targets:

- reversing the trend of pollinator decline,
- reducing the risks and use of chemical pesticides by 50% and doing the same for the use of the most dangerous pesticides,
- allocating at least 10 % of agricultural land to landscape features with a high degree of diversity,
- the use of at least 25% of agricultural land for organic farming and a significant increase in the uptake of agro-ecological practices,
- planting three billion new trees in the Union, in full respect of ecological principles,
- a 50% reduction in the number of Red List species threatened by invasive alien species,
- substantially reducing the negative effects of fishing and mining on sensitive species and habitats, including the seabed, in order to restore them to good ecological status,
- the elimination of by-catches or their reduction to a level that allows for the recovery and conservation of species.

The programme is developed in accordance with the national policy framework in the field of economic development and environmental protection, including:

- *The National Development Strategy "Moldova Europeana 2030"* (approved by Law no. 315/2022), which, through its Program of Actions and Specific Objectives stipulated in Chapter 10 "Ensuring the fundamental right to a healthy and safe environment", stipulates the following:
  - significant increase in the area of forested land and natural areas protected by the state;
  - establishing a '0' balance between degraded and restored land;
  - Ensuring resilience to climate change by reducing climate change risks and facilitating adaptation in six priority sectors: agriculture, water resources, health, forestry, energy and transport;
  - progressively improving the efficiency of resources for consumption and production and decoupling economic growth from environmental degradation.

[7] https://eur-lex.europa.eu/RO/legal-content/summary/eu-biodiversity-strategy-for-2030.html

Therefore, through the objectives of the Programme, it will be possible to track progress in achieving the following Sustainable Development Goals (SDGs) at national level:

- **SDG 1:** Eradicate poverty in all its forms and in any context *(Target 1.5 By 2030, build resilience of the poor and in vulnerable situations and reduce their exposure and vulnerability to extreme climate-related events, including drought and floods);*
- **SDG 6:** Ensure the availability and sustainable management of water and sanitation for all (*Target 6.5. By 2030, implement integrated water resources management at all levels; Target 6.6. By 2030, protect and restore water-related ecosystems, including forests, wetlands, rivers, aquifers and lakes*);
- **SDG 13.** Take urgent action to combat climate change and its impacts (*Target 13.1. Strengthening resilience and adaptive capacity to climate-related risks and natural disasters; Target 13.2. Mainstreaming climate change measures into national policies, strategies and plans; Target 13.3. Strengthening the institutional framework in the field of adaptation to climate change, ensuring awareness among all actors involved, including the population, of the risks of climate change and adaptation measures);*
- **SDG 14.** Conservation and sustainable use of oceans, seas and marine resources for sustainable development (*Target 14.1. By 2025, prevent and significantly reduce pollution of surface waters, in particular from land-based activities);*
- **SDG 15.** Protecting, restoring and promoting the sustainable use of terrestrial ecosystems, sustainable forest management, combating desertification, halting and repairing soil degradation and halting biodiversity loss:
    - *Target 15.1. By 2020, ensure the conservation, restoration and sustainable use of terrestrial and inland freshwater ecosystems and their services, in particular forests and wetlands;*
    - *Target 15.2. By 2030, promote the implementation of sustainable management of all types of forests, halt deforestation, restore degraded forests, and significantly increase afforestation and reforestation;*
    - *Target 15.3. By 2030, combating desertification, restoring degraded land through the implementation of the Land Degradation Neutrality (LDN) mechanism, to achieve a land degradation-neutral world;*
    - *Target 15.5. Take urgent and meaningful action to reduce the degradation of natural habitats, halt biodiversity loss and, by 2020, protect and prevent the extinction of threatened species;*
    - *Target 15.9. By 2020, integrate biodiversity and ecosystem values into national and local planning, development processes, strategies, poverty reduction plans and spatial planning plans.*

The provisions of the Programme are part of the specific measures and objectives reflected in the following *National Policy Documents*:

- *The Environmental Strategy for the period 2024-2030*, approved by Government Decision no. 409/2024, which includes Specific Objective no. 5 Protect, restore and promote the sustainable use of biodiversity and natural ecosystems.
- *The National Program for the Extension and Rehabilitation of Forests for the period 2023-2032 and the Action Plan for its implementation for the period 2023-2027 (PNERP),*[8] approved by Government Decision no. 55/2023. PNERP will carry out extensive activities of planting trees/seedlings and rehabilitation/promotion of forest vegetation on an area of at least 145 thousand hectares for a period of 10 years. These activities will be carried out both on new land (through afforestation) and on land with inadequate or heavily degraded forest vegetation (through reforestation).
- *The National Program for Adaptation to Climate Change until 2030 and the Action Plan for its implementation*, approved by Government Decision no. 624/2023. Climate change adaptation planning is designed on key sectors, including agriculture and forestry.
- *Program for the promotion of the green and circular economy in the Republic of Moldova for the period 2024 – 2028,* approved by Government Decision no. 495/2024, which provides for the development and implementation of a program to reward ecosystem service providers, farmers and practitioners of agroecology, permaculture, pastoral agroforestry, who improve their performance in terms of animal welfare, environment and climate (soil carbon management and storage, more efficient management of nutrients to improve water quality, reduce emissions, create and maintain green infrastructure components.
- *The National Strategy for Agricultural and Rural Development of the Republic of Moldova for the years 2023-2030* approved by Government Decision no. 56/2023, with the specific objective on *Supporting environmentally friendly production technologies, ecological products, including biodiversity*.

This Programme is the third cycle of policy planning in the field of biodiversity conservation, the first two strategies covering the periods 2004-2010 and 2015-2020 respectively.

The Action Plan for the implementation of the Biodiversity Programme for the years 2024-2030 will contribute to progressively reducing biodiversity loss, reducing threats (pressures) to biodiversity, ensuring the restoration of degraded ecosystems, increasing the areas of protected natural areas and the Emerald Network, expanding forest areas and their appropriate management, promoting nature-based solutions (NbS), contribute to meeting people's needs through sustainable use and

[8] https://www.legis.md/cautare/getResults?doc_id=135917&lang=ro

benefit-sharing, ensuring biosecurity, propose tools and solutions for implementation and integration.

Chapter I. ANALYSIS OF THE SITUATION

Biological diversity and the benefits it offers to the population is a fundamental factor in ensuring human well-being.

Several human factors have significantly altered nature across the globe, leading to the rapid decline of biodiversity and threatening more species with extinction now more than ever before in human history. The biodiversity crisis is gaining global recognition, on a par with climate change, being recognized as an all-encompassing environmental problem, with serious consequences for all humanity.

The current conditions (climate change, fragmentation and degradation of habitats, pollution of environmental/environmental components, extinction of species, etc.) and the paradigm of socio-economic development of the Republic of Moldova, require a more realistic approach to the role of biodiversity for the national economy and the promotion of processes of protection of the components of biological diversity.

This approach is also necessary due to the limited institutional capacities of the environmental sector, the insufficient implementation of the legislation in the field, the limited integration of biodiversity considerations into the policies and practices of the sectors of the national economy and the insufficient appreciation by the population of its values.

In order to guarantee the health and resilience of our society and maintain the valuable natural chapter of our country, it is imperative to strengthen and broadly involve all actors to ensure the necessary contribution to the conservation of resources and the maintenance of the services offered by natural ecosystems at the standards established at the level of international and EU acts.

The Republic of Moldova continues to face multiple problems in the field of biodiversity conservation, a process that leads to the disappearance of some species and the transition of others to critically endangered and vulnerable categories. A significant indicator in this regard is the number of rare and endangered species included in the editions of the Red Book of the Republic of Moldova: the first edition – 55 species; the second edition – 242 species, and the list of species for the third edition, includes 427 vulnerable, endangered and critically endangered species.

According to *the Partnership on Biodiversity Indicators*[9], the following biodiversity indicators for Moldova are identified:

Biodiversity indicators for Moldova

[9] https://bipdashboard.natureserve.org/SelectIndicator.html?iso=MDA&reg=Europe

- The global average score of the **Biodiversity Engagement Indicator** for Moldova was 3.29 in 2018.

• **The Habitat Biodiversity Index** for Moldova was 0.402 in 2015. Between 2005 and 2015, the index changed at an annual rate of -0.413%.

• **The index of connection to protected areas** for Moldova was 0.227 in 2019. Between 2005 and 2019, the index changed at an annual rate of 0.7111%.

• **The Index of Representativeness of the System of Protected Areas** for Moldova was 0.062 in 2016. Between 2000 and 2016, the index changed at an annual rate of 2.74%.

• **The increase in occurrence records of species accessible through the Global Biodiversity Information Facility (GBIF)** for Moldova was 16,483 in 2019. Data are only available for a few years, so an annual rate of change cannot be calculated.

• In March 2018, **the proportion of local breeds with known risk status** for Moldova was 0.

- The coverage protection with protected natural areas in Moldova is 5.5%

• **The Red List Index** of Species Survival for Moldova, weighted with the fraction of the distribution of each species that occur in the country. The index ranges from 1 if the country has contributed as little as it can to the Global Red List Index (i.e. if all species in the country are classified as being of least concern) to 0 if the country has contributed as much as possible to the Global Red List. Index (i.e., whether all species in the country are classified as Extinct or Possibly Extinct). A downward trend indicates a decrease in the probability of aggregate survival of species in the country. The index is based on all mammals, birds, amphibians, reef-building corals, and cicadas native to the country (keeping in mind that not all countries support species from all of these groups). Between 1993 and 2020, the Red List Index changed at an annual rate equivalent to 0.02%.

• Moldova's **ecological footprint** was 7,848,967.3 hectares globally in 2014. For the time series of data available up to 2014, the ecological footprint changed at an annual rate of -1.3%.

• **The ecological footprint of per capita consumption** for Moldova was 1.9274 hectares globally in 2014. For the time series of data available up to 2014, the ecological footprint of per capita consumption changed at an annual rate of -0.01%.

• **The pressure on local biocapacity** for Moldova was 1,596 in 2014. For the time series of data available up to 2014, the pressure on local biocapacity changed at an annual rate of -2.177%.

• **The increase in occurrence records of species accessible through the Global Biodiversity Information Facility (GBIF)** for Moldova was 16,483 in 2019. There are too few years of data available for this indicator to calculate an annual rate of change.

Threats to biodiversity

The five main direct drivers of biodiversity loss[10] – changes in land use, overexploitation, climate change, pollution and invasive alien species – are causing biodiversity to disappear rapidly.

Inadequate land use. In the last 20-25 years, all factors and forms of soil degradation have intensified. According to the Land Improvement Program for the purpose of ensuring sustainable management of soil resources for 2021-2025 and the Action Plan for 2021-2023, approved by Government Decision no. 864/2020[11], about 75% of all land is used for agricultural purposes, including on slopes. Numerous protective forest strips have been deforested, the strips for regulating the runoffs on the slopes are missing. The area of eroded soils is 878 thousand ha. Depending on the degree of erosion, these soils lost from 20% to 60-70% of their initial fertility. The share of land damaged or destroyed by active landslides, ravines, etc. is 178 thousand ha. The annual direct and indirect damages as a result of erosion processes are estimated at 2 billion 723 million lei.

The valorization of the neighboring lands for agricultural purposes has as a serious consequence the erosion of the fertile soil, the acceleration of secondary pollution processes (fertilizers, pesticides) and the silting of the aquatic objectives in the vicinity.

The continuous extraction of stone, sand and pebbles from the Dniester river bed and the Prut river leads to the destruction of the breeding sites of lithophilic fish species.

Climate change. The biodiversity crisis and the climate crisis are intrinsically linked. Climate change accelerates the destruction of the natural environment through droughts, floods and forest fires, while the destruction of nature and its poor exploitation are drivers of climate change.

According to the climate vulnerability assessment methodology (National Program for Adaptation to Climate Change until 2030 and the Action Plan for its implementation, approved by Government Decision no. 624/2023[12]), the Republic of Moldova ranks as the most vulnerable country in Europe. The impact of climate change on social, economic and environmental dimensions is forecast to intensify in the medium and long term. In the absence of interventions, climate change is forecast to reduce surface water flows by 16–20% by 2030, a 13% decrease in total annual rainfall, droughts will become longer and more severe, while medium-term projections indicate a continuous increase in the average annual temperature between 2010 and 2040 by 2°C. It is imperative to implement sustainable agricultural and

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[10] IPBES (2019), Summary for policymakers, [IPBES (2019), Rezumat pentru factorii de decizie], p. 1719, B.10. Agenția Europeană de Mediu (2019), The European environment - state and perspective 2020 (Mediul european - situația actuală și perspective în 2020)

[11] https://www.legis.md//cautare/getResults?doc_id=125027&lang=ro

[12] https://www.legis.md/cautare/getResults?doc_id=140163&lang=ro

forestry practices aimed at promoting biodiversity growth and combating climate change.

As regards the risks of climate-related natural disasters, according to the above-mentioned Program, the Republic of Moldova is prone, in particular, to floods and droughts. The 2020 drought caused a reduction of more than 26% in agricultural production and had a significant socio-economic impact, with almost 20% of job losses in the agricultural sector, thus affecting the daily existence of the vulnerable rural population.

Regarding rainfall, the 4th National Communication of the Republic of Moldova[13] forecasts a 13% decrease in the total annual amount, while the annual flows will become more unstable with the increase in the frequency of floods. Climate models in different greenhouse gas (GHG) mitigation scenarios demonstrate a reduction in the availability of water resources. At the same time, medium-term projections point to a continuous increase in the average annual temperature between 2010 and 2040 by 2°C. Agriculture, water resources and forestry, as well as human health, are among the sectors most at risk from the impacts of climate change.

Environmental pollution with various wastes endangers the functionality of natural ecosystems.

Also, soil, water and atmospheric air pollution is a persistent problem in the country despite all the efforts made to solve them. The quality of the soil is influenced, in particular, by the inadequate sanitation of the territories. Apart from the waste deposited in authorized and spontaneous places (ramps, platforms and polygons), significant quantities of waste, mostly solid, are transported (thrown) into ravines, forest strips, canals and streams, damaged lands, etc.

A serious problem is the deliberate burning of solid household waste, leaves and garden waste both in localities and at their garbage dumps, which leads to atmospheric air pollution with particularly toxic substances. The pollution of aquatic and marsh ecosystems with pesticides washed from adjacent agricultural ecosystems, with industrial waste, with manure from animal and processing complexes, with communal wastewater has caused not only the destruction of some species of microorganisms, lower and higher plants, invertebrate and vertebrate animals, but also the intensification of the processes of eutrophication of water, disruption of its functionality and ecological balance.

A problem for the Ramsar Wetland "Lower Prut Lakes", which also includes the "Lower Prut" Scientific Reserve, is the extraction of oil from one of the wells that is located near the strictly protected area of the reserve. The oil is extracted on a platform with an area of 40 m2 surrounded by water all around[14].

[13] http://www.clima.md/doc.php?l=ro&idc=81&id=4256

[14] https://www.environment.md/public/files/caed8202fb5b8d7440325d5429606211.pdf

The main sources of penetration of ecotoxicants in the fl. Dniester and r. Prut are domestic and street activities (liquid and solid communal residues), the agro-zootechnical sector (herbicides, insecticides, fungicides, mineral fertilizers, etc.), the production industry (plastics, synthetic dyes, etc.), pollution with special residues from the pharmaceutical sphere (antibiotics, hormonal preparations, contraceptives, endocrine disruptors, etc.).

Invasive alien species. With reference to invasive alien species, we mention that in the last decade there has been a clear increase of the anthropophilic element in the flora of the Republic of Moldova, which has caused essential changes in the structure of the plant cover. The invasion of synanthropic species in degraded natural ecosystems slows down the restoration processes of natural biocenoses and affects their functionality. Scientific sources indicate 126 alien plants and about 149 species of animals with an invasive or potentially invasive nature, species that have shown a harmful effect on biodiversity and ecosystem services and that have an impact on human health. In the Republic of Moldova and in the neighboring countries, several species of alien plants with increased invasive potential are identified, which significantly affect the native ecosystems, among them: *Acer negundo L., Ambrosia artemisiifolia L., Amorpha fruticosa L., etc*. Currently, the imminent danger of these species is found in the Republic of Moldova. It should be noted that the existing institutional framework does not meet the needs of control and prevention of threats related to invasive species: there is a lack of a national policy on invasive alien species, the possible risk to natural ecosystems, habitats and native species in the process of their introduction is not assessed.

Overexploitation of biological resources. The existence of illicit activities and corrupt schemes of poaching and illegal logging endanger not only the existence of species, but also the state of ecosystems, which causes the discrediting of activities in some areas of the national economy. Also, in most cases, the legislation on land delimitation, constructions in green spaces, forest guarding, collection of objects of the plant kingdom and acquisition of objects of the animal kingdom are violated.

The existing normative and institutional framework is insufficient. The existing regulatory framework tangential to the field of biodiversity is to be completed and harmonized with the provisions of the EU Directives and Regulations according to the National Action Plan for the accession of the Republic of Moldova (approved by Government Decision no. 829/2023), the Association Agreement between the Republic of Moldova, on the one hand, and the European Union and the European Atomic Energy Community and their member states, on the other hand, signed on 27 June 2014 in Brussels, Belgium and ratified by the Parliament of the Republic of

Moldova on 2 July 2014, and by the European Parliament on 13 November 2014[15], (Chapter 16 "Environment").

Also, in the Government's Action Plan for 2024, approved by Government Decision no. 887/2023 and in the National Action Plan on the implementation of the criteria for the accession of the Republic of Moldova to the European Union and on the implementation of the Moldova-EU Association Agreement for 2023 – 2027, approved by Government Decision no. 829/2023, the Ministry of Environment also included the activities regarding the development and approval of a number of new laws, including the law on grasslands, the law on invasive species, the law on protection strips, the new law on natural areas protected by the state, etc.

Another problem is ensuring ***the implementation of biodiversity legislation at local level***. Public authorities are delegated certain responsibilities for the management of natural resources, but they do not have sufficient financial capacities and qualified human resources.

Among *the main causes* of the precarious state of biodiversity are: insufficient administrative capacities in the field of environmental protection, lack of knowledge and practices necessary for the implementation of legislation at national and local level, in particular insufficient capacities at the level of authorities responsible for environmental regulation and enforcement, lack of investment and delay investments in the infrastructure necessary to reduce pollution, to which is added the insufficiency of environmental data and information, of automated (digitized) environmental information systems, and last but not least, the system of sanctions applied at the moment does not reflect a balance between the seriousness of the harmful act and its consequences and does not represent a deterrent factor for those who violate the law.

Section 1. institutional framework and for the application of effective management for the forest fund, protected natural areas, wetlands and national ecological networks

The main institutional actors with competences in the field of conservation, protection and management of biodiversity are the following:

Ministry of Environment - it is the central specialized body of the public administration that ensures the implementation of government policy in the areas of activity entrusted to it, such as environmental protection, climate change and sustainable management of natural resources. According to the organizational chart of the Ministry of Environment, approved by GD no. 145/2021, the Department of Policies in the field of nature conservation and biosecurity operates within the

[15] https://dcfta.md/uploads/0/images/large/http-eur-lex-europa.pdf

ministry, which has the basic mission of developing and promoting the state policy in the field of rational use of natural resources, biodiversity conservation, natural areas protected by the state, forest fund, hunting fund and biological security, within the limits of the competence and conditions provided by the environmental legislation in the field of natural resources. Force;

Environment Agency- is an administrative authority subordinated to the Ministry of Environment, which carries out activity in the following fields of activity, stipulated according to Art. 8 of the Government Decision no. 549/2018 on the establishment, organization and functioning of the Environment Agency: i) regulation and authorization of activities with an impact on the quality of the environment, issuing to individuals and legal entities permissive acts for the practice of entrepreneurial activities with an impact on the environment (authorizations, environmental agreements, permits, certificates, notifications, approvals and coordinations), provided for in the Nomenclature of permissive acts, approved by Law no. 160 of 22 July 2011 on the regulation by authorization of entrepreneurial activity; ii) monitoring the quality of environmental factors (monitoring of the quality of water, air, soil, forest and natural areas protected by the state, monitoring of the state and use of water and soil resources, monitoring of the plant kingdom and animal kingdom, monitoring of fisheries, monitoring of the state of the subsoil, monitoring of air pollution, geological monitoring, monitoring of environmental pollution) in order to provide natural and legal persons with information on environmental quality, development of the system of statistical indicators in the field of environmental protection, as well as for the purpose of elaboration and publication of the National Report on the state of the environment in the Republic of Moldova; iii) creating and administering cadastres and special registers, administering the information and data system for its fields of activity and ensuring public access to environmental information.

Environmental Protection Inspectorate - is an administrative authority subordinated to the Ministry of Environment, whose legal status, mission, fields of activity, basic functions, main attributions and rights, as well as the organization of the activity are regulated by the Government Decision no. 548 of 13.06.2018 on the organization and of the Environmental Protection Inspectorate. The mission of the Inspectorate is to implement the state policy in the field of environmental protection and rational use of natural resources, to exercise state control and supervision, to prevent and counteract violations in the field of environmental policy; protection of atmospheric air; aquatic resources; flora, fauna and protected natural areas; soil and subsoil protection; waste and chemical management; rational use of natural resources; planned activities, in order to ensure a high level of supervision and protection of the environment, public interests, the ecological safety of the state and other values protected by legislation.

Agency "Moldsilva" - is the administrative authority subordinated to the Ministry of Environment, empowered to ensure the implementation of the state policy

in the fields of forestry and hunting, the activity of the authority being regulated by the provisions of the Government Decision no. 150 of 02.03.2010 for the approval of the Regulation on the organization and functioning of the "Moldsilva" Agency, the structure and the limit staff of its central apparatus. The Agency's mission is to implement the policy promoted by the central environmental body of the public administration in the fields of forestry and hunting, in order to ensure the sustainable development of the forest and hunting sector in the forest fund, ensuring the protection and protection of forests and fauna, maintenance and conservation of the biodiversity of the Republic of Moldova. In order to achieve its mission, in accordance with the provisions of item 8 of the Operating Regulation, the Agency participates in the process of elaboration, analysis, monitoring and evaluation of sectoral policy documents, as well as contributes to the estimation of the social, economic-financial and other impact of policy documents; organizes and coordinates the implementation of policies in the areas of competence, ensuring the uniform application of national legislation in the areas concerned; develops and implements programs for the development of production factors, as well as for the diversification of marketing strategies in order to expand the markets for forest and hunting products and services. It should also be noted that the "Moldsilva" Agency manages most of the natural areas protected by the state (about 50% of the total area), the others being managed by local public authorities. The regime of protected areas is ensured by the territorial entities subordinated to the "Moldsilva" Agency.

I.P. "National Office for the Implementation of Environmental Projects" - in accordance with GD no. 145 of 25.08.2021, the Ministry of Environment is the founder of the IP "National Office for the Implementation of Environmental Projects, a public institution that operates in accordance with the provisions of the Government Decision on the organization and functioning of the Public Institution National Office for the Implementation of Environmental Projects no. 1249 of 19.12.2018 and is responsible for the administration of the National Environmental Fund. The National Environmental Fund, managed by the Office, is currently the only governmental financial instrument intended to support and implement projects and programs for environmental protection, in order to achieve the objectives agreed with the European community in the field of environmental protection, climate change and reasonable management of natural resources. At the same time, it is a lever for directing the actions of the public and private sector in the environmental protection segment in the right directions, in order to achieve the expected results in the above-mentioned field.

The current management system of natural resources and biodiversity both at central and local level is insufficient in terms of managerial, monitoring, financing and resource mobilization capacities. Asftel, certain deficiencies are attested in the management of the objects of the natural areas protected by the state, in ensuring and developing the sustainable management of forests, green spaces, pastures, hunting grounds, fishing water basins, etc. The situation worsens due to the non-compliance

with the protection regime, as well as due to the insufficient implementation of the legislation on the elaboration of management plans and cadastres of natural areas protected by the state as well as those of the plant kingdom and animal kingdom. In the process of creating the national ecological network, there is also a slow growth. The main reason is the lack of administrations and sources of financing, especially the natural areas protected by the state, which are administered by local public authorities.

At the level of the institutional framework, it is necessary to create a ***central authority in the field of management of all categories of protected natural areas*** (Protected Areas Agency), which will ensure the unitary and efficient administration of protected natural areas and the conservation of natural habitats, wild flora and fauna and will allow ensuring a sustainable management process of protected natural areas. At the same time, the creation of the mentioned Agency will boost the process of developing integrated management plans for natural areas and sites of the Emerald network, through closer cooperation of the central environmental authorities with the academic sector, academia, local public authorities and civil society.

Most protected areas in the Republic of Moldova perform multiple functions, which are reflected in the management objectives for each category of protected area. In order to achieve these objectives and fulfil these functions, well-coordinated actions are needed, based on a good knowledge of the situation as well as adequate resources. The priority objectives of any PA must be achieved by harmonizing human activities so that it is possible to maintain and improve biodiversity values, while local communities and other stakeholders initiate/implement activities especially with the aim of increasing their level of well-being. A management plan for the protected area has the role not only of a guiding document for the administrator of the protected area in order to effectively manage the site, but also provides measures for the harmonization of all activities within the area.

The program proposes the elaboration ***of Management Plans for protected areas*** with legal personality (Scientific Reserves, Lower Prut Biosphere Reserve, Lower Dniester National Park).

At present, ***three Ramsar areas of international importance*** are included in the Law on the Fund of State Natural Areas, including the Lower Prut, Lower Dniester and Hungarian-Holosnita Lakes, which have an area of 94,705.5 ha (947.06 km2).

Another activity that contributes to strengthening the institutional framework is the development ***of management plans for Emerald sites***. The main objectives of the site management plans are the protection of the species and natural habitats listed in Resolutions no. 4 (1996) and no. 6 (1998) of the Convention on the Conservation of European Wildlife and Natural Habitats (Berne, 1979), (hereinafter the Berne Convention), which are present in every site. This is achieved by implementing appropriate conservation measures to protect them from external threats and ensure a satisfactory level of conservation. The management plans for the Emerald sites will be developed for a period of 10 years, with a 5-year action plan that will be reviewed and reformulated every five years in terms of changes in habitat extent and distribution,

changes in the emergence of keystone species, conservation achievements and an accounting of objectives still met/not met.

Another institutional component that requires action is ***ensuring sustainable management of High Conservation Value Forests (HLPs)*** The findings of recent studies show that, according to the approach developed by the FSC, Moldova has significant forest areas that have the potential to be HLCs. Taking into account overlaps, they are estimated at about 175,000 ha (or 47.3% of the area of existing forests). The classification of the CRVP, as well as the measures that would ensure a sustainable management of CRVP, are reflected in **Table 1.**

Table 1. PVRC classification and management measures

PVRC Category	**Subcategories of PVRC**	**Proposed management measures**
PVRC 1. Forests containing globally, regionally or nationally significant concentrations of biodiversity (rare, threatened or endangered species	PVRC 1.1. Forest areas in protected areas	The management measures for these forests should be those established by the management plans of the NPA
	PVRC 1.2. Forests that are home to rare, threatened or endangered species	
	PVRC 1.3. Forests with critical seasonal use	
PVRC 2. Extensive forest landscapes, globally, regionally or nationally significant, in which there are viable populations of native species, in their natural form in terms of distribution and density		
PVRC 3. Forests comprising rare, threatened or endangered ecosystems		
PVRC 4. Forests providing essential environmental services in critical situations	PVRC 4.1. Forests of particular importance for water sources	
	PVRC 4.2. Critical forests for preventing and combating erosion	
	PVRC 4.3. Forests with a critical impact on agricultural land and air quality	
PVRC 5. Forest sectors essential for meeting the basic needs of local communities or indigenous peoples (for subsistence, health, nutrition, water, etc.)		
PVRC 6. Sites, resources, habitats and landscapes of global or national cultural, archaeological or historical significance and/or of cultural, ecological, economic or religious/sacred importance to the traditional cultures of local communities		

Source: Report on the identification of forests with high conservation value in the Republic of Moldova[16]

Section 2. Natural ecosystems

The Republic of Moldova is located in southeastern Europe, between Romania and Ukraine, with access to the Black Sea through a 200 m stretch located at the confluence of the Prut River with the Danube River in the extreme south of the country. 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 part of the country and is a hilly plain with alternating plains and plateaus. The steppe zone is located in the south and southeast 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) **forest ecosystems** (11.7% of the country's territory according to FAO), (ii) **steppe ecosystems** (1.9% of the country's surface, located in 2 zones in the North and South), (iii) **aquatic and meadow ecosystems**, (marshes) (2.85% of the country's surface), (iv) **petrophytic ecosystems** (0.68% of the country's territory). Agricultural and urban ecosystems cover almost 85% of the territory, while natural and semi-natural ecosystems cover a modest 15% of which large areas are subject to degradation.

Most of the territory is a moderate hill plateau, intersected by many springs and rivers, it is part of the Moldavian Plateau, with an average altitude of 200 m and a maximum of 250 m, divided into the Baltic steppe and the middle valley of the Prut. The black soils, rich in humus, and the temperate climate have contributed greatly to the development of the agricultural sector throughout the earth's history.

The territory was heavily deforested for agriculture in the 19th and 20th centuries, and today the Republic of Moldova has one of the smallest forested areas among European countries, of 11.4% (0.38 million hectares). The territory of the Republic of Moldova has a diverse landscape, created by the variety of natural factors (geological, orographic, climatic, edaphic, hydrographic, etc.).

Depending on the action of climatic factors, landscapes, specialization of agricultural production and administrative delimitation of the territory of the Republic of Moldova, three agroclimatic zones are defined: North, Center and South. The Republic of Moldova is located in an area with a temperate continental climate favorable to the agricultural sector, with annual summary solar radiation of about 110 kcal/cm2 and a sum of active temperatures, above 10°C for the Central and Southern area. The negative climatic peculiarities are dry periods, mainly in summer, with a lack of rain for a long time, excessive temperatures, low humidity and warm winds.

[16] Report-Identification-of-High-Conservation-Value-Forests-in-the-Republic-of-Moldova-ROM.pdf eu4environment.org

The most important natural resources in Moldova are: soils, water resources, forests and mineral ores. Soils are also the country's main natural wealth, contributing to high agricultural productivity. The soil cover includes three zonal types: brown soils, gray soils widespread in hilly regions and chernozems formed in steppe conditions on lands with lower altitudes. The main type of soil is chernozem, which occupies 70% of the land area and is relatively suitable for irrigation. The total area of agricultural land on January 1, 2019 is 3,384.7 thousand ha, of which agricultural land – 2496.4 thousand ha, with arable land – 1838.5 thousand ha, in the multiannual plantation sector with 286.6 thousand ha of which: orchards. – 131.2 thousand ha, vineyards – 133.1. For pastoral use, there are 339.1 thousand ha for meadows – 2 thousand ha, for canvas land – 30.2 thousand ha.

Moldova is one of the smallest countries in the Danube basin. The total area of natural areas protected by the state (km2) is 5.8% of the total territory of the country. Most of the natural vegetation is made up of forest ecosystems. Meadow ecosystems, with a rich genetic and species diversity, continue to be used for grazing animals and occupy about 10% of the country. Moldova is rich in species, and agro-forest biodiversity is dominant.

Moldova has a temperate continental climate, and the country's topography is dominated by a moderately hilly plateau with forest-steppe ecosystems located in the northern and central areas of the country and arid steppe in the south and southeast. The country spans three main European eco-regions: the Central European Mixed Forests, the Pontic Steppe, and the Eastern European Forest-Steppe. Many species of plants and animals typical for each of these regions are at the limit of their natural range in Moldova. It is estimated that 15% of the country remains under some form of natural vegetation cover, much of which is in a degraded state.

In terms of origin and how they are managed, Moldovan ecosystems are grouped into natural (forests, steppe, grasslands, water and swamp), agricultural and urban. The Republic of Moldova is characterized by a high degree of occupation of natural ecosystems (about 2/3 of the land is used for agricultural needs). The surface of the natural steppe and meadow ecosystems is reduced and heavily damaged. Forests alone provide sustainable habitats for most biodiversity objects.

Forest ecosystems occupy 365 thousand ha (11.4% of the country's territory), being dominated by deciduous species (97.8%), while softwood crops are minor (2.2%). The main builders of the forests in the northern part of Moldova are the pedunculated oak (*Quercus robur*) and the cherry tree (*Cerasus avium*). In the forests of the central area of Moldavia, the basic builders are the beech (*Fagus sylvatica*), the holm oak (*Quercus petraea*) and the pedunculated oak (*Quercus robur*). In the southern part of the country there are forest communities consisting of downy oak (*Quercus pubescens*) and pedunculated oak. In the floodplains of the hydrographic basins of the Dniester River and the Prut River and in the upper course of some small rivers, there are sectors with forest communities of meadow (pond), white poplar (*Populus alba*) and willow (*Salix alba*). About 1,140 species of vascular plants (which

constitutes more than 50% of the total plant species in Moldova) are present on lands covered with forest vegetation. The forests are populated by 172 species of terrestrial vertebrates (47.8% of their total number) and numerous invertebrates (whose diversity is still poorly researched).

Forest biodiversity. Up to 28 types of forest ecosystems (or forest formations) have been identified in Moldova's forests, some of which are the most biologically and economically important for the country, such as oak formations, downy oak (pubescent), beech, flooded forest, black grasshopper and many varieties of all these and other species. The "cherry forest oak" type is widespread in the north of the country and covers an area of 11 600 ha. It is characterized by monodominant stands of pedunculated oak (*Quercus robur*) with a high presence of wild cherry (*Prunus avium*). Its floristic composition includes about 350 species of vascular plants, with 10 rare species. The forest type "oak and beech pedunculated oak" in central Moldova covers about 160,000 ha. The floristic diversity of these ecosystems is the richest in the country and includes over a thousand species of vascular plants. A total of 17 species of plants are included in the Red Book of Moldova, such as: glandular marsh (*Dentaria glandulosa*), flying's feather (*Lunaria annua*), dwarf vornicerium (*Euonymus nana*), elegant macaw (*Coronilla elegans*), forest peony (*Paeonia peregrina*), bird cherry (*Padus avium*), domestic squirrel (*Sorbus domestica*), Eurasian weed stabbing (*Cephalanthera longifolia*), Lady's slipper, (*Cypripedium calceolus*) etc. The greatest diversity of vascular plants is found in the Codrii (with 945 species) and "Plaiul Fagului" (with 720 species) nature reserves. Downy oak (*Quercus pubescens*) ecosystems are present in the south of the country and cover about 7000 ha. Their floristic diversity includes about 400 species of vascular plants, some of which are included in the Red Book of Moldova, such as: the angelescu corner (*Centaurea angelescu*), the pulsatilla grandis (*Pulsatilla grandis*), the wild pear (*Pyrus elaeagnifolia*) and others.

The azonal forest ecosystems of willow, poplar and oak, which are of the flooded forest type, in the lower Prut basin cover an area of 15 000 ha. Their floristic diversity includes about 400 species of vascular plants, including rare species in Moldova, such as: black alder (*Alnus glutinosa*), white alder (*Alnus incana*), wild Eurasian vine (*Vitis sylvestris*), variegated tulip (*Fritillaria meleagris*), snake's tongue (*Ophioglossum vulgatum*) etc. About 1140 species of vascular plants are registered in the forest and forest-steppe areas of the country, which represents over 60% of all plant species in Moldova.

Forest ecosystems in Moldova are inhabited by 172 *species of* terrestrial vertebrate animals (47.8% of the total species in Moldova), of which 47 species are mammals, birds - 106, reptiles - 9 and amphibians - 10 species. The diversity of invertebrates is even greater, including over 9,000 species with a number of species listed in the Red Book of Moldova.

The regeneration of forests in the state forest fund is carried out by the Moldsilva State Agency and the State Forestry Enterprises. According to the statistics

reflected in **Table no. 2** for 2023, the cultivation works in 2022 were applied to a total of 7386 ha.

Table 2. Carrying out forest cultivation works, in ha

Types of regeneration	2020	2021	2022
Forest regeneration in the state forest fund	4371	3354	3693
.. Planting and sowing	1076	875	1255
.. Helping natural forest regeneration	2899	2184	2125
.. Natural regeneration	396	295	313

Source: National Bureau of Statistics

The steppe ecosystems have been considerably reduced as a result of the expansion of agriculture, currently occupying about 65 thousand ha (1.92% of the country's territory). The conserved sectors can be grouped into meadow-steppes, steppes and steppes under the deserts: a) The meadow-steppes are located in the lower part of the slopes with variable exposure to the Balti and Bugeag steppes, characterized by a higher productivity compared to other types of steppe ecosystems. The main edifying plants are fescue (*Festuca valesiaca*), bridal veil (*Stipa capillata*), narrow-leaved meadow grass (*Poa angustifolia*) and smooth bromine grass (*Bromopsis inermis*) b) The edifying plants and the dominants of the steppe plant cover are made of canvas. poaceae, such as fescue (*Festuca valesiaca*), feathered grass (Stipa lessingiana), bridal veil (*Stipa capillata*). A special role in the steppe flora is played by shrubs: besser (Caragana mollis, Caragana frutex), almond (*Amygdalus nana*), scalloped spirea (*Spirea crenata*); semi-shrubs: thyme (*Thymus marschallianus*), wall-mounted germander (*Teucrium chamaedrys, T. polium*). Very rarely, you can see the European Eurasian Vulture (*Spermophilus citellus*) and the Steppe Vulture (*Mustela eversmanni*) – species included in the Red Book. c) The steppes under the desert cover small areas in the south of Moldova, on the south-western slopes, on the superficial sandy-clay soils. The edifying plants are: King Ranch bluestem (*Bothriochloa ischaemum*), mugwort (Artemisia austriaca), wall-mounted *teucrium (Teucrium chamaedrys*, *Teucrium polium*).

Aquatic and marsh ecosystems. The water resources of the Republic of Moldova are composed of 3,621 rivers and small rivers with a length of over 16 thousand kilometers, 4,126 natural lakes and artificial basins with a total area of 40.9 t. Marsh ecosystems (meadows, or wetlands) are found only in the floodplains of the Dniester and Prut rivers, where fragments of grassy vegetation have been preserved, occupying 101.4 thousand ha (about 3% of the country's territory). The biodiversity of these ecosystems is quite vast, both at a specific and cenotic level. About 724 species of plants make up the meadow meadows, of which ruderal plants – 131 species, cultivated and adventitious – 8 species each. About 189 species of plants are

considered rare and endangered. In the marsh ecosystems, a numerical increase of ruderal asteraceans has been detected, which contributes to the decrease of the specific diversity and forage value of the grasslands. Of the 146 genera present in these ecosystems, the greatest specific diversity is characteristic of the genera *Poa*, *Alopecurus, Glyceria, Carex, Medicago* and *Trifolium*. In the biotopes of marsh ecosystems, 88 species of terrestrial vertebrate animals have been identified (23.2% of the total number of terrestrial vertebrate animals in the country).

The most representative natural wetlands in the Republic of Moldova with the status of wetland of international importance are the "Lower Prut Lakes", "Lower Dniester" and the "Unguri-Holosnita" area with a total area of 94.7 thousand ha. According to GD No. 665 of 14.06.2007.

Wetlands. The total area of wetlands, lakes and riparian areas in Moldova is estimated at about 94,000 ha, decreasing dramatically in recent decades due to previous river engineering that affected the water table and discharge, land use change and extensive water drainage to make the road to agricultural land. The total area of protected wetlands is approximately 94,706 ha, including only three Ramsar sites in Moldova: the Lower Prut Lakes located in the Lower Prut River Basin; The Lower Dniester and Hunguri-Holosnita in the Dniester Basin. These wetlands are home to some of Europe's oldest forests and floodplains, reedbeds, lakes, and swamps, providing essential wintering and feeding habitats for hundreds of thousands of waterfowl that migrate along various Eurasian-African airways. KBA's global database lists three main ZCBs located in the Prut River basin on the territory of the Republic of Moldova: Stanca Costești Lake (2691 ha) part of the hydropower plant and dam, jointly managed by Moldova and Romania; The Princely Forest covers 6412 ha overlapping with the existing nature reserve and the Lower Prut Manta-Beleu Lakes (8353 ha) included in the existing Lower Prut Biosphere Reserve.

Wetlands of International Importance are territories and/or bodies of water that include different types of wetland ecosystems and meet the Ramsar Convention's Criteria for Highlighting Wetlands of International Importance, having a rich biological diversity and having an important role for waterfowl. Thus, at the moment, the natural areas protected by the state constitute 4.65% of the country's territory, or 157227.4 ha, of which 94 705 ha are occupied by the 3 wetlands: Ramsar Area No. 1029 "Lower Prut Lakes" with an area of 19152 ha (the first Ramsar wetland designated in Moldova on 20.06.2000), Ramsar Area No. 1316 with an area of 60000 ha recognized on 20.08.2003 and Ramsar Area No. 1500 "Unguri-Holosnita", with an area of 15553 ha officially recognized on 14.09.2005.

Problems in the field of natural ecosystems

The biodiversity *of forest ecosystems* is increasingly threatened globally as a result of **deforestation, fragmentation, climate change** and other stressors. The biodiversity of Moldova's natural forests is under huge pressure due to various human activities. Inadequate forest management in the last century has led to a decrease in

forest genetic resources for Moldovan forests. The decline of the three native oak formations (*Quercus robur, Q. petraea, Q. pubescens*) in Moldova is strongly accompanied by the introduction of other non-native species. Both **human activity** (plant harvesting, mushroom collection, forest management activities, pollution, etc.) and the decrease in available food sources (gopher, other small rodents) continue to negatively affect large species of birds of prey, such as the Great Spotted Eagle (*Aquila clanga*), Lesser Spotted Eagle (*Aquila pomarina*), Sacred Falcon (*Falco cherrug*), etc.

The expansion of the areas occupied by agriculture, pollution from agricultural sources, excessive silvo-pastoral activities lead to the degradation of the functionality of natural steppe ecosystems and their resilience to climate change.

Felling of riparian protection strips along rivers and water basins, frequent agricultural practices of non-compliant cultivation in riparian areas lead to the degradation and pollution of aquatic ecosystems, wetlands and affect their biodiversity progressively. The construction of the Novo-Dnestrovsk dam (Ukraine) dramatically affects the living conditions of aquatic species in the Dniester River basin. Frequent droughts caused by climate change cause riverbeds to dry out, leading to the decline of biodiversity in aquatic ecosystems and wetlands. Pesticide contamination, estimated to cover about 330 ha, as well as improper disposal of solid waste, continue to pollute soil and water. Chemical compounds used in agriculture (fertilisers and plant protection products) are regulated, but the rules are not always complied with by economic operators.

The lack of management plans for natural forest areas, aquatic steppes, wetlands, ecological evils affects the process of proper management and biodiversity conservation.

The protection of wetlands is an important objective for the Republic of Moldova in the context of recognizing ***the green economy*** as the economy of the future. According to *the Environmental Strategy for 2024-2030*, approved by GD no. 409/2024, the Government aims to expand the area of wetlands up to 65 km2, as a tool in ensuring the conservation, restoration and sustainable use of terrestrial and inland freshwater ecosystems and their services.

Measures for the extension and rehabilitation of forests as well as the restoration of degraded lands are planned for the period until 2032 with the support of the *National Program for the Extension and Rehabilitation of Forests,* approved by GD no. 55/2023.

The need to develop an efficient management mechanism for all types of ecosystems in the country is an urgent requirement that would ensure the application of biodiversity protection and conservation measures and reduce their loss or decline.

Needs and actions

Target 1: Ensure the institutional framework and apply effective management for the forest fund and national ecological networks

- Increasing the share of forests under sustainable management at LPAs.
- Ensuring the updating of the forest management in the National Forest Fund.
- Planting of trees/seedlings and rehabilitation/promotion of forest vegetation on an area of at least 145 thousand ha by 2032 (PNERP).
- Updating the management plans according to the forest management indicators of the National Forest Fund.
- Elaboration of forest management for communal forests (owned by LPAs).
- Improvement and/or development of the management system of protected natural areas.
- Development of management plans for the Emerald Network sites
- Ensuring sustainable management of High Conservation Value Forests (HLPs)

Target 2: Green-rebuild degraded ecosystems to ensure at least 10% of degraded land.

Ecological restoration/reconstruction of degraded and inadequate stands, including by planting forest crops

- Creation of protective forest curtains and afforestation of riparian strips, including by planting forest crops
- Wetlands restored and extended, including within the Lower Prut Biosphere Reserve and the Princely Forest Reserve (Middle Prut)

Section 3: A coherent network of protected areas

Protected areas

The system of protected areas in the Republic of Moldova covers practically all natural ecosystems, such as forest, steppe, meadow and petrophytic ecosystems. The national objective of expanding protected areas in the Republic of Moldova to 8% of the country's territory by 2030 is included in the Environmental Strategy for 2024-2030, approved by Government Decision no. 409/2024.

According to the Law on State Protected Natural Areas, the total area of the State Protected Natural Areas Fund is 210,695.87 ha (2106.96 km2) or 5.8% of the total territory of the country. The State Protected Natural Areas Fund involves a total of 307 protected areas, reflected in **Tables 3, 4, and 5**, including: Orhei National Park, Biosphere Reserve, five scientific reserves, natural monuments, nature reserves, landscape reserves, wetlands of international importance (Ramsar), landscape architecture monuments, dendrological gardens and zoos. In 2006, three Ramsar areas of international importance were included in the Law on the Fund of State Natural

Areas, including the Lower Prut Lake, the Lower Dniester Lake and the Hungarian-Holosnita Lake, covering an area of 94,705.5 ha (947.06 km2). The total number of protected natural areas in the country increased to 4.65%. In 2013, the Orhei National Park was established with an area of 33,792.09 ha (337.92 km2), which led to the expansion of the total area of protected natural areas to 189,385.9 ha, which constituted 5.61% of the country's territory. Map of Orhei National Park.

In 2018, the "Lower Prut" Biosphere Reserve was established by Law no. 132/2018 for the purpose of conserving terrestrial and/or aquatic geographical areas with physical-geographical elements and formations of national and international importance, including the indigenous species of plants and animals specific to this territory.

Table 3. Classification of protected areas in the Republic of Moldova and compliance with IUCN categories, 2022

Categories of protected areas			Compliance with IUCN categories	Properties	Area (ha)
Biosphere Reserve				1	14771,1
Scientific reservations			I	5	19378
National parks			II	2	95676,09
Monuments of nature	geological and paleontological		III	86	2862,2
	Hydrological			31	99,8
	Botanical	representative sectors with forest vegetation		13	125,2
		Secular trees		158	-
	rare floristic and faunal species			472	-
Nature reserves	Forestry		IV	51	5001
	of medicinal plants			9	2796
	Mixed			3	212
Landscape Reservations			V	41	34200
Resource Reservations			YOU	13	523
Areas with multifunctional management	representative sectors with steppe vegetation		LIVE	5	148
	Representative sectors with meadow vegetation			25	674,7
	Forest protection curtains			2	207,7
Dendrological gardens				2	104
Monuments of landscape architecture				21	304,9
Zoos				1	20
Wetlands of international importance				3	94705,5

Source: National Bureau of Statistics of the Republic of Moldova. Natural Resources and Environment in the Republic of Moldova Statistical Collection 2022 Edition.

The total area of the "Lower Prut" Biosphere Reserve is 14,771.04 ha or 147.71 km2, including 824 ha or 8.24 km2 of forest land. The management of the "Lower Prut" Biosphere Reserve is established in the Framework Regulation of Biosphere Reserves approved by Government Decision no. 782 of 3 August 2000.

In 2018, the "Lower Prut" Biosphere Reserve was established by Law no. 132/2018 for the purpose of conserving terrestrial and/or aquatic geographical areas with physical-geographical elements and formations of national and international

importance, including the indigenous species of plants and animals specific to this territory.

The total area of the "Lower Prut" Biosphere Reserve is 14,771.04 ha or 147.71 km2, including 824 ha or 8.24 km2 of forest land. The management of the "Lower Prut" Biosphere Reserve is established in the Framework Regulation of Biosphere Reserves approved by Government Decision no. 782 of 3 August 2000. The total area of natural areas protected by the state in 2018 reached 210,695.87 ha (2106.96 km2), or 5.8% of the country's total territory.

Table 4. Scientific reservations

Name	**Location (rl)**	**Area, ha**	**Year of establishment**
"The Princely Forest"	Glodeni, Falesti County	6 032	1993
"Plaiul Fagului"	Ungheni	5 642	1992
"Codru"	Straseni	5 177	1971
"Lower Prut"	Cahul	1 691	1991
"Iagorlâc"	Dubasari	836	1988

Source: National Bureau of Statistics of the Republic of Moldova. Natural Resources and Environment in the Republic of Moldova Statistical Collection 2022 Edition.

In 2006, three Ramsar areas of international importance were included in the Law on the Fund of State Natural Areas, including the Lower Prut Lake, the Lower Dniester Lake and the Hungarian-Holosnita Lake, covering an area of 94,705.5 ha (947.06 km2). The total number of protected natural areas in the country increased to 4.65%. In 2013, the Orhei National Park was established with an area of 33,792.09 ha (337.92 km2), which led to the expansion of the total area of protected natural areas to 189,385.9 ha, which constituted 5.61% of the country's territory. Map of Orhei National Park.

Table 5. Wetlands of international importance

No.	**Name**	**Surface (ha)**	**Location**	**Land owners**
1.	Lower Prut Lakes (no.1029 in the Ramsar List)	19152,5	Cahul District	Central Authority for the Environment, Forestry Agency "Moldsilva", Republican Concern for Water Management "Apele Moldovei", local public

				administration authorities, other land owners
2.	Lower Dniester (no.1316 in the Ramsar List)	60000	Causeni and Stefan Voda districts, Territorial Unit on the left bank of the Dniester	Forestry Agency "Moldsilva", Republican Concern for Water Management "Apele Moldovei", local public administration authorities, other land owners
3.	Unguri–Holoşniţa (no.1500 in the Ramsar List)	15553	Ocnita, Donduşeni and Soroca districts	The Forestry Agency "Moldsilva", the Republican Concern for Water Management "Apele Moldovei", local public administration authorities, other land owners".

Source: Annex no.13 introduced by LP354-XVI of 24.11.06, MO195-198/22.12.06 art.922; in force 22.03.07

Emerald Network

The Emerald Network is an ecological network of areas of special protection interest and was established in accordance with the provisions of Law No. 94/2007 on the ecological network. The Emerald Network is a specific instrument for the protection of Europe's natural environment and part of the Pan-European Ecological Network and Natura 2000. In this context, in 2018–2019 the database for the sites, species and habitats of the Emerald network, protected by the Convention on the Conservation of European Wildlife and Natural Habitats (Berne Convention), was developed in the Republic of Moldova. The Emerald Network in the Republic of Moldova includes 61 sites with an area of 325.2 thousand ha (8.0% of the country's territory), which are home to 154 species of plants and animals and 30 habitats protected at European level. **Figure 1.**

Figure 1. Map of the Emerald site network of Moldova with site-specific coding

Source: Republic of Moldova. Sixth National Report on Biological Diversity, 2019[17]

Protected areas

According to Article 191 "Protected Areas" of the Water Law no. 272/2011, it is mentioned that at the level of each hydrographic district, protected areas of water bodies are identified and registered. The registration of protected areas is carried out through the Register of Protected Areas, a component part of the State Water Cadastre, which includes the following types of protected areas:

(a) areas intended for the abstraction of drinking water from surface and groundwater, which have an average flow of more than 10 m³ per day or which serve more than 50 persons, as well as from bodies of water which may be used in this way in the future;

b) areas intended for the protection of aquatic species of economic importance – stagnant bodies of water or watercourses, habitats of indigenous species, which maintain biodiversity and whose existence is important for the management of water resources;

c) bodies of water intended for recreation, including those identified as bathing waters;

d) nutrient-sensitive areas, including vulnerable areas and sensitive areas, especially those in agglomerations without wastewater treatment plants, those in which insufficiently or inadequately treated wastewater discharges occur and those in which systems for the biological treatment of wastewater are not certified, identified on the basis of a methodology approved by the Government;

17 https://mediu.gov.md/sites/default/files/Documente%20atasate%20Advance%20Pagines/Raport%20VI%20cu%20privire%20la%20diversificarea%20biologica%20ROM%20Web%20final.pdf

e) areas intended for the protection of habitats or species, where the maintenance or improvement of the status of waters is an important factor for their protection, including areas important for the Emerald network and wetlands of international importance.

Protected areas for habitats and species where water is an important factor

Areas important for the protection of habitats (special areas of conservation) or species (special protection areas) where the maintenance or improvement of water status is an important factor in their protection, including Natura 2000 sites (equivalent to the Emerald network for non-EU countries), designated under Directive 92/43/EEC on habitats and Directive 79/409/EEC on birds. At national level, they are identified according to Law no. 1538/1998 on the State Protected Natural Areas Fund. Through protected natural objects and complexes, a series of activities with a positive impact on the environment are implemented: preservation of the national genofund; conservation of biological diversity and natural habitats; maintaining/restoring the ecological balance, the natural aspect of the geographical landscapes, with the promotion of sustainable environmental development.

Protected areas, through the presence of valuable biological diversity, with an important role in the conservation of habitats, species and landscapes, constitute core areas of the National Ecological Network (REN), an integral part of the pan-European ecological network. Among the core areas of international importance of the REN, in the fl. Dniester we mention: Rudi-Arionești core area; Cosăuți; Cuciurgan; Iagorlâc, etc. At the same time, along fl. On the Dniester there are a number of core areas of national importance of the REN, which come to preserve the functionality of the geo-eco-systems in the region.

In the area of fl. The natural areas are of international interest due to the richness, uniqueness of habitats and rare species, framed in:

- Emerald Sites (At 33 fords, Unguri – Holoşnita, Dniester Rocks, Varancău Canyon, Lower Climates, Curatura Glade, Rezina, etc., and in the Lower Dniester sector: Zolonceni, Dubăsarii Vechi, Telița Protected Natural Area, Hârbovăț Forest, Lower Dniester etc.); Ramsar sites ("Unguri-Holosnita" Wetland and "Lower Dniester" Wetland).
- The ecological network within the DBHN, consisting of territories, habitats, landscapes and their elements, is important in the protection and conservation of biodiversity dependent on water resources. According to the annexes of Law No. 94/2007 on the ecological network, a number of natural habitats are registered within the DBHN, with species of flora and fauna of European interest, the most representative (with an area of more than 1000 ha) being 15 sites (Codru, Unguri-Holoșnița, Codrii Orheiului, Bahmut-Hârjauca, Codrii Strășenilor, Nistrul de Jos, Dniester Rocks, Rezina, Baltu Steppe, Hârbovăț Forest, Hâncești Forest, Lower Climates, Trebujeni Protected Natural Area, Dubăsarii Vechi, Dobruța).

In the same context, in the "Reference List of Types of Habitats of European Interest for which the Emerald Sites have been declared" of Law No. 94/2007 on the ecological network, a series of water-dependent habitats can be identified within the DBHN, the largest areas being located in the Lower Dniester site.

It is also worth mentioning that on the territory of the Republic of Moldova, currently, there are 11 areas of avifauna importance, achieved by applying quantitative ornithological criteria, regarding the sizes and trends of bird populations, and the protection status at international level.

The Republic of Moldova faces several legislative and practical limitations regarding the increase of the areas of protected areas on its territory:

- ***Limited resources***: One of the biggest limitations is the limited resource for the acquisition and management of new protected areas. The development and administration of such areas requires significant financial resources for the acquisition of land, the creation of infrastructure and its long-term management.
- ***Private property***: Much of the potential land for protected areas is owned by private owners. The acquisition of such land or the implementation of restrictive measures on such land requires specific legislative and administrative approaches that take into account private property rights.
- ***Resistance to change***: Changing the status of some land to designate it as protected areas may face opposition from local communities or the business community, who may see this as a restriction on economic development.
- ***Low administrative capacity***: The Republic of Moldova may face difficulties in the efficient administration and management of protected areas due to limited administrative capacities. This may include a lack of qualified personnel and financial resources to monitor and protect these areas.
- ***Complex legislation***: Protected area legislation can be complex and sometimes contradictory. This can create confusion and uncertainty about the procedures for creating and managing these areas.
- ***Land use overlap issues***: In many cases, land that could be designated as protected areas is already being used for other purposes, such as agriculture or logging. This can create land use conflicts that need to be properly managed.

Extension of protected natural areas

Expanding the areas of natural areas protected by the state up to 8% of the country's territory and ensuring their sustainable management by 2030 is one of the major objectives of the program. This can be achieved by i) identifying and designating new areas of areas of valuable importance for biodiversity and including them in the system of state-protected natural areas; ii) the extension of the Emerald Network up to 10%; iii) ensuring the institutional framework for the transition of the Emerald Network of the Republic of Moldova to the Natura 2000 Network, according to the EU Habitats Directive and the Birds Directive; iv) the elaboration of the

Register of Emerald Network sites; v) Proposal of a new Ramsar site *(PNERP)* in the Middle Prut area - Țuțora (Princely Forest); vi) Designation of wetlands: "Antonești" wetland and "Cantemir" wetland, "Sirma" wetland, etc

To overcome these limitations, the Republic of Moldova could benefit from the development of a coherent strategy and a legislative approach that would facilitate the creation and effective management of protected areas. Also, the involvement of local communities, public education and awareness, and the mobilization of financial resources can play a crucial role in increasing the area of protected areas in the country.

Needs and actions

MD target 3. Expanding the areas of natural areas protected by the state up to 8% of the country's territory and ensuring their sustainable management:

- Strengthening institutional capacities in the management of protected natural areas within environmental authorities
- Identification and designation of new areas of valuable importance for biodiversity and their inclusion in the system of natural areas protected by the state.
- Identification and designation of new areas of special European conservation interest through the Emerald Network Extension.
- Ensuring the institutional framework for the transition of the Emerald Network of the Republic of Moldova to the Natura 2000 Network, according to the EU Habitats Directive and the Birds Directive
- Elaboration of the Emerald Network Sites Register
- Elaboration of GIS maps and Integration of Emerald Network sites in the system of state protected areas and territorial planning (Cadastre). (Attracting European sources, LIFE, etc.)
- Proposal of a new Ramsar site (PNERP) in the Middle Prut area - Țuțora (Pădurea Domnească)
- Designation of wetlands: Antonești floodplain 93.6 - ha, Cantemir floodplain - 132 ha, Sîrma floodplain - 95.96 ha.

Section 4. Diversity of species of flora and fauna and protection of endangered species included in the Red Book of the Republic of Moldova

Biodiversity in the Republic of Moldova is determined by its geographical position at the intersection of three biogeographical zones: a) Central European:

represented by the Central Plateau of Moldova (maximum height 430 m) with the largest forests in the country (Codru forests), it has determined the richness of its flora and fauna, with elements from different regions, where important communities of spontaneous plants and wild animals of the xerophytic steppe in the south of the country are preserved.

Diversity of flora and fauna species

The diversity of country flora species is relatively rich and includes 5 568 plant species (of which 2 044 species of higher plants and 3 524 species of lower plants), with a number of Tertiary and Quaternary relict species, while a few very rare species constitute the subendemic element. There are 1,842 species of vascular plants and about 4,600 species of lower plants and fungi. Depending on the floristic diversity, the following natural ecosystems are distinct: forest (about 850 species), meadow (about 650 species), steppe (about 600 species), petrophytes (about 250 species), aquatic and marsh (about 160 species).

There are more than 30 species of woody plants, which are important sources of livelihood for the rural population, about 200 species of medicinal plants, while about 700 species of plants of spontaneous flora are fodder plants, which serve as food for wild animals. Natural ecosystems provide conditions for 1 357 species of fungi, including 557 species of macromycetes populate forest ecosystems. Only 70 species of the total number of mushrooms are edible.

The diversity of wildlife species that populate the country's territory is also relatively rich. In the Republic of Moldova, vertebrate fauna includes: 70 species of mammals, 281 species of birds, 14 species of reptiles, 14 species of amphibians and 70 species of fish. The invertebrate fauna comprises about 15 000 species, including 13 000 species of insects. These include 55 Ponto-Caspian relict species (of which 10% are endemic to the Black Sea Basin) and 219 species from the 3rd edition of the Red Book of the Republic of Moldova. Many species of animals have disappeared from the Republic of Moldova in recent centuries. Although the greatest diversity of vertebrates is recorded in forests (172 species), 153 (89%) of these species are found in forests associated with grasslands. Both human activity (plant harvesting, mushroom collection, forest management activities, pollution, etc.) and the decrease in available food sources (gopher, other small rodents) continue to negatively affect large species of birds of prey, such as: the spotted eagle (*Aquila clanga*), the lesser spotted eagle (*Aquila pomarina*), the sacred falcon (*Falco cherrug*), etc.

According to the estimates reflected in the Environmental Strategy for 2024-2030, approved by Government Decision no. 409/2024, the species list index (RLI) in the Red Book of the Republic of Moldova is to be updated for Moldova from 0.969 in 2020 to 0.02% by 2027.

The in-situ conservation of rare and endangered species is ensured by the Protected Areas System of Moldova. In the current pedoclimatic conditions of the

Republic of Moldova, there are 512 species of endangered plants in the risk area (27.4% of the total number). Among the vascular plant species, the most dependent on climatic conditions are the plants from the forest (126 species), steppe (151 species) and rocky (68 species) ecosystems.

The "Alexandru Ciubotaru" Botanical Garden (Institute) ensures the ex-situ conservation of biodiversity and preserves a collection of plant genetic fund of about 11 thousand species, of which: tropical and subtropical plants – 2,517, ornamental floral plans – 1,150, woody plants – 2,000, non-traditional fodder plants – 350, medicinal plants – 300, aromatic plants – 350. In recent years, the genetic fund of the Botanical Garden (Institute) has been supplemented with 1,456 species, including: woody plants – 170, flowering plants. – 601, tropical and subtropical plants – 439, medicinal and aromatic plants – 148, fodder plants – 98.

. In the period 2006–2018, the total area of protected areas of all categories increased from 4.65% to 5.8%. New protected areas were established, including: Orhei National Park, Lower Prut Biosphere Reserve, wetlands of international importance. A project for a new national park – the Lower Dniester – is under development. The National Ecological Network and the Emerald Network support activities to ensure the survival of protected species at European level within the Pan-European Ecological Network and Natura 2000. GIS maps and ecological bases for 165 species of endangered plant and animal species protected by the Berne Convention.

The establishment of the Emerald Network in the Republic of Moldova has made it possible to ensure the conditions for the survival and conservation of species of flora and fauna of European importance, included in Resolution 6 of the Berne Convention. The network consists of 61 sites with a total area of 277900 ha, which corresponds to 8.21% of the country's territory. A total of 154 Emerald species are adopted in the two distinct biogeographic geographic regions – continental and steppe. The list of Emerald species includes a total of 154 species, including: plant species – 14, animal species – 140 (mammals – 13 sp., birds – 80 sp., reptiles – 2 sp., amphibians – 3 sp., fish – 19 sp., invertebrates – 23 sp.

Among the species listed are the lady's slipper orchid (*Cypripedium calceolus*), the barbastelle bat (*Barbastella barbastellus*), the great copper butterfly (*Lycaena dispare*), the black woodpecker (*Dryocopus martius*), etc. In the Emerald Network, spatial data provides a tool to identify and monitor in-situ conservation and assess threats to biodiversity and ecosystems, is accessible on the UN Biodiversity Lab platform[18].

According to the assessment of the species of the Emerald Network in Moldova, the Sufficiency Index for Moldova was calculated at 24.0%. The proportion of insurance of the adopted sites with management plans is 47.5%.

[18] https://unbiodiversitylab.org/es/moldova-increases-protected-areas-in-the-emerald-network-2/

The Red Book

In the Republic of Moldova, there is a negative trend in the state of endangered flora and fauna species. In the present **third edition of the Red Book**[19], it includes a number of 208 species of plants and fungi (150 sp. angiosperms, 1sp. gymnosperms, 14 sp. pteridophytes, 7 sp. bryophytes, 8 sp. algae, 14 sp. basidiomycote, 14 sp. ascomycote), with 88 species more than in the second edition of the Red Book, and 219 species of animals (30 sp. mammals, 62 sp. – birds, 9 sp. reptiles, 9 sp. amphibians, 23 sp. fish, 1sp. cyclostomy, 80 sp. insects, 1 sp. springtail, 1sp. crustaceans, 3 sp. Bivalves), or by 103 species more than in the second edition of the Red Book. Rare and vulnerable species are protected by Law No. LP325/2005 on the Red Book of the Republic of Moldova.

Thus, the first edition of the Red Book (1978) included 26 species of vascular plants and 29 species of vertebrate animals. The second edition of the Red Book (2001) includes 126 species of plants and 116 species of animals, and the third edition – 208 species of plants and fungi and 219 species of animals. The list includes the species of plants, fungi and animals in the following vulnerability categories according to the IUCN: vulnerable (VU), endangered (EN) and critically endangered (CR).

A number of rare species on the territory of the Republic of Moldova, *Cipripedium calceolus, Trapa natans, Carlina acaulis, Vipera ursini, Aythya nyroca* are included in the "Red Book of Europe". **Survival Red List Index** of species for the Republic of Moldova, weighted by the distribution of each species that is present in the country. The species survival index ranges from 1 if the country has contributed a minimum to the Global Index (i.e. if there are no endangered species) to 0 if the country has contributed a maximum to the **Global Red List Index**. A downward trend indicates a low probability of survival of the country species. The index is based on all species of mammals, birds, amphibians, corals, and cicadas native to the country (noting that not all countries have species in all of these groups). Between 1993 and 2018, the red list index changed at an annual rate of 0.02%[20].

Problems in the field of conservation of rare and vulnerable species

Several species of plants and animals in Moldova live at the extremes of their natural habitats, thus increasing their vulnerability due to climate change and anthropogenic factors. As an agricultural country, the biodiversity of crop plants and animals is particularly important to the country's economy. The transformation of natural ecosystems by man has led to their fragmentation, the isolation and decline of

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

[20] http://bipdashboard.natureserve.org/bip/SelectIndicator.html?iso=MDA®=Europe

populations, and the extinction of several indigenous species. The freed ecological niches are occupied by alien species.

Biological diversity is influenced by many processes, such as the degradation of plant associations, the scarcity of food, water and breeding sites, caused by climate change. The increased vulnerability of the plant and animal world in the Republic of Moldova is the result of the low functionality of natural ecosystems. Most natural ecosystems are fragmented and degraded.

In river basins there is an intensification of the process of water eutrophication, in steppe and meadow ecosystems – of the process of xerophysation and substitution with ruderal plants. The cutting down of forests and trees on the banks of rivers leads to an intensification of the water evaporation process and a reduction in the ecological capacity of water basins to maintain a wide diversity of aquatic animals.

Currently, the 4th edition of the Red Book of the Republic of Moldova is in the process of being developed with the support of research institutions in the field of botany and zoology and will be produced on the basis of scientific investigations and monitoring of rare species of spontaneous flora and fauna.

Needs and actions

Target 4. Effectively ensuring the conservation of endangered species included in the Red Book of the Republic of Moldova in order to stop the process of distinguishing them.

To this end, the following actions are proposed:

- Update of the List of species included in the Red Book of the Republic of Moldova.
- Restoration (in-situ) of populations of threatened species
- Ensuring the conservation measures of endangered species included in the Red Book in the management plans of protected areas
- Elaboration of Ecological Passports of Endangered Species
- Ensuring the survival of Emerald species and ensuring the sufficiency index of species through conservation measures and expansion of Emerald sites.

Section 5. Ecosystem services

Biological diversity is the basic component of ecosystems and the generating force of ecosystem services. In other words, all the goods of nature that we

permanently benefit from as part of the processes in nature through which we are provided with livelihoods (water, food) or conditions for the development of society (agricultural productivity, reduction of pollution, etc.) through biodiversity can be attributed to the term ecosystem services.

Ecosystem services (ES) a need to value everything that nature generates and man uses/uses. They can be defined as the multitude of direct and indirect benefits, generated by ecosystems and ensured/offered to humans for a better quality of life. Currently, four distinct types of ES vital to human health and well-being, defined in the Millennium Ecosystem Assessment report, are identified[21]:

Support Services:

These include processes such as nutrient recycling, primary biological production, and soil formation. They make it possible for ecosystems to provide services such as food supply, flood control and water purification.

Supply/Sourcing Services:

It represents a complex of services/goods, such as – (a) food (including molluscs and game), foods of plant/mushroom species, and spices, (b) raw materials (including wood and wood products, skins, organic matter, feed and fertilizers), (c) genetic resources (including genetic material for crop breeding), (d) water (predominantly drinkable, for various activities), (e) biogenetic minerals, (f) medicinal resources (including pharmaceuticals, analysis/testing bodies), (g) energy (hydropower, biomass fuels), (h) ornamental resources (including fashion, handicrafts, jewellery, pets, worship, decorations and souvenirs such as furs, feathers, ivory, orchids, butterflies, aquarium fish, shells, etc.).

Regulatory Services:

These include carbon sequestration and climate regulation, waste management, decomposition and detoxification, water and air purification, disease and pest control, and natural hazard regulation.

Cultural services:

There are more societal benefits, including through the use of nature for recreational purposes, as a motif in books, films, painting, folklore, national symbols, architecture, advertising, etc.

Natural areas provide a number of ecosystem services that are used in local productive sectors and contribute to a set of benefits, presented in **Table 6**.

Table 6. Ecosystem services in natural areas and the link with productive sectors

Type of SE	Service	Benefit/result	Sectors supported by ecosystem services

[21] https://council.science/wp-content/uploads/2017/05/ICSU-UNESCO-UNU_Ecosystem_Report.pdf

Sourcing Services	Food	Game, fruit, freshwater fish and marine specialities harvested for commercial and subsistence purposes	Households, fish farming, tourism, agriculture
	Wood	Timber, firewood and fibre	Households, industry
	Water	Water supply in public system, water for industrial and agricultural use	Agriculture, industry, tourism
	Natural medicines	Natural medicines	Households
	Biochemistry	Biochemistry and genetics	Agriculture
	Ornamental resources	Ornamental resources	Industry
	Power source (fuel, etc.)	Power supply, e.g. energy hydroelectric	Energy
Tuning services	GHG regulation	Carbon sequestration	Possibly all
	Stabilization Microclimate	Air quality	Possibly all
	Water regulation (storage and retention)	Protection against floods and storms	Tourism, industry, households, agriculture
	Water Processing	Water and sediment/waste detoxification	Tourism, industry, households, agriculture
	Substance retention Nutritional	Increasing water quality	Fish farming, agriculture
	Spiritual, religious and cultural heritage	Use of the environment in books, films, paintings, folklore, national symbols, architecture, advertising	Tourism, households
	Education	A "natural field laboratory" for understanding biological processes	Households
	Recreation and Ecotourism	Ornithological observation, hiking, canoeing	Tourism
	Landscaping and leisure	High prices due to the views	Tourism, households
	Non-use biodiversity	Increased well-being associated with, for example, altruistic inheritances or motivations	Possibly all

Source: Bann & Popa, 2012

There is a direct link between ecosystem services and economic sectors that consume natural resources: agriculture, manufacturing industries, energy, tourism, as well as households. They benefit to varying degrees from raw materials, spaces and natural processes that provide their economic foundation.

Inefficient management, waste or environmental damage influence the productivity of most economic sectors. The ecosystem services produced by the natural environment have monetary and non-monetary value and must be provided for a fee, which will create financial funds for the maintenance of natural resources, biodiversity, their restoration and their sustainable functionality. The costs for ecosystem services will include costs related to the management of biological and

ecosystem resources, rehabilitation measures, conservation of valuable species and lands, awareness-raising, information, educational activities, attracting investments for small and medium-sized businesses, preservation of traditional knowledge, etc. (**Table 7).** Those listed require non-degrading development efforts for the environment, intelligent integration into transformation processes (natural or industrial) and ensuring a sustainable balance.

Table 7: Cost categories for harnessing ecosystem services

Biodiversity management	▪ Inventory and mapping; ▪ Monitoring the state of conservation; ▪ Security, implementation of regulations, special protection measures; ▪ Data management; ▪ Reintroduction of extinct species; ▪ Ecological reconstruction.
Awareness, heritage, local development	▪ Traditions and communities; ▪ Awareness and communication from the public; ▪ Environmental education.
Tourism	▪ Recreational infrastructure; ▪ Tourism opportunities and services, information, marketing and promotion; ▪ Managing tourists.
Administration and management	▪ Equipment and infrastructure; ▪ Administrative staff; ▪ Strategic documents and planning; ▪ Staff training.

Source: Study "Economic Value of Biodiversity and Ecosystem Services" (UNDP), 2013

Ecosystem services were assessed on the basis of the annual contribution of biodiversity/ecosystems to sectors of the national economy (such as tourism, forestry, agriculture, fish farming, water supply, climate change and disaster mitigation). The analysis of values and costs showed that ecosystem services in Moldova would bring a number of benefits, such as:

- SE generated amounts to approximately $21986 million US dollars annually;
- The quantified value of the SE is equivalent to about 41% of GDP;
- Multiple sectors benefit from the SE (e.g., in the tourism sector 13% of the value was obtained from the national budget and 78% or $4.6 million by private enterprises, and in the agricultural sector only 11% of the benefits were obtained by the budget and 86% by the private sector);
- SE have a multiplier effect for the entire economy (e.g., the tourism sector alone generates total revenues of $7.9 million, including capital investments of over $1.4 million, along with about 1400 permanent jobs);
- There are untapped opportunities to increase revenue generated by SE (e.g., visitors/tourists are willing to contribute nearly $0.6 million more

annually, under-utilization of pastures below the affordability limit of capacity points to an untapped potential of $127.7 million);

- There is significant public under-investment in protected areas (PAs) that generate significant ES; thus, in 2011 PA administrations received $2.8 million dollars (funding from the state budget - $67,950, own revenues from forest exploitation - $1.126300 million), while $3.7 million is needed to meet basic needs and about $4.4 million for improved development.
- Failure to consider the SE in national policies and investments will generate long-term losses, and the continuation of BAU ("business as usual") practices could produce additional costs for the national economy.
- Investment in sustainable ecosystem management (SEM) practices will generate added value for the economy, generating growth of more than $1932.11 million over the next 25 years.
- Enforcement and combating illegalities will ensure the sustainable management of ecosystems, e.g., illegal fishing will not be countered, the value added to the economy by the fisheries sector and related industries could double in 25 years with the same budget investment, which means an added value of $26.9 million.
- Well-managed ecosystems can significantly reduce flood damage, soil erosion and landslides; For example, if the upstream protection functions of ecosystems were improved by 10% (i.e., the contribution to minimizing the impact of the disaster were increased), then the value of flood control ecosystems in terms of avoided costs would be equivalent to about $13.4-19.7 million annually.

Forest Ecosystem Services Assessment (SEF)

The main benefits of SEF generated by forests for the country's population and economy, and local communities are of major importance, given that 54% of the country's population lives in rural areas and are in economic interactions with forest ecosystems[22].

Favoring the application of the SEM development scenario and not the BAU business scenario will bring added value to the forestry sector, local communities and the national economy:

- SEF values for several sectors of the national economy (such as tourism, forestry, agriculture, water supply, climate change, and disaster mitigation) have been estimated at $68.84 million annually.

[22] ENPI-FLEG https://www.enpi-fleg.org/

- The quantified value of SEF, for only a few sectors, was equivalent to 0.85% of GDP (being 3 times higher than the official figure representing the contribution of the forestry sector to the national economy of about 0.3% according to data from that time).
- Moreover, sectors of the national economy, implicitly the public and private sectors, benefit directly from the SEF; Thus, in the tourism sector, 20% of the value supplemented the state budget, while 65% (or $1.5 million) was obtained by private companies; In the agricultural sector, only 8% of the benefits were obtained by the state budget ($1.7 million), and the private sector obtained 89% of the revenues.

It should be noted that there are also untapped opportunities with various possibilities for families to generate income through the development of sustainable businesses, and the sectors with prospects are tourism and agriculture.

In the case of the implementation of the sustainable ecosystem management (SEM) scenario, the added value in the forest sector and related industries can increase by up to 30% more revenues to the state budget, if illegal logging is combated. And that's just what it would mean to eliminate the extraction of exaggerated volumes of wood from the forest.

Economic assessment of the SE and wetland biodiversity

The Republic of Moldova has three wetlands of national importance (Ramsar areas), which are known as true oases for biological diversity, although their condition is becoming increasingly deplorable due to very high anthropogenic pressure (fragmentation and overexploitation). The largest wetland, the Ramsar site "Lower Dniester" (60638 ha),[23] served as a case study for a first experience of economic assessment of wetlands at national level[24]. The reference value was identified based on the average per hectare, ranging from the minimum average value of $3520 US dollars to the maximum average value of $6705 US dollars. This large difference, about twofold, shows how much the habitat types in this area vary, the economic potential of the ecosystems and how vulnerable they are.

A recent study on the social and environmental impact of the Dniester Hydropower Complex (CHN) on the Dniester River showed that 75% of the ES are provided by aquatic ecosystems, 22% by wetlands and 3% by forest/herbaceous ones, and the cost of ES lost due to CHN amounts to tens of millions of dollars. Fish populations have been significantly reduced, and the amount of fish caught has decreased by 4-5 times compared to the period prior to the construction of the CHN (the number of fish with high and medium economic and ecological value has

[23] Pagina oficială a Convenției Ramsar (https://rsis.ramsar.org/ris/1316).

[24]

decreased by at least 40 times, with fish of low value multiplying in their place). The losses in the supply ES are obvious and easy to calculate, and the costs of the control ES lost by modifying the functionality and productivity of forest and wetland ecosystems remain much underestimated (annually, about 20 ha of forest with the presence of common oak undergoes unfavorable changes). Costs may increase, especially in terms of the lost potential for climate change regulation and mitigation (carbon absorption, assimilation potential), water self-purification, or maintaining habitats for biodiversity-rich with internationally protected species. All these invoke missed costs for the local population and lower budget revenues due to the degradation of landscapes, respectively the reduction of existing and potential cultural ES (especially the tourism, leisure sector, etc.).

Challenges for improving the legal framework for planning and managing the space occupied by natural ecosystems

Currently, the national legislation does not impose express solutions/commitments for the application of calculation models to the use of environmental factors and ecosystem services on the developed territories. It is imperative to promote the following actions:

- Elaboration of principles of economic capitalization of environmental resources and ecosystem services in the legislation related to territorial planning and urbanism.
- Elaboration of relevant forecasts (territorial development planning) regarding the evolution of environmental factors, their impact in the future, possible development scenarios.
- Promoting in the national territory planning documents both the measures for the conservation of natural resources and the capitalization of the potential of environmental services.
- Developing the necessary tools to monitor the appropriate correlation of the development scenarios forecasted in the environmental strategy with the other sectoral strategies and the territorial planning documentation.
- Elaboration of the necessary tools for monitoring the application of environmental legislation and correlation with other strategic documents in territorial planning.
- Develop clear criteria for the quality system in construction, including on the dimension of sustainable use of natural resources, ecosystem services and biodiversity.
- Elaboration of the necessary instruments for the proper application of the methodology of public inquiry on environmental problems/options in territorial bakery.

There is a lack of relevant tools and methodologies for territorial planning documentation and the capitalization of ecosystem resources, such as the following:

i) a clear set of indicators suggestive of the potential of the natural environment, for the relevant mandatory compartments in the spatial use planning documents (national, regional, district, local); (ii)
ii) elaboration of the methodology necessary for the proper application of the provisions establishing the way in which LPAs identify, inventory, conserve, capitalize and control the natural and built values of local interest, as well as the establishment of the boundaries of the protected areas and the regime of activities
iii) developing the clear methodology regarding the technical-economic calculations for the land/buildings with a destination relevant to the protection of the environment and natural resources, including with a view to the clear and impartial assessment of the capacities of the affected ecosystems.
iv) developing requirements for certified technical experts participating in the expertise of complex projects, including the analyses and evaluations necessary to establish the economic efficiency of environmental projects;
v) developing the methodology necessary for the proper application of the provisions establishing the right to compensation for losses related to the negative influence on agricultural and forestry production, as well as on land degradation
vi) The elaboration of relevant forecasts (territorial development planning) regarding the evolution of environmental factors, their impact in the future, possible development scenarios will contribute to a higher and more efficient percentage of coherent capitalization of natural ecosystems.

Needs and actions

MD Target 11: Restoration, maintenance and enhancement of nature's contributions, including ecosystem services in sectors of the national economy, particularly at local/community level

- Study on the evaluation of the monetary and non-monetary costs of ecosystem services
- Improved practices regarding the inclusion of ecosystem services in territorial planning by LPAs.

Section 6. Forests and forest ecosystem services

Forests are the main element for ensuring the ecological balance in this geographical space. Thus, the issue of conservation and sustainable development of existing forests, as well as the expansion of forest lands by afforestation of new areas unsuitable for agricultural use, is a problem of national interest, which is reflected in the ***National Program for Forest Extension and Rehabilitation for the period 2023-2032,*** approved by Government Decision no. 55/2023.

The area covered with forests in the Republic of Moldova has varied considerably over time, from 366.2 thousand ha in 1848 to 222.0 thousand in 1945, and will reach 370 thousand ha in 2022 or about 11.2% of the country's territory. These fluctuations were determined by national circumstances and priorities in certain periods, but also by the political/geopolitical/administrative context at certain stages:

- radical changes in the state organization and structure (1812; 1918; 1944; 1991);
- the mass destruction of forests during the First World War;
- nationalization by redemption of private and religious forests after the union of Bessarabia with Romania (period 1918-2023);
- forest extension programs from the periods 1950-1990, 2002-2009, 2014-2018.

According to the provisions of the Land Cadastre (as of January 1, 2024), **the area of the forest fund** is 456.3 thousand ha (2022) or 13.4% of the territory of the Republic of Moldova. Most of the lands of the forest fund – 362.8 thousand ha (80.2%) are in the public property of the state, the rest being owned by municipalities (LPAs) with 86.7 thousand ha or 19.2% and only 0.6% by private owners. The area of land covered with forests is 380.8 thousand ha (forest fund and other destinations) or 11.5% of the country's land area[25], including state property: 325.7 thousand ha (85.5%), of which 304.3 thousand ha is the "Moldsilva" Agency (93.4%); public property of the TU – 52.5 thousand ha (13.8%); 2.6 thousand ha in private property (0.7%). In general, the area covered by forests in the Republic of Moldova has varied considerably over time, from 366.2 thousand ha in 1848 to 222.0 thousand in 1945, and will reach 381 thousand ha in 2023 or about 11.5% of the country's territory (**Figure 2**).

[25] Suprafața RM fără terenurile ocupate de ape (3310,1 mii ha).

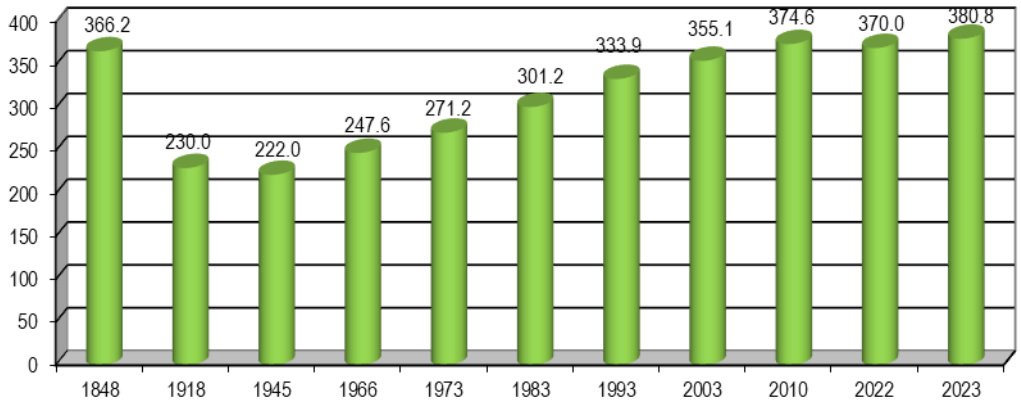

Figure 2: Evolution of forest areas in the Republic of Moldova in the period 1848-2023, thousand ha

Source: ÎS. Institute for Forestry Research and Planning

The forests of the Republic of Moldova have suffered a series of damages due to **biotic and abiotic causes**. Moreover, the impact of climate change, which has a clear latitudinal effect through rising temperatures and drought, especially in the south of the republic, is already observable. Flora species in the southern part of the country are already suffering as a result of decreased rainfall and rising temperature. Climate change is certainly leading to an increase in biotic damage, tree species becoming more sensitive to pest attacks (cvercinea, ash, willow, acacia, elm, etc.). The development and maintenance of compositionally diverse and climate-adapted forests is a significant challenge and will require urgent research measures in the field of species selection, adaptive provenances and genotypic studies of native species.

The analysis of the current horizontal structure of forests in the Republic of Moldova (**Figure 3**) shows that the species with a higher area than the others is acacia, with a share of 33.1%. The cvercineas amount to a proportion of 28.7% (pedunculated oak – 14.8%, gorun – 12.0% and downy oak – 1.9%). The species that have a share of over 3% are: ash – 7.8%, hornbeam – 5.3%, linden – 3.5% and walnut – 3.1%, acacia – 29.5%, downy oak – 2.2%, maple – 1.7%, white poplar and field elm with 1.5% each, willow – 1.0%, various hardwoods – 9.2%, various softwoods – 1.5%, various soft – 0.8% and various exotic – 0.1%.

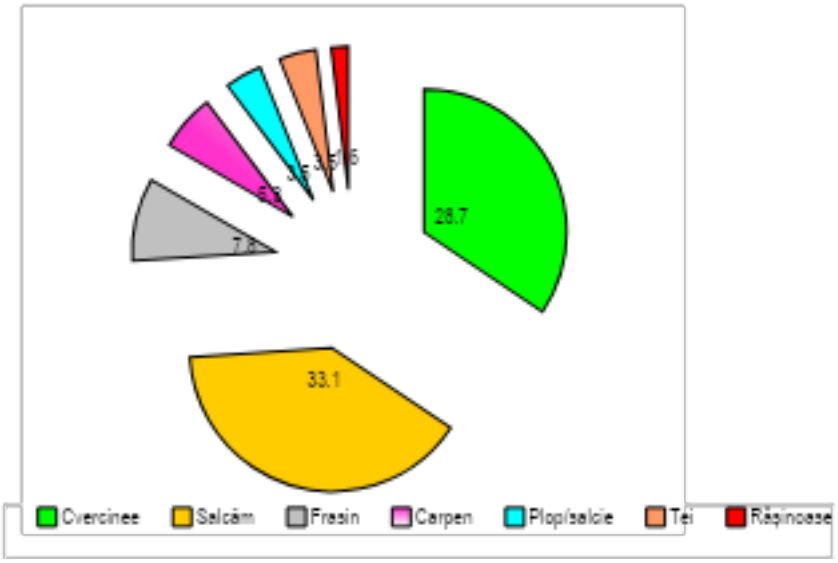

Figure 3. Composition of forests on the territory of the Republic of Moldova, %

Source: I.P. Institute of Forestry Research and Planning

According to the data of the SS. Institute for Forestry Research and Planning, about a third of the stands within the forest fund managed by the state forestry bodies are made up of artificially introduced species, which are not part of the natural ecosystems of Moldova. In the period 1989-2023, the total area of cvercineas, although it increased by about 20 thousand ha, their participation in the structure of forests decreased by 10.9%. At the same time, it is necessary to mention that this is a general trend in Moldova's forest structure recorded over the last 90 years. Thus, the total area of forests increased from 234.2 thousand ha in 1925 to 370.7 thousand ha in 2020 or +146.6 thousand ha (+63%). Against the background of this increase, the share of acacia trees has halved, with a considerable increase in the share of acacia and softwoods. It should be noted that these changes were partly influenced by the events of the period 1940-1945, when the territory on which the Republic of Moldova is located today underwent some administrative changes.

Other indicators that characterize the current forests in the Republic of Moldova:

- general average production class – 3.9 (including gorun – 2.8, downy oak – 3.0, linden, white poplar – 3.1, ash – 3.4, oak/hornbeam – 3.6, etc.);
- general average consistency – 0.76;
- total timber volume per foot – 44933.0 thousand m3, equivalent to an average volume per hectare of 118 m3, achieved at the average age of 45 years, and the current average growth – 3.8 m3/year/ha. According to the volume stored on the leg, the cvercines hold about half of the total

volume (49.0%). An average volume per foot higher than the general average is recorded by the following species: linden – 238 m3/ha, holm oak – 234 m3/ha, ash – 195 m3/ha, oak – 184 m3/ha, hornbeam – 152 m3/ha.

Compared to other countries in the region, the Republic of Moldova has very low indicators specific to forest resources. Thus, for each inhabitant there is 0.095 ha, 11.3 m3 of wood per foot and only 0.16 m3/year of **harvested wood**. The forests of the Republic of Moldova are dispersed in 3626 forest bodies with an average area from 5 ha to 5550 ha, being located in the area of activity of 920 administrative-territorial units (ATU)/town halls. From a territorial point of view, about 57.7% of the area of land covered with forests and other types of forest vegetation belongs to the Central area of the Republic of Moldova, the Northern area has 26.6% of the respective lands and only 15.7% to the South area. Another aspect worth mentioning is the fact that according to the main characterization indicators (current average growth; average wood volume per foot, etc.), the forests in the Republic of Moldova achieve lower values compared to the forests in the neighboring countries, Romania (current average growth: -23.9%; average wood volume per foot: -65.3%) and Ukraine (current average growth: -5.0%; average wood volume per foot: -45.9%).

The comparative analysis of the creditworthiness of forest resorts, the productivity of forest types, as well as the current productivity of stand elements, finds some deviations with negative trends for forests in the Republic of Moldova (**Table 8**). Thus, the current average production class is about 13% below the potential indicator (Production Class (CLP) – 3.4). The achievement of this goal will be achieved only through the profound improvement of forest management, including through the gradual substitution (including ecological reconstructions) of degraded, inadequate stands, etc. These activities require substantial institutional and financial efforts. The development and promotion of internationally funded projects is a sure way to solve problems related to finance and transfer of new technologies.

Table 8. Comparative analysis of the capitalization of the stationary potential by the current forests

Indicators	Creditworthiness/productivity categories		
	superior	Medium	Lower
Resort creditworthiness (%)	15,5	42,6	41,9
Productivity of forest types (%)	13,7	43,6	42,7
Current productivity of species/stands (%)	9,4	33,8	56,8
Current average production class		3,9	
Average potential production class		3,4	

Source: Ion Talmaci, Erii Prosii, Ala Mardari, Alexandru Varzari, Alexandru Galupa (2016), Report on updating the basic indicators of forests and other types of forest vegetation in the Republic of Moldova. Office for Climate Change, 98 p.

Climate change, manifested mainly by global warming and the intensification of extreme natural disasters, greatly affects forest ecosystems and associated biological diversity, because the Republic of Moldova is located in a region with a high degree of vulnerability and frequently faces heat waves, forest fires, droughts, etc. The period of the last 20 years has manifested itself with a high intensity of extreme phenomena, such as droughts, hail/frost, which are a stressful factor for the health of forest ecosystems. Forecasts for the next century on the evolution of the forests of the Republic of Moldova (World Bank, 2015) assume that the longitudinal gradient will shift northwards, and the health (phytosanitary) status of forest ecosystems will worsen. It is undeniable that forests will be directly or indirectly affected by climate change, and forest managers in vulnerable areas will be affected quite strongly.

Forest ecosystems provide important supply services thanks to wood and non-wood forest products that are part of the forest economy. Thus, forest ecosystem services (SEF) refer to a flow of resources or services from the natural environment that directly or indirectly benefit humans, being classified into the following four categories[26]:

- Provisioning services refer to tangible products such as timber/timber, non-forestry products, fish, pharmaceuticals, etc. provided by ecosystems;
- Regulation services refer to natural ecosystem processes, such as carbon sequestration and water regulation, that contribute to social well-being;
- Cultural services refer to the non-material benefits obtained from ecosystems, for example, through tourism and education or aesthetic experiences;
- Support services are required for the production of all other SEFs (e.g. soil formation, nutrient circulation, photosynthesis, primary production, etc.). They differ from other services either in that their impact on people is either indirect (through provisioning, regulation or cultural services) or occurs over a very long time. **(Table 9).**

In addition to the important regulation of ecosystem services addressed to the water supply and disaster risk reduction sectors, their value of wood supply was estimated at 28.3 mln. dollars.

Table 9. Forest ecosystem services and associated benefits

[26] Universitatea Transilvania din Braşov (UTB), Facultatea de Silvicultură şi Exploatări Forestiere (2015), Evaluarea Serviciilor Ecosistemice Forestiere (SEF) din Republica Moldova. Raport tehnic în cadrul Programului ENPI FLEG II, 89 p.

Types of services	Services	Benefits/results
Supply	Groceries	Game, fish, fruits, berries, mushrooms, etc.
	Wood	Round wood, lumber, firewood, etc.
	Water	Water supply services, water for use in industrial and agricultural purposes
	Natural medicine	Natural medicines (herbs)
	Ornamental resources	Seedlings and ornamental plants, winter trees, etc.
	Energy sources (fuel, etc.)	Firewood, mining debris, etc.
Regulatory Services	GHG regulation	Carbon sequestration
	Microclimate stabilization	Air quality, temperature regulation and evapotranspiration
	Water regulation (accumulation and retention)	Flood and storm protection
	Waste processing	Detoxification of water, sediment/waste
	Nutrient retention	Improving water quality
Cultural services	Recreation and ecotourism	Admiring landscapes, birds and animals, hiking, etc.
	Education	A "natural field laboratory" for understanding biological processes
Cultural services	Spiritual, religious, natural heritage	Use of forest issues in books, films, painting, folklore, national symbols, architecture, advertising

Source: Technical report under the ENPI FLEG II Programme.

Currently, the forestry sector is affected by illegal logging and little attention to non-timber forest products. In the case of a sustainable ecosystem management scenario, with the decrease of illegal logging and the growing interest in the potential of non-timber forest products, the net present value for 25 years (10% rate) is estimated at 578.8 mln. dollars. Even if the contribution of forest supply services to the economy of the Republic of Moldova could decrease in the near future, the benefits will still outweigh the losses.

Major causes of forest degradation

The lack or major deficit of forest fund management capacities within the TAU's structures is probably one of the most serious problems at the moment. Its magnitude is largely confirmed by the results of the revisions carried out in 2011 by the specialists of the territorial forestry enterprises jointly with the employees of the Environmental Protection Inspectorate. This event is a milestone, as it is the last complex revision of the UAT forests carried out in the Republic of Moldova. After this, only sporadic/singular revisions and operative controls (raids) were carried out, which do not fully reflect the seriousness of the problem.

The share of private forests is small and constitutes only 0.6% of the total in the Republic of Moldova or 2.2 thousand ha. An important aspect is that the respective lands are owned by about 4.5 thousand owners, which denotes a high degree of dispersion and that the process of establishing the private forestry sector is still at the

early stage. At the same time, the main land reserves for the expansion of forest areas are privately owned. It is important to mention that the area of forests located on private land is actually larger. The case studies carried out by ICAS in the period 2015-2017 in the pilot districts of Nisporeni and Ungheni confirm the presence of important areas of forests/forest vegetation (500-800 ha) at the district level, which, according to land records, is found in other categories: multiannual plantations, fallows, arable land, pastures, etc.

The national forest sector is subject to major challenges, such as ***poaching or illegal logging***, which only worsen ecosystems and thus vulnerable, exposing many rare species to the risks of local extinction. The considerable losses caused to forests by illegal logging are estimated at about 400-600 thousand m3 annually. The objective of increasing the area of protected areas and expanding forest vegetation requires an appropriate correlation with the institutional framework.

Climate change, manifested mainly by global warming and the intensification of extreme natural disasters, greatly affects forest ecosystems and associated biological diversity.

Degradation and fragmentation of natural habitats in the Republic of Moldova is due to both abiotic (climatic), biotic (insects, diseases) and anthropogenic factors (deforestation, hunting, etc.). Forest habitats, along with steppe and petrophy habitats, are the most dependent and vulnerable to climatic conditions in the region. ***Increased vulnerability*** of these ecosystems is the 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 in the groundwater level, the worsening of the evapo-transpiration regime, etc. Thus, the research shows that the soil moisture in some habitats at a depth of 1.5 m was 9.3%, and the threshold for worsening the condition of the plants was 9%. At the same time, the mesophilic forests of Central Europe (beech, hornbeam and oak) in the north and center of the country are at the southeastern limit of its natural zone, and the climate is the main factor limiting the spread of these forests. Dry years can lead to a reduction in mesophilic forest area, which will tend to recede in favor of white oak forests in the south of the country.

At present there are no arguments regarding the evolution **size of forest fragmentation**. The first calculations on forest fragmentation in Moldova were presented in 2016[27]. Thus, the fragmentation of forested areas, i.e. the division of integral forest bodies into isolated and remote fragments, consequently affects natural ecological processes 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 was quantified using the ratio between the perimeter of the forest body and its surface. **Average surface area** of forest bodies in the country is approximately

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

91 ha, varying considerably depending on the region. The average area of forest bodies in the central part is more than 1.6 times larger than those in the south and 1.4 times larger than the northern part of the country. If the acacia plantation will be excluded from the analysis of the forested territory, 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 **fragmentation coefficient** of these forests increased considerably to 22.47 (4 times), the highest being in the south (24.85) and the lowest in the center (19.25).

Approximately 73% of the stands come from shoots, and 2/3 of the area of the forest fund formed by stands has a state of **poor health** with reduced stability to the action of destabilizing biotic and abiotic factors. Analysis of the health status of the forests of the Republic of Moldova shows that the area **outbreaks of diseases and pests** annually it constitutes from 5% to 31% of the total area of the national forest fund, and the general trend is to increase these areas. The main species of defoliating pests in the forests of the Republic of Moldova are: Green oak moth (*Tortrix viridana*), the Green Cotarul (*Operophtera brumata*) and the brown cot (*Eranis defoliaria*), Oak Hairy Caterpillar (*Lymantria dispar*), Ash leaf thrush (*Stereonicus fraxini*) etc.

The simultaneous action of biotic and abiotic factors has led to ***Drying of forests***, including in the "Plaiul Fagului" Scientific Reserve where the use of insecticides is prohibited. Thus, it is possible that, due to massive defoliation, after 10–15 years intensive abnormal drying can be expected in the ash stands, which are currently defoliated from 51 to 100%, changing the habitat on an area of 700 ha of the "Plaiul Fagului" protected area. An estimate of the damage caused by the phenomenon of abnormal drying or those caused by the mass appearance of insects and defoliation has not been carried out.

Hygienic thinnings and cuts They are punctual interventions in stands to improve the health of the forest and do not radically modify the habitat.

The conservation care works in 2022 were carried out on an area of 3147 hectares, ecological reconstruction - 435 hectares; regeneration - 1722 hectares; clearing and cleaning - 3928 hectares; hygienic pruning - 7912 hectares; Care and management works - 15844 hectares; Forest care works - total - 22217 hectares; Regeneration, conservation, reconstruction cuts - 5304 hectares; Miscellaneous felling - 1069 hectares **(Figure 4).** On this area, the forest habitats were changed for new ones and forest habitat regeneration works were undertaken. As a result of the activities, a volume of 1757 thousand cubic meters of wood was harvested.

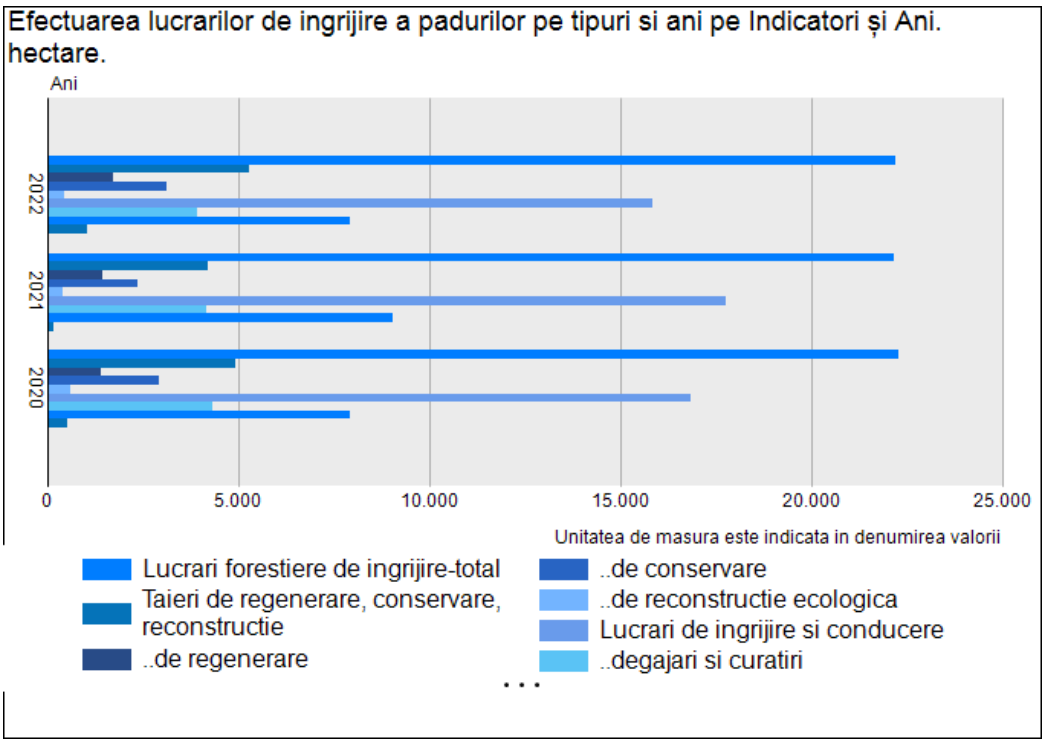

Figure 4. Carrying out forest care works by types and years, ha
Source: National Bureau of Statistics[28]

Illegal logging it poses a threat to forests and is one of the biggest causes of biodiversity loss. According to the annual reports of the State Ecological Inspectorate, **Total volume** of illegal logging in the period 2010–2017 was 6582.32 m3 (about 4800 cases, damages caused by about 6.57 million lei), especially in the forests managed by LPAs.

Needs and actions

The National Program for Forest Extension and Rehabilitation for the period 2023-2032 and the Action Plan for its implementation for the period 2023-2027 (PNERP) will provide the necessary technical-financial support to encourage the planting of trees/shrubs both on new land (through afforestation) and on land with inadequate or heavily degraded forest vegetation (through reforestation/rehabilitation).

The PNERP program aims to expand the areas covered with forest vegetation up to at least 15% of the republic's surface by 2032, increase the productive potential by 10% compared to the existing one, new forest plantations on 110 thousand ha and

28 https://statbank.statistica.md/PxWeb/pxweb/ro/10%20Mediul%20inconjurator/10%20Mediul%20inconjurator__MED050/MED050400.px/chart/chartViewBar/?rxid=b2ff27d7-0b96-43c9-934b-42e1a2a9a774

rehabilitated land on 35 thousand ha, reduce the area of degraded land by 45 thousand ha, etc.

Among the actions included in the PNERP are the reduction of the area of heavily eroded land by 15 thousand ha by 2032, the strengthening of the hydrological carcass by afforestation of 15 thousand ha of riparian strips, the reduction of soil erosion processes and the protection of about 350 thousand ha of agricultural land by creating 10 thousand forest curtains to protect agricultural fields, the increase of about 860 million seedlings, the strengthening of forest fund management capacities by digitizing processes and improving the legal framework regulating the field.

Forest management must be adjusted to the current situation and to a scenario influenced by climate change by optimizing all components of the system. The principles of sustainable management with the promotion of species and techniques / technologies that will cope, can ensure long-term development with the conservation of the resource for a longer period. The trade-off can be identified at the dividing edge ***of intensive management*** forests (of economic interest) and ***conservation forests*** (aiming at carbon sequestration; protecting biological diversity in the long term; contributing to improving climate resilience for other sectors (agriculture; water, etc.).

Climate change is the most important argument in promoting a ***green economy in forests***. Strategic activities – regeneration, afforestation, extension, guarding/protection, etc. – need to be budgeted through strategic sustainable programs, which support the continuity and functionality of forests, through climate change adaptation actions.

The problems identified in the forest sector refer primarily to ***the inadequate management of the forest fund***, the low bioproductive potential of forests, the insufficient protection and protection of the forest fund, as well as the slow rates of expansion of forest areas.

At the same time, the sector faces serious problems related to ***the insufficiency of the institutional*** *and management framework for the complexes of natural areas protected* by the state and ***the lack of sources of financing*** necessary to ensure the established regime and their sustainable management, the insufficient dimensions of the areas of the natural areas protected by the state, as well as of the areas covered with forests, insurance and development insufficient sustainable management of forests, green spaces, meadows, wetlands, continuous degradation of protective forest curtains that cause loss of habitats and ecosystems.

Needs and actions

MD Target 9: Sustainable management of wildlife species in the forest fund improves, providing social, economic and environmental benefits

- Extension of the forest area managed in accordance with long-term sustainable forest management plans (forest management);
- Establishment of a system for monitoring the timber cycle and timber trade and its adjustment to the WTS international traceability system

MD Target 10: Sustainable management of agricultural areas, aquaculture, fisheries and forestry

- Implementation of silvo-pastoral arrangements in order not to admit the over-exploitation of habitats and to ensure a long-term development of biodiversity
- Improved and compliant production, marketing and use of forest material
- Capacity building of private and communal forest nurseries
- Elaboration of the legal framework on regulations in the field of fisheries and aquaculture
- Creation and/or rehabilitation of silvopastoral and agroforestry systems

Section 7. Sustainable wildlife management

Wildlife of hunting interest in the Republic of Moldova

Hunting fund It is delimited into 80 zones from 16 state-owned forestry enterprises, including 56 forestry districts. Currently, the fund occupies 234.2 thousand ha, including 132.8 thousand ha of forests (56.7%) and 101.4 thousand ha of land (43.3%) located in the area of 500 meters around forests (gardens, vineyards, pastures, fallows, degraded lands). The area occupied by the hunting fund is approximately 38% of the total forest land in the country or twice as large as the forested area of the natural areas protected by the state. The largest areas of hunting grounds are located in the areas administered by the Chisinau, Edinet and Orhei State Forestry Enterprises.

Hunting activity on the territory of the Republic of Moldova is regulated by a special regulation of the Society of Hunters and Fishermen of the Republic of Moldova, by the national environmental legislation, by other regulations in force. According to the Society of Hunters and Fishermen of the Republic of Moldova, there are 15,000 licensed hunters, which shows an increased interest, and the demand for hunting activities is much higher than the real hunting resources of the country.

The hunting fund in the Republic of Moldova is regulated by Law no. 55/2024 on hunting and the protection of the hunting fund. The law regulates the relations in the field of management and administration of the national hunting fund and contains provisions regarding the basic requirements regarding the establishment and organization of a hunting fund. Thus, it will be able to be established on a land of at least 5000 hectares. Each hunting fund will be drawn up a map-scheme, a sheet and a management plan. The hunting funds are assigned in management, directly, or through an open auction. The management of the hunting fund is carried out on the basis of a management contract, concluded for a period of 15 years, with the payment of the annual payment. The authority responsible for exercising state control over the national hunting fund is the Environmental Protection Inspectorate. The structure indicators regarding the hunting household are presented in **Table 10.**

Table 10. Structure indicators regarding the hunting household

Indicators	**2000**	**2005**	**2010**	**2015**	**2020**	**2021**	**2022**
The area of hunting lands, *thousand ha*	339,0	343,0	318,5	336,7	335,1	335,1	335,1
of these, managed	173,0	343,0	289,8	336,7	335,1	335,1	335,1
Expenditure on animal protection and reproduction Wild *thousand lei (current prices)*	647	1 095	1 403	5 281	4 232	2 012	2 400
Total expenditure on fund management Hunting *thousand lei (current prices)*	1 179	2 061	3 798	5 281	5 145	4 951	5 322

Source: Statistical Yearbook 2023

Analysis of seasonal and multiannual population dynamics species of hunting interest**,** Depending on the state of the habitat and the trends of their evolution in the context of anthropo-climatic changes, they allow highlighting the determinants of population evolution and developing recommendations for streamlining ecosystem

services and conserving the fauna diversity of ecosystems, optimizing the herds of species of hunting interest, in conditions of functional stability and resistance of populations. The species of hunting interest, for the given region, include a spectrum of species that correspond to requirements with population, ecological and traditionally useful characteristics in the practice of human communities, and their numbers are in close correlation with the support capacities of the populated ecosystems, specific to each species and which depend on a number of factors with a certain quantitative and qualitative level: climatic, trophic, shelter, predators and pests, parasitological, anthropogenic virotic.

Game species

The sustainable management of game species consists in maintaining the populations of the species at the supporting capacities of the ecosystems by applying biotechnical measures, the formation of a reproductive stock with efficient physiological, morphological and reproductive potential, removing both the phases of numerical depression and the excessive increase of the herd at the peak phases of the numerical cycle, thus maintaining the ecological balance in the ecosystem's food chains.

In the period 2008–2018, an average of 507 deer, 4845 roe deer, 2009 wild boars, 8184 rabbits, 5105 pheasants, 5102 foxes, 1024 badgers, 525 rooks, 785 geese, 1676 ducks and 1765 partridges were evaluated annually in the forestry enterprises subordinated to the "Moldsilva" Agency.

Starting with 2011, the appearance of the wolf species in hunting grounds has been observed. During the reference period, there is a gradual increase in the number of herds from 50 to 90 specimens. The herds of the other species fluctuate from one year to the next. Even though roe deer hunting has been prohibited since 1995, the increase in its herd is below the annual increase. It should be noted that hunting was banned by the Ministry of Environment between 2015 and 2016 for all species of hunting animals.

The arid climatic conditions of 2020 considerably reduced the annual increases for most species of hunting interest and as a consequence, we had harvest quotas, on average, 28% lower compared to the previous season – higher at *quails and geese* (40 and 39 % corresponding), more moderate in *Pigeons* (18 %), *Rabbits* (21 %) and *ducks* + *ducks* (22 %). Higher quotas were approved only for *pheasant* (108%), thanks to the massive populations of the previous year (about 35 thousand pheasants) and a significant increase in the breeding stock (over 70%).

The last hunting season began after a very unfavorable period of drastic drought, which resulted in a reduction in reproductive productivity and survival in mammal and poultry species, especially observed in the *pheasant*, resulting in the effectiveness of extraction in the hunting season with only 74 % of the approved

quota. *Rabbits* 89 % of the expected share. At *migratory species of birds in the hunting spectrum, the results were closer to the approved quotas (93 % in pigeons*, 96% to *quails and ducks*) and only *Geese* were drawn at only 78% of the quotas.

Assessments of sedentary game species, carried out concomitantly with hunting at *Rabbits* in 56% of the district branches of the Society of Hunters and Fishermen of Moldova (SVPM), highlighted that about 6130 hunters participated daily in the environment, exploiting over 100 thousand ha of hunting ground, thus making up 4% of the republican hunting fund (2.54 million ha). Having 6 active hunting days in the season, we find that the evaluations included about 25% of the total fund, representing all administrative-territorial areas.

Measures to reduce consumption in the hunting sector.

One of the effective activities is the organization of breeding enterprises in the country. In the Republic of Moldova, wild bird breeding is practiced: native bird species – partridges and quails, foreign species – pheasants and guinea fowls. Measures to combat poaching are undertaken by the Environmental Protection Inspectorate and the "Moldsilva" Agency. In 2017, the total number of poaching cases detected was 328, which caused total damages of 243.6 thousand lei.

In order to ensure the restoration and maintenance of the fauna of hunting interest, it is necessary to develop mechanisms and procedures for the sustainable use of the hunting fund by applying friendly practices and game culture.

Harvesting/collection of non-wood products

The harvesting/collection of non-wood products (fruits, seeds, medicinal plants, etc.) is an important direction in the structure of the activities undertaken by the entities subordinated to the "Moldsilva" Agency. The volumes of harvesting/collection, processing and sale of non-wood products from the forest vary depending on environmental factors and market requirements. The total volume of PAP collected/harvested in the period 2011–2017 and their commercial value is 597.0 tons for wild fruits and berries, medicinal plants – 64.0 t, honey – 4.3 tons.

Medicinal plants

The pharmaceutical, perfumery and cosmetics industries also benefit from local biodiversity resources. Medicinal plants are usually collected from nature, while the National Botanical Garden (Institute) "Alexandru Cebotaru" has a genofund of about 300 species of medicinal and aromatic plants. The Center for Cultivation of Medicinal Plants (CCPM) occupies an area of 13 ha and holds a collection of over 200 taxa from 15 pharmacotherapeutic groups. In the Republic of Moldova, the resources of medicinal plants and aromatic plants are very diverse: a flora of 3700 species with special curative properties, of which 384 are recognized within the World Health Organization as medicinal plants with pharmacodynamic properties and a well-defined effect.

Out of the 26 manufacturers of medicines in the Republic of Moldova, 17 produce phytopreparations, plant products and medicinal plants, and of the 1,156 medicines manufactured in the country, 238 (20.59%) represent 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, the Republic of Moldova was one of the largest producers of aromatic plants and volatile oils, in this sphere there were 20 enterprises that, in addition to traditional aromatic plants such as rose, mint, lavender, sage, dill, fennel, cultivated hyssop, cinnamon, lemon wormwood, sweet wormwood (annual production of about 200 tons of oils).

Pollinators

The pollinator group includes wild insects, especially from the family *Apiidae*, which include bees and bumblebees. In addition to the crops used by humans, 90% of wild plants depend on pollination by insects.

According to data presented by ANSA, there are 9,421 licensed beekeepers in the Republic of Moldova who hold an apiary passport. Of these, 3,319 have a legal form of activity. In 2023, honey production was about 5,500 tons, similar to that of 2022. At the same time, last year, the amount of honey exported was 1,715 tons. The main markets were those in Europe and Asia.

In the Republic of Moldova, the breed of bees *Apis mellifera carpatica* is present. A number of 35 invertebrate species, important for plant pollination, are included in the third edition of the Red Book of the Republic of Moldova. The Parliament amended the Law on Beekeeping in 2017 and established new principles in beekeeping.

Helioculture or snail growth (*Helix pomatia*), is currently on the rise in the Republic of Moldova, is supported by the Government through several programmes (e.g. PHARE 1+1, etc.) and aims to create a network of snail farms. The average annual extraction of snails is 0.86 tons. Sericulture or silkworm breeding (cocoons, larvae, eggs) has begun to be strongly promoted in recent years in the Republic of Moldova as well.

Needs and actions

MD Target 9: Sustainable management of wildlife species in the forest fund improves, providing social, economic and environmental benefits

- Benefits of sustainable use of wildlife identified and considered in the forest fund management planning process

- Create a mechanism to regulate the sustainable use of non-wood products from forests.
- Promoting sustainable consumption of non-wood forest products by creating the local market and increasing product processing capacities
- Elaboration of mechanisms and procedures for the sustainable use of the hunting fund by applying friendly practices and game culture

MD Target 10: Sustainable management of agricultural areas, aquaculture, fisheries and forestry

- Measures to halt the decline of the pollinator population, maintain and restore pollination as an ecosystem service

Section 8. The harvesting, use and trade of wildlife species is sustainable, safe and in accordance with the provisions of national legislation and the CITES Convention

Export and import activities of wild plants and animals, their slopes and derivatives, as well as the import/export or re-export of species of fauna and flora regulated by the Convention on International Trade in Endangered Species of Wild Fauna and Flora – CITES. The Republic of Moldova, according to Law no. 1246-XIV of September 28, 2000, legislated the accession of the Republic of Moldova to the Convention on International Trade in Endangered Species of Wild Fauna and Flora CITES (Official Gazette of the Republic of Moldova, 2000, no. 133-136, art. 949), art. 61 of Law no. 1515-XII of 16 June 1993 on the protection of the environment and art. 19 of the Animal Kingdom Law no. 439-XIII of 27 April 1995.

Export or import activities of fauna species (**Table 11**) and flora (**Table 12**) spontaneous, terrestrial and aquatic, or of some of their slopes or products, in a live, fresh or semi-processed state, may be organized and carried out by natural or legal persons only on the basis of the environmental agreement, in accordance with the provisions of the Procedures and norms of customs, veterinary and phytosanitary control in force.

The procedures apply for the organization and conduct of export activities of:

a) medicinal, aromatic, food, fodder, tanning, dyeing and ornamental plants of wild flora, in whole or roots, rhizomes, bulbs, stems, branches, peels, flowers, leaves, fruits, seeds and buds, in a living, fresh or semi-processed state;

(b) mushrooms, ferns, mosses, lichens, mistletoe branches, natural resins and other wild plants or parts and products thereof, whether live, fresh or semi-processed;

c) leeches, snails, shells, frogs, crayfish, snakes, birds, fish and mammals, as well as other animals of wild, terrestrial and aquatic fauna, or their parts and derivatives, in their live, fresh or semi-processed state.

Table 11. List of wild species of fauna of the Republic of Moldova (vertebrates) that are included in the annexes of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) of March 3, 1973

No	Scientific name	Popular name	CITES Annex	The Red Book, 3rd ed.
	MAMMALIA - MAMMALS			
1	Canis lupus	Wolf	**II**	
2	Felis silvestris	Wild cat	**II**	+
3	Lutra lutra	Glass	**I**	+
	AVES - BIRDS			
4	Branta ruficollis	Red-breasted goose	**II**	+
5	Oxyura leucocephala	White-headed duck	**II**	+
6	Ciconia nigra	Black stork	**II**	+
7	Platalea leucorodia	Shovel	**II**	+
8	Neophron percnopterus	Hoitar	**II**	+
9	Haliaeetus albicilla	Whitetail	**I**	+
10	Eagle chrysaetos	Mountain eagle	**II**	+
11	Helica's Eagle	Eagle	**I**	+
12	Eagle clanga	Great spotted eagle	**II**	+
13	Pomarina Eagle	Small Screamer	**II**	+
14	Hieraaetus pennatus	Lesser eagle (dwarf)	**II**	+
15	Circaetus gallicus	Snake	**II**	+
16	Buteo buteo	Common mouse	**II**	
17	Buteo lagopus	Booted mouse	**II**	
18	Buteo rufinus	Big mouse	**II**	
19	Pernis apivorus	Honey buzzard	**II**	+

20	Accipiter gentilis	Northern goshawk	**II**	
21	Accipiter nisus	Hawk	**II**	
22	Milvus milvus	Red kite	**II**	+
23	Milvus migrans	Black jay	**II**	+
24	Pandion haliaetus	Fishing Luge	**II**	+
25	Circus aeruginosus	Reed Eteal	**II**	

Source: Environment Agency
https://am.gov.md/sites/default/files/document/attachments/Lista%20cu%20specii%20s%C4%83lbatice%20din%20fauna%20Republicii%20Moldova.....pdf

Table 12. List of wild species of the flora of the Republic of Moldova that are included in the annexes of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) of March 3, 1973

No.	**Scientific name**	**Popular name**	**CITES Annex**	**The Red Book, 3rd ed.**
1.	Adonis vernalis L.	Spring Arugula	**II**	
2.	Cephalanthera damasonium (Mill.) Druce	Strawberry	**II**	+
3.	Cephalanthera longifolia (L.) Fritsch	Stabbing weed	**II**	+
4.	Cephalanthera rubra (L.) Rich.	Red strawberry	**II**	+
5.	Cypripedium calceolus L.	The lady's slipper	**II**	+
6.	Dactylorhiza majalis (Reichenb.) P.F.Hunt and Summerha	Poroinic-May	**II**	+
7.	Epipactis atrorubens (Hoffm.) Besse	Redhead Squirrel	**II**	
8.	Epipactis helleborine (L.) Crantz	Broad-leaved epipactis	**II**	
9.	Epipactis palustris (L.) Crantz	Swamp	**II**	+
10.	Epipactis purpurata Smith	Purple swamp	**II**	+
11.	Galanthus nivalis L.	Snowdrop	**II**	+
12.	Galanthus plicatus M.Bieb.	Snowdrop-folded (snowdrop-plicated)	**II**	+
13.	Gymnadenia conopsea (L.) R.Br.	Hatred (Fragrant Orchid)	**II**	
14.	Liparis loeselii (L.) Rich.	Midwife	**II**	
15.	Neottia nidus-avis (L.) Rich.	Nest	**II**	
16.	Orchis militaris L.	Poroinic	**II**	
17.	Orchis purpurea Huds.	Poroinic-purple	**II**	+
18.	Orchis signifera West (synonym: Orchis mascula (L.) L.	Early purple orchid	**II**	
19.	Platanthera bifolia (L.) Rich.	Stupiniță (Little Butterfly Orchid)	**II**	

20.	Platanthera chlorantha (Cust.) Reichenb.	Greenish apiary (Orchid-Flutu	**II**	
21.	Sternbergia colchiciflora Waldst. and Kit.	Autumn snowdrop	**II**	+

Source: Environment Agency[29]

According to the information presented by the National Botanical Garden (Institute) "Alexandru Ciubotaru" USM

The Environment Agency is the authority responsible for issuing permissive acts related to the import and export of wild species. In recent years, there has been a slow increase in the number of permissive acts issued, according to **Table 13**.

Table 13. Number of permissive environmental documents issued by the Environment Agency, years 2019-2023

No.	**Type of permissive act**	**Number of documents issued**				
		2019	**2020**	**2021**	**2022**	**2023**
1.	Authorisation for the collection of spontaneous plants, including natural medicinal plants	28	27	30	40	50
2.	Authorisation for the acquisition of animals, which are not objects of hunting and fishing (snails, frogs, lizards, snakes)	0	1	0	1	0
3.	CITES (Convention on International Trade in Endangered Species of Wild Fauna and Flora) permit/certificate	107	93	119	89	107
4.	Agreement for the export of plants	61	66	95	52	46
5.	Agreement for the export of wild animals	3	3	1	1	0
6.	Agreement for the import of wild animals and/or plants	54	47	55	15	1/0

Source: *Annual Activity Reports of the Environment Agency, 2019-2023*

Spontaneous plant species that are cultivated for commercial purposes for export, as well as wild animals that are bred in captivity for commercial purposes for export, are also subject to the provisions of Law no. 1246-XIV of September 28, 2000 for the accession of the Republic of Moldova to the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES).

In order to ensure a better management of trade in CITES species, it is necessary to develop procedures for authorizing export/import activities of CITES species of flora and fauna, as well as to create an effective monitoring system for

[29] https://am.gov.md/sites/default/files/document/attachments/Lista%20speciilor%20de%20plante%20CITES%20din%20Moldova%20....pdf

international trade in endangered species of wild fauna and flora. At the same time, it is considered necessary to create a mechanism to prevent and combat illicit trade in wild animals (including derived products, parts thereof) that have been poached or trafficked by smuggling.

Needs and actions

MD5 target. The harvesting, use and trade of wildlife species is sustainable, safe and in accordance with the provisions of national legislation and the CITES Convention

- Elaboration of procedures for authorizing export/import activities of CITES species of flora and fauna.
- Creating an effective monitoring system for international trade in endangered wildlife species
- Create a mechanism to prevent and combat illicit trade in wild animals (including derived products, parts thereof) that have been poached or trafficked through smuggling

Section 9. Aquaculture and fisheries

The surface water resources in the Republic of Moldova are represented by 6500 permanent or intermittent watercourses with a total length of about 27000 km, including the large rivers: Dniester (652 km), Prut (705 km), Răut (286 km), which are located in the Dniester River Basin District and the Danube, Prut and Black Sea River Basin District.

The most important surface water resources (72% of the available resources or 9,000 million m3/year) are the transboundary rivers Dniester and Prut, which are jointly managed with Ukraine and Romania on the basis of interstate agreements.

The volume of surface waters, which can potentially be concentrated in the interior of the country in more than 3500 reservoirs, constitutes about 1,320 million m3.

The water resources of the Dniester River and r. In dry years, due to the regularization of the runoff at the Novodnestrovsk, Dubasari and Stanca-Costesti hydrotechnical nodes, they can ensure a sufficient flow to maintain ecosystems. In the spring period, within the Interdepartmental Commission attached to the Water Resources Agency of Ukraine, with the participation of representatives of the relevant

institutions of the Republic of Moldova, the terms and volumes of ecological floods during the fish reproduction period are established.

It should be noted that the water resources of internal rivers are not sufficient and sustainable, and in periods of drought some small rivers practically dry up.

In order to regulate the runoff and the accumulation of surface waters, over 3500 reservoirs/ponds have been built on the territory of the country with a total surface of the water mirror of about 48 thousand ha. Most of the water reservoirs were built by damming the rivers in the 1950s and 1970s of the twentieth century. However, as a result of the clogging processes, the volume of the reservoir pools/ponds during the exploitation period decreased considerably, a large number of them being dried up.

Danube, Prut and Black Sea River Basin District

The total area of the Danube-Prut and Black Sea river basin district within the borders of the Republic of Moldova is 14,770 km2, which represents 43.6% of the country's surface, and which extends over the perimeter of 18 administrative districts.

In the meadow of r. There are natural lakes, which in size are small lakes, having a shallow depth and are often covered with swamp or hydrophyte vegetation. Only two of these lakes have an area of more than 2 km2. In the Danube and Black Sea hydrographic basin, only a small sector of the northern part of Cahul Lake administratively belongs to the Republic of Moldova, which is occupied by hydrophytic vegetation. The characteristics of the meadow lakes (surface, depth, hydrological regime, etc.) are largely determined by the regime of the Lower Prut and the Danube. The largest lake in the Prut meadow is Beleu Lake, which is located in the lower course of the Prut, between s. Văleni and Slobozia Mare in Cahul district.

The accumulations of water of anthropogenic origin were created to meet various economic needs (irrigation, electricity production, fishing, leisure, etc.), as well as to regulate the flow of the river and control floods. Approximately 1350 water accumulations are located in the basin r. Prut, with a total area of 75.3 km2. In the Danube and Black Sea basin, 1452 water accumulations were identified, of which 5 reservoirs with an area of more than 1 km2 (Taraclia, Congaz, Comrat, Caplani, Ucrainca), 11 lakes with an area of 0.5-0.99 km2, 11 lakes with an area of 0.25-0.49 km2 and 1425 lakes with an area of less than 0.25 km2. The water of many lakes is characterized by a high degree of mineralization (2.0-5.0 g/l).

Dniester River Basin District (DRBD)

The area of the Dniester basin (within the limits of the Republic of Moldova) is 19232.79 km². The basin is distributed asymmetrically with respect to the main axis of the Dniester valley, so that the left area of the basin (within the limits of the Republic of Moldova) is 3514.79 km² (18.27%), and the right one, 15718.0 km² (81.73%).

The hydrographic network of the DRBD is represented by about 3000 surface watercourses, of which 1591 rivers, including 5 with a length of about 100 km and another 153 rivers with a length of about 10 km, 51 reservoirs with a volume of about 1 million. m3 each and about 1700 small water accumulations. The longest rivers in the DRBD are the Răut, Bâc and Botna.

The largest natural lakes in DRBD are Sălaș (3.72 km2), Roșu (1.6 km2) and Dniester Vechi (1.86 km2). The largest artificial lakes are Dubasari on the Dniester River (67.5 km2) and Ghidighici on the Bac River (6.8 km2). The network of lakes ensures regularization and responds to recreational requests, being also used for the supply of drinking and technical water, for irrigation, navigation and other purposes.

Fishing

The assessment of ichthyofauna diversity in the aquatic ecosystems of the Republic of Moldova denotes fluctuating values of non-uniform character, in different years being cataloged between 75 and 130 taxa. This alternation of ichthyofauna diversity is conditioned, on the one hand, by the difficulty and specificity of ichthyofauna monitoring, and on the other hand, by large-scale activities regarding the translocation of new species, and by the self-expansion of exotic representatives and interveners in anthropogenically modified environments.

Until the beginning of the nineteenth century, the ichthyofauna of the Dniester was represented in a proportion of more than 70% of the lithophilic species of fish, which largely reflected the nature of the bed's substrate (stony-sandy), and starting with the twentieth century, the integrity of the biotopes and the structural-functional state of the ichthyocenoses was seriously disturbed. The damming and damming of riverbeds, the construction of hydroelectric power plants, the sanitation of ponds and natural lakes, the construction of communication channels between various hydrographic basins, the extraction of stone and sand from riverbeds, the development of irrigation infrastructure, the modernization of commercial and illicit fishing methods, the translocation of allogeneic fish material, the intensification of technogenic pollution, and last but not least, rapid climate change has led to irreversible changes in the structure of the and the state of the native fish fauna. Currently, fish catches show a dramatic decline. The indigenous species of medium and large size, numerous in the past, among which we mention the king fish, such as sturgeons (*sturgeon, Russian sturgeon, visa, sturgeon, stork),* salmonids (*sea trout, lostrita, indigenous trout*), European eel have practically disappeared. Also, species that were very abundant in the past, such as *the swordfish, the semi-migratory stingray, the common barbel, the chub, the scobar, the ocheana,* have now become much rarer, and their place has been taken by the opportunistic species of small and medium size, such as: *guvizii, undreaua, ghidrin, silver carp, batca, babuşca, perch, obleț* and by those of culture systematically populated, such as: *carp, blood, novacul, the chimney (***Figure 5**).

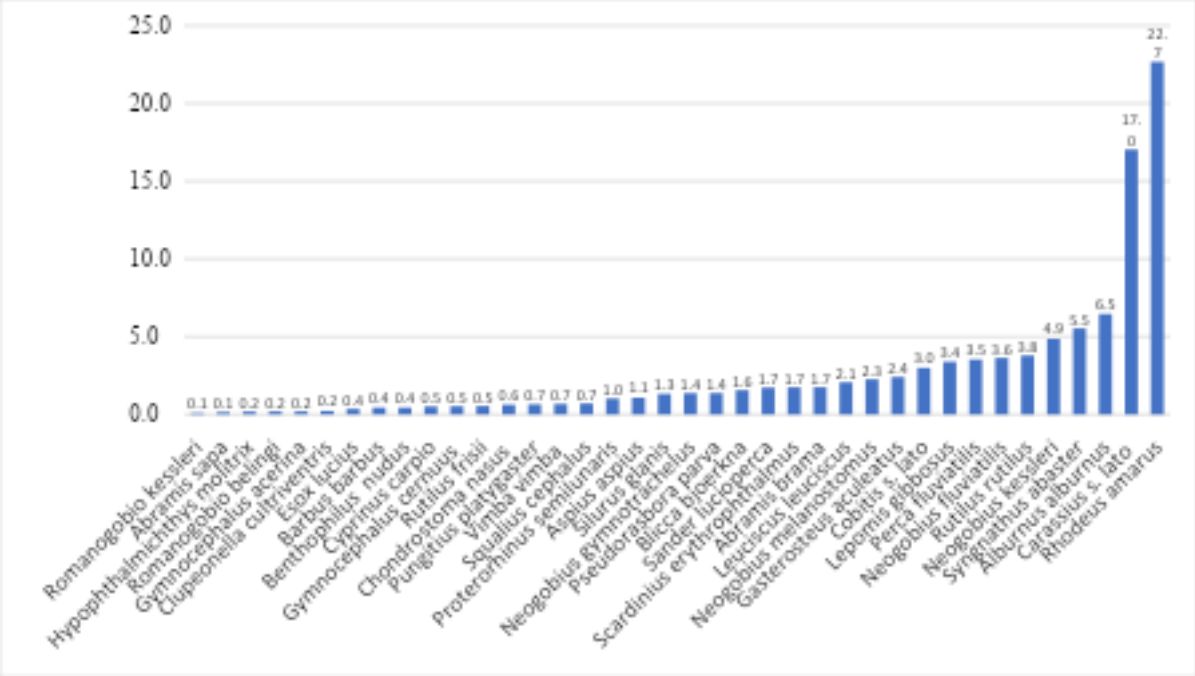

Figure 5. Dominance value (D%) of fish species from the Lower Dniester for 2017-2019 (fishing gear: brood net)[30]

Many other native species, once characteristic and emblematic of natural waters, have now reached numerical decline or even disappeared: *octopus, flax, eel, European carp (wild form), swordfish, shearwater, stork, sword, swine, swine, etc*.

The keystone, emblematic, endemic, invasive fish species with national rarity status from the basins of the Dniester River and r. Prut are presented in **Table 14**.

Table 14. List of keystone, emblematic and endemic species of fish and cyclostomes in the natural aquatic ecosystems of the Republic of Moldova[31]

No	Keystone species	Emblematic species	Species included in the Red Book of the Republic of Moldova (3rd ed., 2015)	Endemic species of the Danube or Dniester basin	Invasive alien species
1	*The Obleț̦ul*	*Cod*	*Chishkar-Ukrainian*	*The Gypsy*	*Silver carp*
2	*Silver carp*	*The Sniester*	*Sniester*	*Fusarul*	*The Sisters*
3	*Perch*	*Sturgeon*	*Blind*	*The Stonemason*	*The Ponded Murgoi*

[30] http://www.cnaa.md/files/theses/2019/55482/dumitru_bulat_abstract.pdf

[31] https://zoology.md/sites/default/files/2022-08/Bulat%20D_Ihtiofauna%20Republicii%20Moldova_2017_DOI.pdf

4	*Babușca*	*Blind*	*Sturgeon*	*The Danube Ghiborțul*	*Santa Claus*
5	*The zander*	*The Pontic Babusha*	*Sturgeon*	*The Danube*	*Sângerul (Prut district)*
6	*Bream*	*The Sword*	*Gypsy*	*Lostrița*	
7	*The Elder*	*Linen*	*Lostriţă*	*Râmbița*	
8	*Sleep*	*Morunașul*	*Eel - European*	*The Scrap*	
9	*Pike*	*The eel*	*Common Beldiţă*	*The Flyer*	
10	*Batca*	*European carp*	*Eggplant barbel*	*The Danube Whirlwind*	
11		*Caracuda*	*Octopus*	*European carp*	
12		*European catfish*	*Widow*	*Eggplant barbel*	
13			*Sabiţă*	*The Danube Babușca*	
14			*Mihalţ*	*Sledgehog*	
15			*Caspiosoma*	*Sand pig*	
16			*Cnipovicia-with-*		
17			*long tail*		
18			*Grain*		
19			*Striped zander*		
20			*Fuse*		
21			*Stonemason*		
22			*Eastern Raspberry*		
23			*Varezubul (Pontic Babușca)*		
24			*Chernusca*		

The investigations carried out in the **Dniester River** basin during 2006-2019 revealed 76 taxa belonging to 11 orders and 18 families: *Petromyzontidae* (1 sp.), *Acipenseridae* (2 sp.), *Esocidae* (1 sp.), *Cyprinidae* (35 sp.), *Gobiidae* (10 sp.), *Cobitidae* (7 sp.), *Balitoridae* (1 sp.), *Percidae* (6 sp.), *Clupeidae* (3 sp.), *Gasterosteidae* (2 sp.), *Siluridae* (1 sp.), *Lotidae* (1 sp.), *Sygnathidae* (1 sp.), *Atherinidae* (1 sp.), *Centrarchidae* (1 sp.), *Odontobutidae* (1 sp.), *Cottidae* (1 sp.), *Umbridae* (1 sp.). Out of the number of identified species, 14 species of fish are included in the Red Book of the Republic of Moldova (3rd edition), 22 species can be assigned to the group of fish species with economic potential, and 24 taxa can be found in the group of alien and intervening species (**Figure 6**).

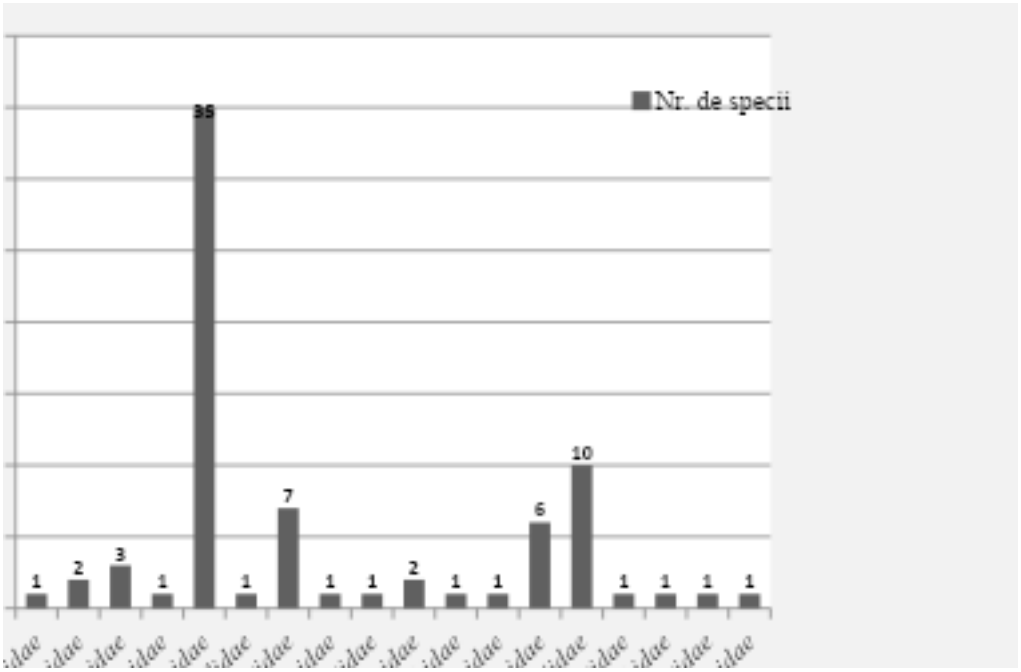

Figure 6. Composition of the Dniester river in 2005-2019 (territorial limits of the Republic of Moldova)[32]

The investigations carried out **in the Prut river basin** during 2010-2019 revealed an ichthyofauna diversity consisting of 59 species of fish, assigned to 11 orders and 16 families: *Ord. Petromyzontiformes, family Petromyzontidae* (1 sp.); *Ord. Acipenseriformes, fam. Acipenseridae* (2 sp.); *Ord. Salmoniformes, Fam. Salmonidae* (1 sp.), *Ord. Clupeiformes, fam. Clupeidae* (1 sp.); *Ord. Esociformes, fam. Esocidae* (1 sp.); *Ord. Cypriniformes, fam. Cyprinidae* (28 sp.)*, fam. Balitoridae* (1 sp.), *fam. Cobitidae* (6 sp.)*; Ord. Siluriformes, fam. Siluridae* (1 sp.); *Ord. Gadiformes, fam. Lotidae* (1 sp.); *Ord. Gasterosteiformes, fam. Gasterosteidae* (2 sp.); *Ord. Sygnathiformes, fam. Sygnathidae* (1 sp.); *Ord. Perciformes, fam. Percidae* (6 sp.), *fam. Gobiidae* (5 sp.), *fam. Centrarchidae* (1 sp.), *fam. Odontobutidae* (1 sp.)*tag.* Out of the number of identified species, 12 fish species are included in the Red Book of the Republic of Moldova (3rd edition), 19 species can be attributed to the group of fish species with economic potential, and 17 taxa can be attributed to the group of alien and intervening species (**Figure 7**).

[32] *http://www.cnaa.md/files/theses/2019/55482/dumitru_bulat_abstract.pdf*

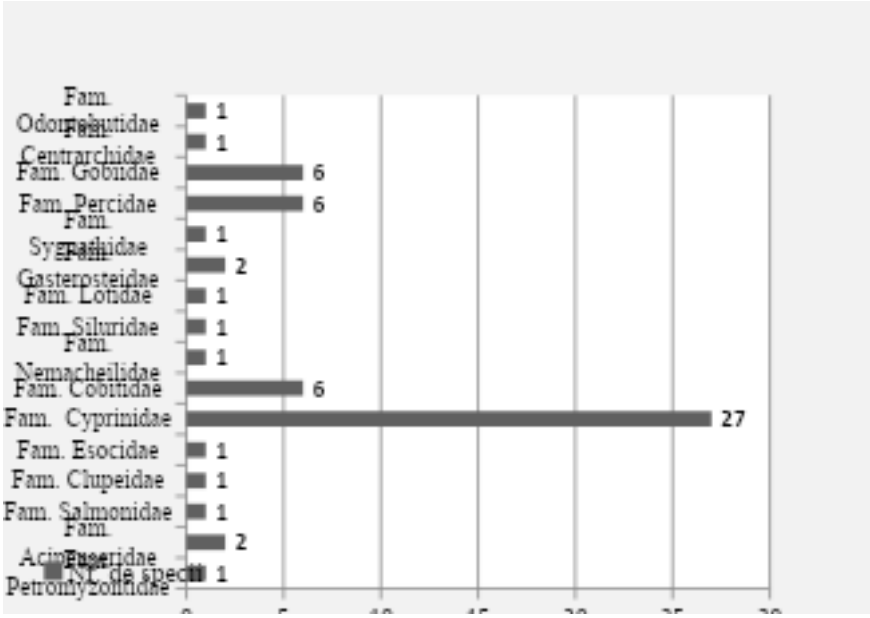

Figure 7. Composition of the ichthyofauna of the Prut River (within the limits of the Republic of Moldova), ay. 2010-2019[33]

Thus, at the basin level (within the limits of the Republic of Moldova), 59 species of fish were identified, in the ecosystem of Lake Beleu – 45 species, in the Manta ponds – 39 species, in the Costești-Stânca area – 32 species of fish **(Figure 8).**

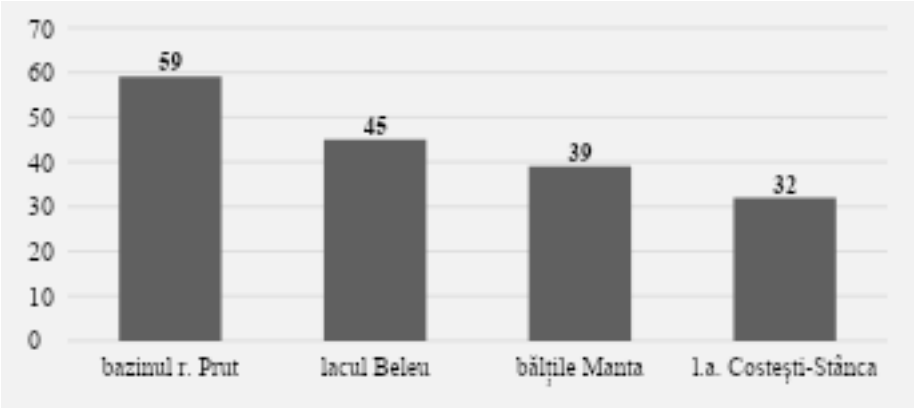

Figure 8. The composition of the ichthyofauna of the main aquatic ecosystems in the basin r. Prut (within the territorial limits of the Republic of Moldova, ay. 2010-2019) [34]

[33] http://www.cnaa.md/files/theses/2019/55482/dumitru_bulat_abstract.pdf

[34] http://www.cnaa.md/files/theses/2019/55482/dumitru_bulat_abstract.pdf

The richest ichthyofauna was found in the lower courses of the Dniester River and the Prut River, thanks to the ecotone zone. In the upstream direction, the share of rheophilic fish species increases, but the value of specific diversity and fish biomass decreases.

Currently, most of the small rivers in the country are intensely polluted and transformed into a series of cascading water accumulations, often causing the periodic drying up of the riverbed sectors. As a result, the hydrological, hydrochemical, thermal and hydrobiological regime was strongly affected. Despite the worsening of the ecological status of small rivers in the country in recent decades, their ichthyofauna diversity has undergone changes in the direction of increasing the number of species, due to the anthropochoral penetration or self-expansion of allogeneic and intervening taxa (**Figure 9 and Figure 10).** At the same time, there have been profound changes in the state of native species communities, degrading the ecological guilds of rheophilic, oxyphilic, umbrophilous and cryophilic fish species.

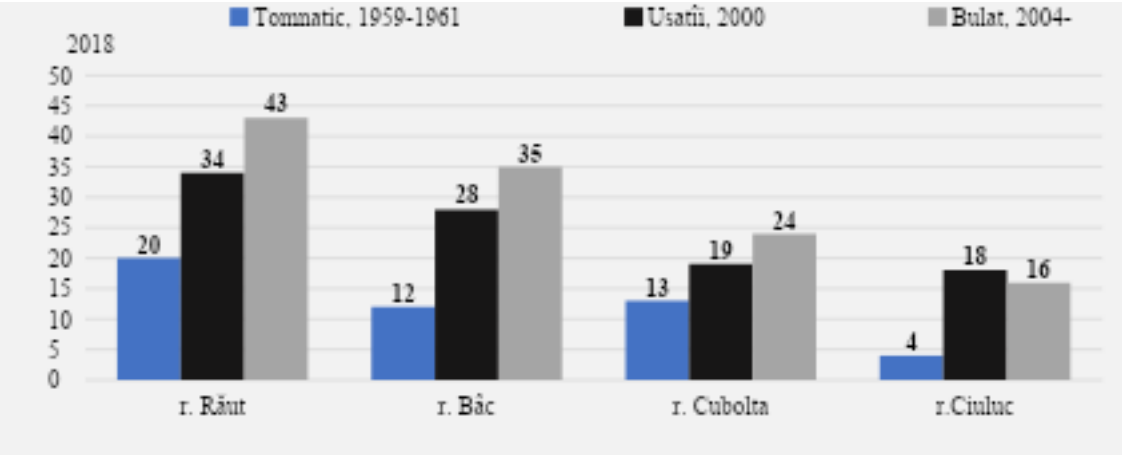

Figure 9. Dynamics of ichthyofauna diversity of some tributaries of the Dniester river

in temporal aspect[35]

The results of ichthyofauna investigations in the small rivers of the Republic of Moldova from the inheritance aspect find the greatest diversity in the r. Răut − 43 species, then r. Bac – with 35 species of fish. Among the tributaries of r. Prut that

[35] *https://zoology.md/sites/default/files/2022-08/Bulat%20D_Ihtiofauna%20Republicii%20Moldova_2017_DOI.pdf*

have been investigated, the highest value of diversity belongs to r. Ciuhur – 23 species, then r. Răcovăț – with 21 species of fish.

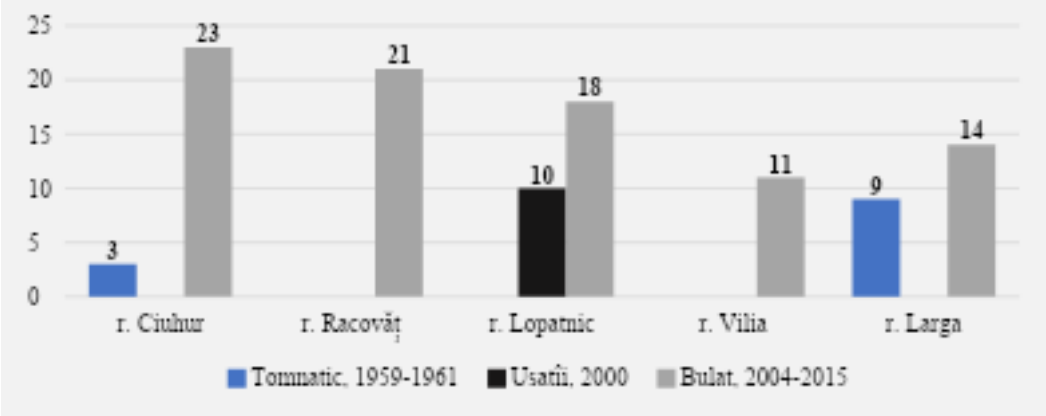

Figure 10. Dynamics of ichthyofauna diversity of some tributaries of the Prut River in temporal aspect[36]

Fishing and fish farming activities are regulated by Law no. 149/2006 on the fishing fund, fisheries and fish farming, amended and supplemented by Law No. 7/2018.

Sport, amateur and recreational fishing in natural aquatic fishing objectives is carried out on the basis of permits issued by the Environment Agency. (**Table 15).**

Table 15: Number of sport, amateur and agreement fishing permits, 2019 – 2023

The information system used	Type of permissive act	Number of documents issued				
		2019	2020	2021	2022	2023
"e-Fishing" Information System	Sport, amateur and recreational fishing license	23707	31832	30744	34456	40640

Source: Environment Agency

Aquaculture

In the case of the Republic of Moldova, aquaculture is a component part of the framework of the socio-economic and environmental holistic system, it has an

[36] https://zoology.md/sites/default/files/2022-08/Bulat%20D_Ihtiofauna%20Republicii%20Moldova_2017_DOI.pdf

essential role in the management of water resources and a significant impact on natural resources and agricultural land management. The sector is an activity that generates opportunities for the development of the local economy (jobs in rural areas, valorization of poorly productive land, irrigation), as well as environmental benefits or services (biodiversity, microclimate, maintenance of surface and soil water levels, etc.).

Fish production in the Republic of Moldova, as in most Central and Eastern European countries, is primarily aimed at satisfying the requirements of the domestic market. The amount of domestic fish increased by 7.1 times – compared to 2000; 1.5 times – in the last 10 years, reaching a production volume of about 13 thousand tons.

From a technological point of view, fish farming in the Republic of Moldova is characterized by two main directions: extensive and semi-intensive breeding of cyprinids in polyculture, ponds and ponds. The average fish productivity in ponds of food fish is 700 kg/ha; Under the conditions of introducing the appropriate technologies and using the quality material at the stock, up to 3,000 kg/ha can be obtained.

The national aquaculture production sector is provided by more than a thousand fish farms, which produce stock and fish for consumption, 8 fish nurseries operate for natural-directed and artificial breeding and breeding of fish stock, 7 breeding complexes with incubators for artificial breeding. Employment in this sector exceeds about 4 thousand employees.

The main species of traditional aquaculture cultivated in the lakes, ponds and ponds of the Republic of Moldova in extensive and semi-intensive conditions are: carp (*Cyprinus carpio*), bloodhound (*Hypophthalmichthis molitrix*), novac (*Hypophthalmichthis nobilis*), moth (*Ctenopharyngodon idella*) and silver carp (*Carassius gibelio*). An insignificant share represents the production of zander (*Sander lucioperca*), pike (*Esox lucius*), European catfish (*Silurus glanis*), crayfish (*Astacus leptodactylus*). In super-intensive growing conditions (using recirculating aquatic systems (SAR), floating ponds, flow through system) sturgeons and their hybrids, rainbow trout, African catfish, carp breeds are mainly cultivated.

The volume of fish caught in the country's water basins does not exceed 30% of the total fish production. Natural water basins are the source and reserve of fish genetic diversity, which can be used both in artificial reproduction and in the restoration of commercial species, as well as for expanding the range of products on the market and for cushioning the pressure of fishing on natural populations.

Impact factors

Among the factors with an impact on ichthyofauna in natural aquatic ecosystems we mention:

- ***Fragmentation of rivers and various obstacles in the movement of fish***. The effects of the construction of the Dubasari (1956) and Novodnistrovsk (1981) reservoirs on the Dniester River, the Costesti-Stanca (1978) reservoir on the Prut

River. As a result of these hydrotechnical works, the speed of water drainage has decreased, significantly accelerating the negative processes of silting and "muddling" of the riverbed sectors. The operation of hydrotechnical nodes causes sudden and frequent drops in the water level, which causes the mass destruction of embryonic eggs left on land. The most disastrous effect is found in species with a unitary mode of reproduction, in which the entire generation of a year can be compromised (most of the economically valuable large species belong to this group).

Also, a significant impact of the operation of the Novodnistrovsk hydrotechnical complex on the ichthyofauna fl. The Dniester consists of the disruption of biological cycles in fish (nutrition, reproduction, wintering) due to the change in the natural thermal regime. Analyzing the multiannual sequences of the thermal regime, a decrease in water temperature in the spring-summer period by 5-80C was noted, compared to the natural temperature, which is felt up to the Dubasari dam, causing the inverse dependence between the volume of water discharged from Lake Novodnistrovsk and the water temperature over a distance of up to 400 km downstream. In winter, the water temperature is 5-60C higher.

- ***Anthropogenic pollution*.** The main sources of penetration of ecotoxicants into the Dniester and Prut river basins are domestic and street activities (liquid and solid communal residues), the agro-livestock sector (herbicides, insecticides, fungicides, mineral and organic fertilizers, etc.), the production industry (plastics, synthetic dyes, etc.), pollution with special residues from the pharmaceutical sphere (antibiotics, hormonal preparations, contraceptives, endocrine disruptors, etc.).
- ***Unregulated and illegal fishing*.**
- ***Biological pollution with foreign species.*** Among the most significant negative consequences caused by invasive fish species on the structural-functional state of the autochthonous ichthyocenoses, there are: impoverishment of the natural trophic base, active predatory (larvae, brood and eggs), parasitic vectors, genetic pollution through hybridization, compromise of access to cattle of native fish species, etc. According to the FISK (Fish Invasiveness Screening Kit) protocol, the following invasive fish species have the greatest potential for biocontamination in the conditions of the Republic of Moldova: *silver carp*, *old man, sour* and *marsh murgoi*. From the group of fish species, the most dangerous for the structural-functional state of the local ichthyocenoses are considered the following: *the undreau*, *the shepherd*, *the ghidrin*, *the stranglel*, *the ossar*, *the mocănaș*, *the moaca-de-fir*, *the marsh guvid, the small-pontic terina*, the *gingirica*tag.
- ***Destruction of wetlands and damming of banks*.** Flood zones and flowing waters are two interdependent systems with beneficial effects for both parties. Flood zones provide food, shelter, reproduction, growth and development of many living things, while flowing waters constitute, for flood zones, a source of mineral and biogenic elements that lead to plant and animal rebirth.

- ***The trend of global warming and natural hazards.*** With the increase in the instability of climatic conditions, the diversity of fish species in natural ecosystems can both decrease due to the elimination of biosensitive and "too conservative" ones, and increase, based on the self-expansion of opportunistic exotic species of southern origin translocated to anthropohors (especially those from aquariums and those from super-intensive farming systems), of the Pontus-Caspian and Mediterranean relics. The intensification of torrential rains often causes large amounts of pollutants to wash away from adjacent areas (pesticides, fertilizers, household and industrial waste stored nearby, etc.), significantly increasing the risks of mass destruction of fish due to hypoxia (especially at night, significant amounts of oxygen are consumed by algae developed in excess – a phenomenon called "water blooming") or as a result of the toxic effect (direct or indirect).
- ***Destruction of the forest strips along the riverbeds*** that naturally ensure the well-being of these rivers and serve as indispensable habitat elements for rheophil-umbrophilous species: species *of piglets*, *lipan, native trout*, *grindel, boișteanul* etc. The direct correlation between the degree of afforestation of the banks and the well-being of the ichthyofauna is demonstrated on the basis of small rivers, subject to the active phenomenon of deforestation in recent decades. The valorization of the neighboring lands for agricultural purposes has as a serious consequence the erosion of the fertile soil, the acceleration of secondary pollution processes (fertilizers, pesticides) and the silting of the aquatic objectives in the vicinity.
- ***Destruction of the breeding sites*** of lithophilic fish species **by extracting stone, sand and pebble** from the Dniester and Prut riverbeds. A detrimental impact on the conditions of reproduction, development and fattening of ichthyofauna in the Dniester River was also produced by the works of deepening the riverbed and the excavation of pebble and sand, works that started at the end of the 50s of the twentieth century, excavating annually about 2.8 million m3 of sand and pebbles from the minor riverbed. By carrying out these works, the natural habitats of fl. Dniester river, causing significant damage to ichthyofauna and complete degradation of benthic communities not only in the excavation sites but also downstream, over a distance of about 800-1000 m at the same time, negatively influencing the trophic base and significantly reducing the areas of the woods for limno-rheophilic species.
- ***Irreversible use of water.*** In the conditions of long-term droughts, water is increasingly used by pumping water from surface or underground sources. Most pumping stations that use water from lakes and rivers operate without special fish protection facilities, and the trend of vertiginous development of intensive agriculture will require even more abundant irrigation in the future.

Needs and actions

MD Target 10: Sustainable management of agricultural areas, aquaculture, fisheries and forestry

- Elaboration of the legal framework regarding regulations in the field of fisheries and aquaculture;
- Ensuring the proper management of the fisheries, fisheries and fish farming fund in order to implement the provisions of the Law on the Fish Fund, Fisheries and Fish Farming no. 149/2006.

Section 10. Invasive alien species

Invasive alien species are one of the five major direct drivers of biodiversity loss globally, along with land and sea use change, direct exploitation of organisms, climate change and pollution. The new ambitious global target on invasive alien species is stipulated by Target 6 of the Kunming-Montreal Global Biodiversity Framework, which aims to reduce the introduction and establishment of invasive alien species by at least 50% by 2030.

Invasive species are a global threat and are one of the major causes of biodiversity loss. According to recent reports by the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) in 2023, invasive species are one of the five major causes of biodiversity loss both locally and globally, accounting for 60% of the disappearance of plants and animals globally.

Invasive Alien Species (IAS) in Moldova represent an important challenge for biodiversity conservation. The invasion of synanthropic species in degraded natural ecosystems hinders the restoration processes of natural biocenoses and affects their functionality. The presence of free ecological niches and the absence of rivals or predators create preconditions for the emergence of invasive alien (alien) species and the numerical increase of some native species, which through their excessive development can become invasive. The unsustainable management of natural ecosystems has led to their fragmentation, to a considerable reduction in the number but also to the disappearance of some species.

Currently, invasive alien species represent a major ecological problem and a serious threat to the management of the country's natural biological resources, which have a significant economic impact. Some alien species are introduced for commercial, ornamental, aesthetic or biological control purposes, while others are introduced unintentionally (contaminants, illegal trade). Some alien species are widely used in forestry, for example acacia (*Robinia pseudoacacia*) and in private

households. Others pose a threat to domestic biodiversity by polluting genetic resources, replacing valuable species, thereby causing considerable damage to the national economy (pests in agriculture and forestry). The recent invasion of weeds - ragweed *(Ambrosia artimisiifolia)* in Moldova is an example that has an economic impact on agriculture, forestry and also on human health, causing serious allergic reactions.

There are a significant number of invasive alien species of plants and animals present in Moldova, estimated at **114 species of plants and 149 species of animals**. The specific composition of the species of animals with invasive potential was identified as well as their ecological, economic and social impact described. The list of invasive animal species includes the total number of 149 species (mammals – 12 sp., birds – 2 sp., reptiles – 3 sp., fish – 4 sp., mollusks – 6 sp., crustaceans – 1 sp., hematophagous arthropods – 11sp., insects – 1sp., cestodes – 6 sp., nematodes – 36 sp.). Invasive fauna species are Cervus *nippon, Dama dama, Nyctereutes procyonoides, Canis aureus, Ondatra zibethica, Phasianus colchicus, Ctenopharyngodon idella, Mylopharyngodon piceus, Hypophthalmichthys molitrix, Aristichthys nobilis and Ictalurus punctatus*. About 130 species of invasive animal species damage agricultural crops, and 15 species damage forests.

Many species of foreign animals were deliberately introduced into Moldova. Since the 1950s, several species have acclimatized, including the raccoon dog *(Nyctereutes procyonoides),* the muskrat *(Ondatra zibethicus),* the sika deer (*Cervus nippon),* and the pheasant *(Phasianus colchicus)*. Several invasive species, such as the Colorado beetle, phylloxera, etc., have been introduced unintentionally. Others spread naturally, namely, the golden jackal *(Canis aureus),* the ring-necked pigeon (*Streptopelia capicola),* the black woodpecker *(Dryocopus martius*), and the Syrian woodpecker *(Dendrocopus syriacus*). The species of invasive anthropogenic animals are the following: common rat *(Microtus arvalis*), Norwegian brown rat *(Rattus norvegicus*), house mouse (*Mus musculus*), as well as several dozen species of insects – the main pests of agricultural and forestry crops. Invasive alien species of insects are the Colorado beetle (*Leptinotarsa decemlineata*), the autumn worm *(Hyphantria cunea*), the Mediterranean fruit fly (*Ceratitis capitata*), the San-Jose scale *(Quadraspidiotus perniciosus*).

Many of the invasive species have naturalized in the Republic of Moldova, becoming part of artificial and partially natural phytocenoses, and are still spreading, for example, *Grindelia squarrosa, Ambrosia artimisiifolia, Xanthium albinum, Abutilon theophrasti, Mirabilis nyctaginea*. Most of the adventitious species are of American origin and have found favorable conditions for development in Moldova.

Ambrosia aremisiifolia and *Acer negundo* pose a considerable danger to agricultural and forest ecosystems.

Aggressive weeds constitute 11 quarantine species (*Arceuthobium spp., Acroptilon repens D.C., Ambrosia psilostachia D.C., etc.*). The representatives of these species mostly damage the natural ecosystems of pastures and agricultural ecosystems.

In the last 20 years, 23 new species of invasive insects have been reported in the Republic of Moldova, 22 of which are harmful and one useful. The reported alien insect species belong to 7 orders, 15 families and 21 genera. Most of the invasive insect species were recorded from the order *Lepidoptera* (8 species), followed by the order *Hemiptera* (5) and *Coleoptera* (4). From the orders *Hymenoptera* and *Heteroptera*, only 2 species were recorded, and the orders *Orthoptera* and *Diptera* were represented by one species each. Most of the newly registered invasive insect species on the territory of the Republic of Moldova reimpose strict monitoring systems, in order to avoid negative effects on forest and agricultural ecosystems or agri-food deposits. 25 species of new invasive insect species (pests) have been registered as invasive in the Republic of Moldova and have been shown to be dangerous for native flora and urban green spaces, including: black elm wasp (*Aproceros leucopoda*), chestnut miner *(Cameraria ohridella),* oak tiger *(Corythucha arcuata),* and others.

Invasive alien bird species on the territory of Moldova, occupying a wide geographical position, pass the transcontinental migration routes of wild birds, which connect territories, stretching from Finland to the Ural Mountains in the north and from South Africa to West Asia in the south. The migration of birds through the territory of Moldova takes place both on a wide front and along directed lines. Of the 280 species of birds registered in Moldova, about 190 species pass through its territory during spring and autumn migration; they represent almost all taxonomic orders of birds, but most are representatives of the orders *Passeriformes* (38%), *Anseriformes* (15%), *Charadriiformes* (14%). According to the research investigations, during their spring migration in the wetlands of the Lower Prut, 75 species were identified, of which the most abundant species are the aquatic ones: mallard - *Anas plathyrhynchos* (6500 specimens), lychee - *Fulica atra* (2500), chestnut-headed duck - *Aythya ferina* (1800), variegated duck - *Anas strepera* (1700), mallard - *Anas acuta* (750).

A high degree of danger for the aquatic ecosystems of the Republic of Moldova is represented by the naturalized alien fish species: the marsh murgoi (*Pseudorasbora parva),* the perch *(Perca fluviatilis),* the silver carp *(Carrassius gibelio)* and the amur

(Gobius cephalarges). The silver carp is native to the Amur basin, currently it is a cosmopolitan species. The successful naturalization of silver carp in water basins throughout Europe serves as proof of its broad ecological valence and important adaptive potential. Lepomis *gibbosus Linnaeus, 1758,* native to North America, the upper basin of the Mississippi River, is a naturalized species of fish. The extremely high abundance of this species has caused major consequences on the population status of other native fish species, such as line, perch, sea bream, etc.

Many alien species are actively used in economic activities (for food or energy). Sectors of the national economy, such as agriculture, forestry and fish farming, use the benefits offered by some invasive alien species. Globalization, economic relations, export/import activities of agricultural goods and products, tourism and migration, climate change and global warming favor the penetrations of new species, which may have the potential for invasiveness.

It should be noted that the current legal framework in the field of biodiversity does not sufficiently regulate activities related to invasive alien species and does not ensure preventive measures or combat their impact on biodiversity and natural ecosystems to the necessary extent, according to international and EU requirements. At present, there are insufficient legal and administrative measures for adequate management to ensure biosecurity. The phytosanitary control system ensures only plant protection measures in agriculture.

GBFKM-2030 stipulates the need to ensure measures to eliminate, minimize, reduce and/or mitigate the impact of invasive alien species on biodiversity and ecosystem services, the global target being to reduce the impact produced by invasive alien species on biodiversity loss by at least 50% by 2030 and the eradication or control of invasive alien species.

It is necessary to improve the legislative framework on invasive species and to develop institutional capacities that will ensure mechanisms for early detection, monitoring, risk assessment, control, prevention and eradication/control of invasive species, in accordance with international and regional rules and in order to reduce their impact on biodiversity.

Needs and actions

MD target 6. Management of invasive alien species

- Developing regulations to eliminate, minimise, reduce and/or mitigate the impact of invasive alien species on biodiversity and ecosystem services, in line with the EU legal framework
- Identification of invasive alien species with major impact on biodiversity and elaboration of the National List of Invasive Alien Species.

- Developing the mechanism for limiting, controlling and eradicating invasive alien species, including emergency measures.
- Establishing the procedures for assessing the risk of invasive alien species in order to identify and prioritize their management options.
- Establishing a procedure for authorising the introduction, transport and placing on the market offered, reared or released into the environment of pronounced invasive alien species, in line with EU requirements
- Ensuring administrative mechanisms for monitoring invasive species introduced for economic purposes, including the database with information on the associated risk.

Section 11. Genetic resources and equitable benefit-sharing

The Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Resulting from Their Use to the Convention on Biological Diversity, ratified by the Republic of Moldova through Law no. 117/2016, implements the third objective of the CBD Convention on Access and Benefit-sharing (ABS), and which proposes to the Parties to the Convention "*taking effective legal, political, administrative and capacity-building measures at all levels to ensure the equitable sharing of benefits arising from the use of genetic resources and digital sequence information on genetic resources, traditional knowledge associated with genetic resources, as well as facilitating adequate access to genetic resources*'.

The Nagoya Protocol is extremely important to ensure the conservation and sustainable use of biodiversity in Moldova. The Protocol provides an important basis for greater legal certainty and transparency for both providers and users of genetic resources, while promoting benefit-sharing. According to the provisions of the Protocol, each country has the sovereign right to its national genetic resources and assumes responsibility for regulating access to genetic resources through the issuance of authorizations.

The Protocol also provides for the establishment of a **check-point/agreement mechanism on the fair and equitable sharing of benefits** arising from the use of traditional knowledge associated with genetic resources and lays down binding rules on monitoring the use of genetic resources once they leave the provider country.

Genetic biodiversity.

The flora of the Republic of Moldova comprises 5,568 species of plants (of which 2,044 species of higher plants and 3,524 species of lower plants), with a number of Tertiary and Quaternary relict species, while a few very rare species constitute the sub-endemic element. There are 1,842 species of vascular plants and

about 4,600 species of lower plants and fungi, including 13 relict genera, 126 species included in the Red Book, and 4 species at the limit of their natural distribution. The diversity of plant species is particularly high in forests (over 850 species), grasslands (about 650 species) and steppe remnants (over 600 species). More than 30 species of woody plants are important sources of livelihood for the rural population, about 200 species of medicinal plants, and about 700 species of plants in the spontaneous flora are fodder plants that serve as food for wild animals and animals. A total of 1,357 species of fungi, including 557 species of macromycetes, populate forest ecosystems. Only 70 species of the total number of mushrooms are edible.

Fauna. In Moldova there are about 16,540 species of animals (474 vertebrates and over 16,000 invertebrates). These include 55 Ponto-Caspian relict species (10% of which are endemic to the Black Sea Basin) and 219 species from the 3rd Red Book (2015). Vertebrate animal species are represented by 75 species of mammals, 281 species of birds, 14 species of reptiles, 14 species of amphibians and 90 species of fish. Although the greatest diversity of vertebrates – 172 species, is recorded in forests, and 153 (89%) of these are found in forests associated with grasslands. Riverside corridors and wetlands are particularly important for migratory birds. The Republic of Moldova borders the Balkan region and forms a transition zone between the elements of the Asian continental steppe fauna and the European forest-steppe.

Forest biodiversity. Up to 28 types of forest ecosystems (or forest formations) have been identified in Moldova's forests, some of which are the most biologically and economically important for the country, such as oak formations, downy oak (pubescent), beech, flooded forest, black grasshopper and many varieties of all these and other species. The "*cherry forest oak*" type is widespread in the north of the country and covers an area of 11 600 ha. It is characterized by monodominant stands of pedunculated oak (*Quercus robur*) with a high presence of wild cherry (*Prunus avium*). Its floristic composition includes about 350 species of vascular plants, with 10 rare species. The forest type "*oak and beech pedunculated oak*" in central Moldova covers about 160,000 ha. The floristic diversity of these ecosystems is the richest in the country and includes over a thousand species of vascular plants. 17 species of plants are included in the Red Book of Moldova, such as: glandular wedge (*Dentaria glandulosa*), flyer's feather (*Lunaria annua*), dwarf wheat (*Euonymus nana*), elegant crown (*Coronilla elegans*), forest peony (*Paeonia peregrina*), common olive (*Padus avium*), domestic *sorrel (Sorbus domestica*), strawberry Longifolia (*Cephalanthera longifolia*), Lady's Slipper, (*Cypripedium calceolus*) etc. The greatest diversity of vascular plants is found in the Codrii (with 945 species) and "Plaiul Fagului" (with 720 species) nature reserves. *Downy oak (Quercus pubescens*) ecosystems are present in the south of the country and cover about 7000 ha. Their floristic diversity includes about 400 species of vascular plants, some of which are included in the Red Book of Moldova, such as: angelescu cornflower (*Centaurea angelescui*), fingerlings (*Pulsatilla grandis*), hair-eleagnifolium (*Pyrus elaeagnifolia*) and others.

The azonal forest ecosystems of willow, poplar and oak, which are of the flooded forest type, in the lower Prut basin cover an area of 15 000 ha. Their floristic diversity includes about 400 species of vascular plants, including rare species in Moldova, such as: black alder (*Alnus glutinosa*), white alder (*Alnus incana*), forest vine (*Vitis sylvestris*), variegated tulip (*Fritillaria meleagris*), snake's tongue (*Ophioglossum vulgatum*) etc. About 1140 species of vascular plants are registered in the forest and forest-steppe areas of the country, which represents over 60% of all plant species in Moldova.

In the forest ecosystems of Moldova there are 172 species of terrestrial vertebrate animals (47.8% of the total species in Moldova), of which 47 species are mammals, birds - 106, reptiles - 9 and amphibians - 10 species. The diversity of invertebrates is even greater, including over 9,000 species with a number of species listed in the Red Book of Moldova.

Ex-situ preservation

The ex-situ conservation of biodiversity is ensured by the **collections of the genetic fund of plants** by the Alexandru Ciubotaru Botanical Garden (Institute) of the University of Moldova, which preserves about 11 thousand species, of which: tropical and subtropical plants – 2,517 sp., ornamental floral plans – 1,150 sp., woody plants – 2,000 sp., non-traditional fodder plants – 350 sp., medicinal plants – 300 sp., aromatic herbs – 350 sp., etc. In recent years, the genetic fund of the Botanical Garden (Institute) has been supplemented by 1,456 sp., including: woody plants – 170 sp., flowering plants. – 601 sp., tropical and subtropical plants – 439 sp., medicinal and aromatic plants – 148 sp., fodder plants – 98 sp.

The herbarium of the Botanical Garden (Institute) "Alexandru Cibotaru" and the Faculty of Biology and Geosciences of the University of Moldova lists a collection of about 320 thousand samples of plants from various floristic regions, as well as collections and exhibitions of spontaneous plants with a genetic fund of about 7.5 thousand taxa. Over 100 species of rare plants from the spontaneous flora of the Republic of Moldova are stored in the living collections of the field, of which 54 are included in the third edition of the Red Book.

The zoological collections of the Republic of Moldova, held by academic institutions of research and education, museums, scientific reserves, comprise about 14,000 species of vertebrates and invertebrates, of which 182 species of birds and of which 5800 species of cockroaches and 3600 species of butterflies; collections of fossil animals – 500 species.

The collection of microorganisms constitutes the National Collection of Non-Pathogenic Microorganisms, which has deposited 28 microorganisms from different taxonomic groups, isolated from various environments, which are characterized by a valuable biochemical potential, being considered prospective biotechnological objects. Genetic microbial resources are used in various branches of the national economy: the food industry (dairy, bakery), the wine industry,

pharmaceuticals, etc. Valuable microbial strains are stored in the collections of research institutes or production associations.

The basis **of the Forest Seed Fund** includes stands as seed sources, consisting of the most productive and stable natural stands, seed plantations, geographical crops, etc. The total area of the Forest Seed Fund is about 2,414.9 ha.

Agricultural biodiversity

The agricultural and plant biodiversity of the Republic of Moldova, including their wild relatives, is preserved ex-situ in experimental fields and seed collections by research institutions in the field. The Catalogue of Plant Varieties for 2024 includes 2919 varieties, of which 73 sera are new, including cereals – 450 varieties (corn – 283, soybean – 33 varieties), grain legumes – 681 varieties, oilseeds – 281 varieties, technical plants – 74 varieties, fodder plants – 32 varieties, aromatic and medicinal plants – 43 varieties, ornamental plants – 56 varieties, fruit trees and shrubs – 333 varieties, vines – 108 varieties.

The seed collection of the **National Gene Bank** owned by the National Center for Plant Genetic Resources of the Republic of Moldova, established by Government Decision no. 1203/1998, within the Institute of Genetics, Physiology and Plant Protection of the State University of Moldova, maintains the genetic material of about 5.4 thousand samples from 34 botanical families, 145 genera and 223 species, including the most important varieties of cereal plants (wheat, rye, barley, triticale, etc.), corn (over 700 samples), legumes (beans, chickpeas, lentils, etc.), vegetables – 820 varieties, peppers – 200 genotypes, eggplants – 60 varieties).

The benefits of genetic resources and their equitable sharing

Plants of spontaneous flora**,** especially medicinal plants, provide an important source of nutrients and therapeutic agents through the wide presence of biologically active compounds such as alkaloids, glucosinolates, cyanogenic glycosides, flavonoids, tannins, coumarins, lignans, terpenoids, saponins, organic acids and many others, and are widely used in the **pharmaceutical and cosmetic** business sector. Aromatic plants are used as raw materials for the production of perfumes and cosmetics; others have found application in aromatherapy and phytotherapy. Many herbs serve as spices, which can reduce the load of microbial pathogens in food, improve taste, and aid digestion.

The genetic background of domestic animals includes breeds of cattle, goats, rabbits, chickens, turkeys, geese, ducks and fish, bred in the country or imported from other states.

In order to protect the diverse genetic resources, the potential of genetic resources to generate tangible local and national economic benefits, international provisions on the sharing **of benefits** offered by genetic resources, which can have **both monetary and non-monetary** value, are to be implemented. Scientific research on genetic resources, **digital gene sequence information** (DSI) carried out through

international academic collaborations can at the first stage serve as a sharing of non-monetary benefits, expressed through the provision of intellectual rights, joint scientific publications, etc.

The country's limited administrative and financial capacities are the main challenges in establishing ABS measures. Insufficient policies, current legal and institutional framework do not provide tools to ensure the sharing of benefits related to the use of genetic resources. Consequently, there are no requirements for obtaining an **Agreement on the Conditions of Access** to Genetic Resources concluded between the provider of genetic resources and a user **(PIC)** and **Prior Informed Consent**, obtained with the permission of the competent national authority or authorities of the provider's country **(MAT)** to access genetic resources in Moldova. The benefits can also be considered when using traditional knowledge, associated with genetic resources, which are shared with local communities.

It is necessary to ensure a special **public awareness** campaign for various stakeholders, in order to raise awareness of the scope and mechanisms of the Nagoya Protocol and the benefits that the country, nature and owner users will be able to obtain.

The interaction between providers and users of genetic resources, in particular between **local communities and private companies,** will be improved and their interests will be balanced to satisfy both users who wish to have continued access to genetic resources and providers of these resources who request to receive a fair share of the benefits arising from their use.

The regulatory framework in the field of regulation of genetic resources has been adjusted in accordance with the provisions of the Nagoya Protocol, at the same time in order to ensure the functioning of the benefit-sharing mechanism in accordance with the provisions of the protocol, it is necessary to develop national regulations on the fair and equitable sharing of benefits resulting from the use of traditional knowledge associated with genetic resources.

Although the Republic of Moldova has important collections of spontaneous and agricultural flora and fauna species and their maintenance by the institutions in the field is ensured, there is a need for **increased funding** for completing and maintaining the completion of the collections of genetic biodiversity, as a national heritage. In addition, it is also important **to make** available the plant genetic resources preserved in ex-situ collections and to encourage their conservation and maintenance on farms, including the proper functioning **of the plant genetic resources bank,** the conservation of germ plasms, as well as the general applications of plant propagation, including through the application of biotechnological methods. In particular, the 10% increase in the number of batches of plant genetic resources held in public gene banks through collection, propagation material and seed exchange is to be ensured.

Record keeping and data exchange in digital format It is essential to ensure interinstitutional exchange at national and international level. Currently, only

limited information on plant species collections exists in digital format is accessible. In the context of the transposition of EU legislation, it is necessary to update **Registers (Cadastres)** of spontaneous plant and animal species, rare species included in the Red Book, microorganisms, agrobiodiversity, etc., as well as ensuring a monitoring and record-keeping system. It will serve to form a **National Registry of Genetic Resources** and evidence **international ABS authorizations/certificates** for the use of genetic resources.

Needs and actions

Target 13. Fair and equitable sharing of benefits from genetic resources in accordance with the provisions of the Nagoya Protocol

- Develop national regulations on the fair and equitable sharing of benefits arising from the use of traditional knowledge associated with genetic resources, in accordance with the Nagoya Protocol
- Establish a checkpoint/agreement mechanism on the fair and equitable sharing of benefits arising from the use of traditional knowledge associated with genetic resources;
- Making conserved plant genetic resources available in ex-situ collections and encouraging their conservation and maintenance on farms.
- Gene banks of extended agricultural crop species and varieties (Institute of Genetics)

Updating the Register (Cadastre) of spontaneous plant and animal species, genetic resources, rare species, invasive species, etc., in digital format.

Section 12. Biosecurity and genetically modified organisms

The earth's biological resources are vital for maintaining and sustaining food security, economic development and health. The Sustainable Development Goals establish that global food production must increase by 70% by 2050. Globally, it is recognised that modern technologies can contribute to achieving this goal. Given the increase in food insecurity, population growth, climate change and socio-economic stress, the products of modern biotechnology, especially genetically modified organisms (GMOs) in agriculture, are considered an attractive source of effective innovations.

The Republic of Moldova is a predominantly agricultural country. Agriculture plays an important role in the economy of the Republic of Moldova, as it involves 36.1% of the population. Throughout its history, agriculture in Moldova has been the main source of subsistence for the population.

With the advancement of agricultural biotechnology, many GM crops have been developed and marketed to meet the needs of the world's population, but biosafety concerns persist and must be prevented or minimized in the adoption of the commercialization of GM crops. Risk assessment identifies the potential hazards and adverse effects of GM crops or derived products on non-target organisms and the environment. Risk management issues remain particularly important in the use of GM crops to minimise the negative effect of GMOs.

As a party to *the Cartagena Protocol on Biosafety to the Convention on Biological Diversity*, ratified by Law No. 1381/2002, and to *the Nagoya-Kuala Lumpur Additional Protocol on Liability and Compensation for Damage* to the Cartagena Protocol on Biosafety, ratified by Law No. 96/2018, the Republic of Moldova has the obligation to contribute to ensuring an adequate level of protection in the field of biosafety. safe transfer, handling and use of genetically modified organisms (GMOs) obtained through modern biotechnological processes that may have adverse effects on the conservation and sustainable use of biological diversity, also taking into account risks to human and animal health. Moldova recognises **the potential important benefits** that GMOs, resulting from modern biotechnology, could have for the promotion of human well-being and food security, such as increased food production and reduced use of pesticides, human health (prevention of diseases with modified vaccines); promoting technology transfer, etc. However, in view of information on **potential risks** that GMOs could pose to biodiversity or human health, such as unintentional harm to other organisms, unintentional gene transfer between organisms, allergens in food and antibiotic resistance, Moldova aims to control, minimise and prevent the potential adverse effects of GMOs through risk assessment and risk management measures, liability measures and compensation for damage to biodiversity.

The targets and indicators of the *Global Biodiversity Framework 2030* call for a national approach to achieve the overall goal of halting biodiversity loss by 2030. Moldova considers biosecurity as a national priority for reducing direct threats to biodiversity.

European Union legislation reflects the concern about the risk of accidental contamination: the accidental introduction of GMOs into organic or conventional crops has been recognised as 'technically unavoidable', thus ruling out the possibility of achieving zero tolerance. The Republic of Moldova has undertaken the fulfillment of several objectives associated with ensuring a complex system for reducing the direct threat to biodiversity within the National Action Plan for the accession of the Republic of Moldova to the European Union for the years 2024-2027, approved by G.D. 829/2023, Chapter 12 "Food safety, sanitary and phytosanitary policies". Part of the process of adhering to EU biosecurity rules is also the authorisation of the use of genetically modified products, including for food, feed and processing, which requires companies to meet the requirements for assessing risks to human health and the environment and to comply with clear labelling rules.

In order to align with EU standards and regulations in the field of biosafety, Moldova is to transpose a number of directives and regulations on GMOs at national level. Therefore, it is necessary to develop a legal framework on the isolated use of genetically modified micro-organisms, which transposes Directive 2009/41/EC of the European Parliament and of the Council of 6 May 2009 on the isolated use of genetically modified micro-organisms; on transboundary movements of genetically modified organisms, which transposes Regulation (EC) no. 1946/2003 of 15 July 2003 on cross-border movements of genetically modified organisms; on the traceability and labelling of genetically modified organisms, which transposes Regulation (EC) no. 1830/2003 of the European Parliament and of the Council of 22 September 2003 on the traceability and labelling of genetically modified organisms and the traceability of products intended for food or feed, produced from genetically modified organisms, and amending Directive 2001/18/EC.

Authorisation of uses of genetically modified organisms (GMOs)

Soybean crops and products, and less so corn, can be potential sources of GMOs, grown or imported. Currently, the area cultivated with soybeans in the country is 30-33.0 thousand hectares, with an average productivity of about 1.3 tons/ha. The total volume of raw soybeans that can be produced in Moldova is limited to only 45. thousands of tons, thus creating the need to import soybean meal. To provide the national livestock sector with soybean meal, about 52.0 thousand tons of flour are needed annually. Moldova imports significant quantities of soybean products, mainly soybean meal/soybean meal. Since a significant amount is imported from Ukraine, Brazil, and Argentina, which can be assumed to contain genetically modified soybeans.

In the Republic of Moldova, the import was authorized only for the meal obtained from the accepted genetically modified soybean lines, for use as food products and food and feed ingredients. To date, three lines of genetically modified soybeans – MON 89788, MON-87701 and Roundup Ready MON-40-3-2, have been approved for import, intended for food and feed use for poultry companies. For these genetically modified soybean varieties, the risk assessments carried out by the European Food Safety Agency (EFSA) were considered. Currently, a total of 15 domestic economic agents hold authorizations for the import of meal obtained from genetically modified soybeans. At the same time, it is worth mentioning that during the activity of the National Commission for Biological Safety, no genetically modified living organism was authorized, intentionally introduced into the open environment (cultivated).

GMO risk assessment

For the operationalization and implementation of Law no. 152/2022 on the regulation and control of genetically modified organisms, it is necessary to develop normative acts, guidelines and operational manuals, especially on risk assessment and

risk management, detection and identification, monitoring and control of GMOs, which require the extensive involvement of the academic research sector. It is necessary to apply the methodology on the risk assessment caused by GMOs on biological resources and human health, by transposing the Guidance on risk assessment of living modified organisms and monitoring in the context of risk assessment, a tool to help carry out the risk assessment, developed according to Decision no. BS-VIII/12 a CBD.

GMO testing and detection

Strengthening national capacities for testing and control of genetically modified organisms (GMOs) in food and feed can be achieved by introducing new accreditation methods at national level, as well as increasing the number of food and feed samples tested for GMO content. There are limited capacities to establish a monitoring and surveillance system for GMOs. The Molecular Biology Laboratory of the I.P. "Central Phytosanitary Laboratory" within the National Agency for Food Safety (ANSA), ensures the testing of seeds and biological materials on the GMO content of various agricultural products, including soybeans, corn, rapeseed, wheat, rice, alfalfa, cotton, flax seeds, fenugreek seeds, sweet peppers, plums, potatoes, beans, tomatoes, sugar beets, sugar cane, papaya, apple. The laboratory, among its functions, is accredited as a national reference laboratory to the international standard SM EN ISO/IEC 17025:2018. Also worth mentioning, the laboratory does not have sufficient capacities to ensure the multitude of needs to ensure control and monitoring of imports and cultivation of agricultural products and food, having limited capacities of personnel, equipment and materials. In order to prevent transboundary movements or illegal or unintentional use of GMOs, but also to apply emergency measures and prevent possible damage to biodiversity, it is necessary to strengthen capacities for GMO testing, by diversifying the network of GMO detection laboratories, including, in the territory, within the framework of ecological inspection, customs control, the private sector, equipping them with high-performance equipment, staff training, accreditation, etc.

Liability and compensation for damage

The Nagoya-Kuala Lumpur Additional Protocol on Liability and Compensation to the Cartagena Protocol on Biosafety, which provides for the need to implement rules and procedures in the area of liability and compensation for damage resulting from the transboundary movement of genetically modified organisms. It is necessary to develop a legal and institutional framework, as well as specific operational guides and manuals for the implementation of liability and compensation procedures in accordance with international requirements. **The labelling** of products/foods that are produced or contain GMOs must be based on clear rules, transparent international standards.

Needs and actions

MD Target 17: Ensure functional biosecurity in accordance with the Cartagena Protocol and the Nagoya-Kuala Lumpur Additional Protocol on Liability and Compensation

- Drafting regulations on the use of genetically modified microorganisms in isolation
- Regulatory and control of genetically modified organisms
- Ensuring procedures for cross-border movements of genetically modified organisms
- Development of procedures for environmental risk assessment and risk management for the use of GMOs, in accordance with the Guidelines on the risk assessment of living modified organisms, according to Decision BS-VI/12 of the Cartagena Protocol
- Improving the identification and monitoring system of GMOs, including in agricultural products, foodstuffs, etc.
- Ensuring the accountability and recovery mechanism under the provisions of the Nagoya-Kuala Lumpur Additional Protocol on Liability and Compensation

Section 13. The impact of climate change on biodiversity

Ecosystems and protected natural areas in the Republic of Moldova are under pressure from climate change and other stressors, such as land use change. Many species of animals and plants are experiencing changes in their life cycle and migrate to northern regions and higher altitudes, while various invasive species have established themselves or expanded their range. These changes affect different ecosystem services and economic sectors, such as agriculture, forestry and aquaculture.

The main health effects of climate change are related to extreme weather events, changes in the distribution of climate-influenced diseases, as well as changes in environmental and social conditions. Health effects include injury, infection, exposure to chemical hazards, and mental health consequences. Heatwaves have become more frequent and intense, causing tens of thousands of cases of premature death in Europe. This trend is expected to increase and intensify if appropriate adaptation measures are not taken.

The Republic of Moldova is mainly exposed to **three types of climate impacts**: temperature rise, changes in precipitation and increased climatic aridity,

which are associated with the amplification of the frequency and intensity of extreme climatic phenomena, such as: heat waves and frosts, severe droughts, floods, storms with heavy rains and hail. These conclusions are drawn up on the basis of projected climate change scenarios, accompanied by a number of impact, risk and vulnerability assessments carried out in the process of drafting national communications, together with other assessments carried out at project level, with national and regional coverage. This activity is the starting point for setting medium and long-term priorities for planning, action and investments for adaptation, in parallel with monitoring the effectiveness of the adaptation measures planned and implemented in the Republic of Moldova. We are already seeing the effects of global warming, which are manifested by the intensification of extreme natural disasters and the heat waves felt more and more frequently. **(Figure 11).**

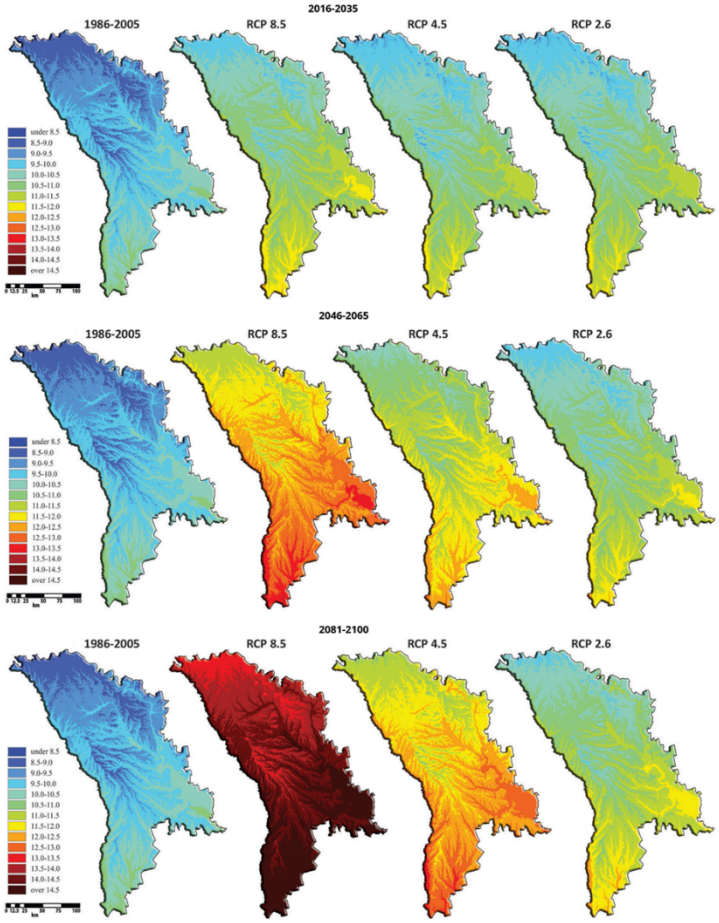

Figure 11. Evolution of the average annual air temperature (° C) projected according to three multi-model scenarios (RCP 8.5, RCP 4.5, RCP 2.6) briefly (2016-2035), medium (2046-2065) and long-term (2081-2100) compared to the reference period (1986-2005) in the Republic of Moldova. Climate change scenarios range from the most optimistic (right) to the most pessimistic (left) GHG emissions scenario projections

Due to the still low index of afforestation of the territory, in the Republic of Moldova there is an intensification of soil erosion and landslides, unfavorable change of the hydrological regime, continuous aridization of environmental conditions. Forests are the main element in ensuring ecological balance in this geographical area. Thus, the problem of conservation and sustainable development of existing forests, as well as the extension of forest lands by afforestation of new areas unsuitable for agricultural use, is a problem of national interest.

The establishment and management of stable and diversified forests that can adapt to climate change represent important challenges and will require the implementation of actions to reduce the vulnerability of the forest sector. Also, taking advantage of the opportunities offered by the forestry sector to mitigate the effects of climate change in other sectors of activity, requires a series of measures applied in the forestry sector, with a significant impact on the reduction of greenhouse gas emissions and a better management of the effects of climate change in agriculture, water management, infrastructure/communications, prevention of natural disasters, etc.

According to a series of national and international policy documents and reports, the rapid pace of climate change due to human activity exceeds the natural capacity of forest ecosystems to adapt. Thus, some territories within the Republic of Moldova may no longer be favorable to the development of certain types of forests, which will cause changes in the natural distribution of forest species and changes in the growth of existing stands. Extreme events, such as storms, forest fires, droughts and heat waves, are expected to become more frequent and/or severe, thus increasing the pressure on forests.

The increase in forested areas contributes to meeting global environmental objectives regarding the reduction of CO2 emissions for climate change mitigation and the increase in the use of renewable energy sources. Through their ecological, social and economic functions, forests provide various goods and services for society, such as wood and non-wood products, recreational spaces, landscape beautification, etc., which complement the reasoning of the intervention by this measure.

Climate change could pose a threat to the biodiversity of Moldova's forests in the following ways:

- changes in the behavior of the species, as a result of the stress induced to their ability to adapt;
- the modification of the distribution and composition of habitats, as a result of the change in the structure of the species;
- the rise of exotic species (introductory) at the level of current natural habitats and the increase of their potential to become invasive;
- modification of the distribution of ecosystems specific to wetlands, with their possible limitation and eventual disappearance;
- changes in natural ecosystems and species in them, generated by warming and/or fires, etc.;

- the disappearance of certain species of flora and fauna.

Changes in climate patterns – including rising temperatures, changes in precipitation, and reduced ice and snow – have led to a wide range of negative effects, causing risks and vulnerability, including:

- Biodiversity loss: the survival of certain species will be threatened or they will disappear due to habitat loss, ecosystem changes and increased water acidity;
- Extreme weather events: more frequent extreme weather events, causing heat waves, wilderness fires, intensification of floods and droughts, stronger hurricanes;
- Threats to human health: the spread of disease and decreased air quality, as well as possible deaths caused by devastating heat waves.

The establishment of stable and diversified forests is a continuous measure and is planned to improve the stability of stands by selecting the appropriate species, origin and genotypes. The current requirements to increase forest productivity and forest economy development in terms of adaptation to climate change in the Republic of Moldova require the production of high-quality seedlings. In fact, according to the data of various activity reports of the national forest sector, it is confirmed that forest nurseries currently grow forest reproductive material, without relying on the requirements of EU standards and international treaty data on adaptation to climate change.

An eloquent example of the effect of climate change on the development of the forests of the Republic of Moldova became the drought of spring-summer 2007, which affected over 70% of the country's territory. This phenomenon has also considerably damaged the forests on an area of about 19 thousand ha or 6.3% of the area of the forests owned by the "Moldsilva" Agency, especially in the south and center of the country. The drought affected about 20 forest species, both native and alien, including: pedunculated oak (*Quercus robur*), holm oak (*Quercus petraea*), ash (*Fraxinus exelsior*), maple (*Acer platanoides*), mountain maple (*Acer pseudoplatanus*), acacia (*Robinia pseudoacacia*), birch (*Betula verrucosa*), pine (*Pinus sylvestris*), Crimean black pine (*Pinus pallasiana Holmboe*). The most affected were acacias, constituting an estimated 71.3% (13 thousand ha) of the total area of forests affected by drying. The drought of 2007 had long-lasting consequences, the consequences being visible during several subsequent years. Thus, according to the data of silvo-pathological research carried out by the specialists of the S.E. Institute of Forestry Research and Planning, the total area of degraded and dry stands of different intensity constituted in the period 2008-2011 over 33 thousand ha or 11.0% of the area of forests owned by the "Moldsilva" Agency.

Approximately the same destructive effect on the forests of the Republic of Moldova had the drought of 2012. Consequently, in the period 2012-2015 about 41 thousand ha of forests were affected by different degrees of dryness, most of them being attested in the southern and central areas. The process of forest drying is a constant phenomenon in the Republic of Moldova over the last decades. According to ICAS data, during the last decade (including the forecast for 2024), the area of forests affected by drying up was 104.6 thousand ha (**Figure 12**).

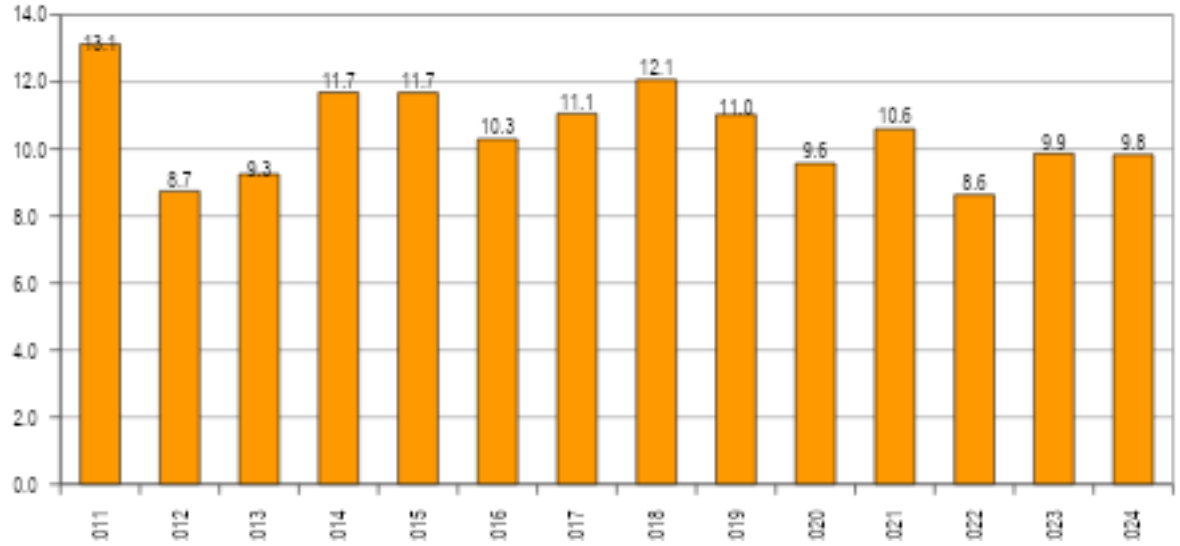

Figure 12. Dynamics of forest drying processes in the Republic of Moldova in the period 2011-2024, thousands ha

Source: ÎS. Institute for Forestry Research and Planning

Phytosanitary status of forests

The vulnerability of forests in the Republic of Moldova to climate change is confirmed by the current phytosanitary status of forest ecosystems. Thus, as a result of the droughts that occurred in 2007, 2011, 2012, 2015, 2019, 2020, 2022, there was a sudden weakening of forest ecosystems, a reduction in the biological resistance of trees to the action of negative factors, which led to the degradation of stands, intensification of drying processes on large areas and the creation of favorable conditions for the mass spread of phytophagous and xylophagous pests. The dynamics of outbreaks of defoliating pests in the stands managed by the "Moldsilva" Agency in the period 2010-2023 is presented in **Table 16**.

Table 16: Dynamics of outbreaks of defoliating pests in stands managed by the "Moldsilva" Agency

Indicators and main pests	The area of outbreaks at the end of the year, thousands of hectares														
	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	Average per period
I. Area of phytophagous pest outbreaks, total, including defoliating pest species:	56,0	61,0	85,3	79,8	63,5	43,8	45,9	69,9	101,3	83,8	70,6	66,4	65,6	56,1	68,9
- Green oak moth	3,9	2,7	75,9	59,2	37,2	14,5	13,2	20,0	25,5	24,0	27,1	27,5	23,9	17,5	27,6
- Green and brown coter	48,4	50,2	6,1	10,9	18,0	25,6	23,5	35,9	53,7	50,5	15,0	30,8	34,9	34,0	32,6
- Hairy caterpillar of the oak	0,0	0,0	0,0	0,0	0,0	0,0	0,0	3,6	7,3	1,2	19,5	1,2	0,3	0,4	1,4
- Ash leaf trumpet	3,4	3,0	3,3	9,5	8,3	3,7	9,2	10,4	14,4	7,9	0,0	6,9	6,6	4,2	7,4
- Other pest species (elm leaf wasp, etc.)	0,3	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,4	0,3	9,0	0,0	0,0	0,0	0,1
II. Area of outbreaks requiring aerial control measures	31,0	33,2	35,7	52,9	39,2	10,9	20,2	34,5	54,8	16,2	0,0	4,0	2,0	1,3	27,8

Source: "Moldsilva" Agency

According to this information, the average area of phytophagous pest outbreaks constituted about 68.9 thousand ha in the period 2010-2023, of which about 27.8 thousand ha or 40.6% required control measures. The main defoliating pests in the stands managed by the "Moldsilva" Agency are:

- Totricidae – Green oak moth (*Tortrix viridana*);
- Geomitrid – Green Cotarul (*Operopthera brumata*);
- Brown Crest (*Erannis defoliaria*);
- Cotarul (*Agriopis leucophaearia*);
- The hairy caterpillar of the oak *tree (Lymantria dispar);*
- Elm leaf wasp *(Aprocerus leucopoda Takeuchi);*
- Noctuide (*Noctuidae*);
- Ash leaf thrombler (*Stereonychus fraxini*).

Within the defoliating pests, the highest share and destructive effect were had by the cotari and the green oak moth (**Figure 13**). Although all these species are known in the forestry practice of the Republic of Moldova, during the last decades their outbreaks have had a cyclical development, being largely influenced by climatic conditions in critical periods of development (larvae, etc.), but also by the intervention capacities of central and territorial forest structures. The herd eruptions

that occur in some years deviate from the projections known/applied in the activity of the forest services for recording and monitoring forest diseases and pests. At the same time, the existing management technologies (detection and monitoring of outbreaks; operative signaling, etc.) and control are not very effective and require substantial improvements.

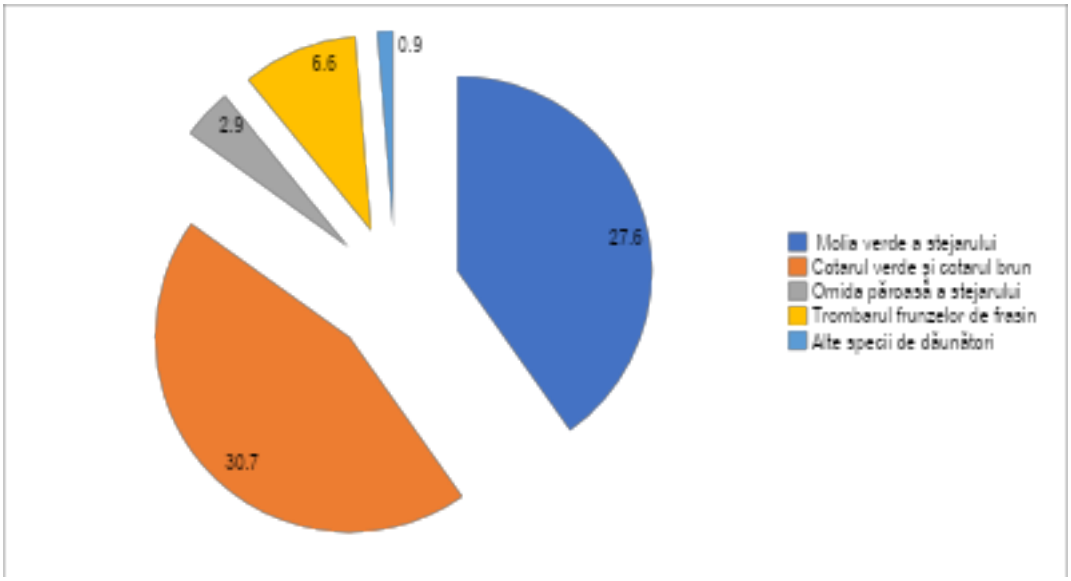

Figure 13. Distribution of outbreaks by species of defoliating pests, thousands ha

Source: I.P. Institute of Forestry Research and Planning

Dependence of forests on rainfall

Climate change influences the humidity conditions in forests through changes in both the thermal regime and the precipitation regime. In some areas of the Republic of Moldova, the reduction in the amount of precipitation in the future will accentuate the moisture stress caused by heating. Changes in the seasonality of rainfall and extreme phenomena, such as drought and heavy rainfall, will also be important.

The potential lack of summer rainfall, with long droughts, is the main limiting factor of forest growth and productivity. Rising temperatures and changing rainfall patterns are the main factors that expose forests to the action of various insect pests and fungal diseases. During the period 2021-2039, it is expected that the phytosanitary status of forests will change significantly in the northern part of the country, where the areas with stands affected by drying will expand by about 15-25%. In the period 2040-2069, the change in the phytosanitary status determined by the level of drying of the trees in the northern part of the country will strongly stimulate the expansion to the south and south-east. Significant changes will take place in this area between 2070-2099. This process is already in full swing in the southern part and partially in the central part of the republic, being also confirmed by the extent of the

phenomena of forest drying and the share of hygienic cuts in the structure of forest treatments carried out in the forest fund managed by the "Moldsilva" Agency. Thus, according to the analysis of the data for the period 2005-2019, it is found that selective hygienic felling is applied annually on average on 8.2 thousand ha of forests affected by drying phenomena with the harvest of a total volume of 106.8 thousand m3/year. In the general structure of forestry treatments, selective hygienic felling has an average weight of 37.1% by area and 20.9% – by volume. Also here, it is mentioned that part of the stands affected by drying are included in the regeneration emergencies through forestry treatments attributed to the main products or through ecological reconstructions.

Impact on species

The measures to adapt to changes in the continental-temperate bioclimatic zone, which includes the forests of the Republic of Moldova, are very diverse. The research, which is currently taking place and those planned, includes topics related to the adaptation of seedlings, biotic and abiotic damage, biological diversity, especially genetic diversity, adaptation of operations and techniques specific to the forest sector, as well as the protection functions of forests. Measures at stand level (regeneration, cultivation operations, harvesting, etc.) aim to reduce the risks of negative effects of an abiotic nature (fires, winds, drought) or biotic.

The impact on individual species can be negative or positive depending on seasonal conditions and climate change at regional level. Hornbeam and ash are the most vulnerable species, with ash showing a 20-40% decrease in biomass accumulation. Linden is expected to achieve higher growth by the year 2040, followed by a steady decline. Beech, located at the lower limit of its natural range, will show a decrease in biomass production of up to 50% by 2050, but in the short term it has the capacity to participate in the realization of stable forest structures in terms of ecosystem and productivity. Gorun seems to be less affected by the new climatic conditions, with increases in volume being predicted until 2090, followed by constant decreases. The pedunculated oak is less scientifically documented at international level, but being of special importance at the level of the Republic of Moldova.

The downy oak, also less documented, seems to prove a high ability to adapt to climate changes, having the ability to maintain its growths and especially vitality even in conditions of higher temperatures and drought. The most vulnerable regions in the Republic of Moldova will be: the south and partially the center (where the largest area covered by forests is currently located, 209.4 thousand ha, or about 14.5% of the total territory of the geographical area).

Most of the forests in the process of drying represent cvercinee stands (63.6%), followed by acacia stands with a share of 16.3% and ash stands with 5.2% **(Figure 14).** The rest of the species have lower shares, including resulting from the degree of participation in the composition of the forests in the Republic of Moldova.

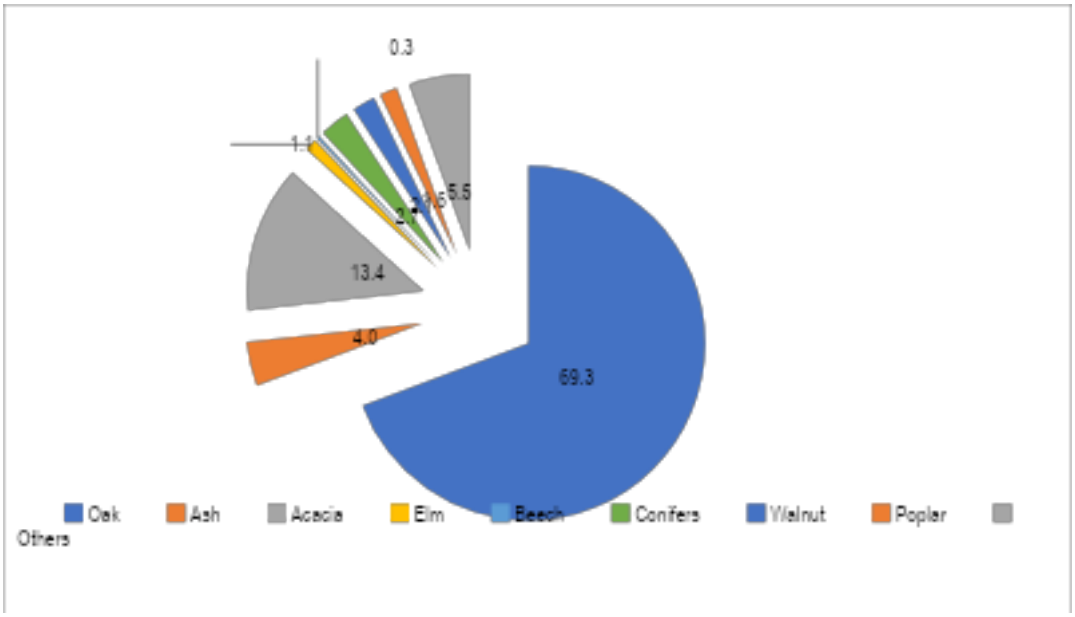

Figure 14. Distribution by species of the forest drying process in the Republic of Moldova, %

Source: I.P. Institute of Forestry Research and Planning

Impact of wildfires

Climate variability, with all its components, extreme temperature values and lack of rainfall during periods of drought favor the exposure to fires of agricultural crops, feed warehouses, areas with forest vegetation, houses, etc. The effects on the soil depend on the type and moisture content of the soil. On dry and coarsely textured soils, fires leave a hydrophobic layer in the soil (by accumulating chemicals, resulting from burning vegetation, in the lower layer of the litter).

Following a fire, through the disappearance of vegetation, the erosion and erosion intensify, especially in areas naturally susceptible to erosion. Flood hazard also increases. After a fire, watersheds experience a higher potential for erosion and flooding. During high rainfall or storms, the mineral compounds are removed and deposited in reservoirs designed to ensure the water supply of people.

Fires are classified by the fuel layer that allows the fire to spread. Thus, the following are distinguished: basic fires (they crawl exactly below the surface of the land with shiny combustion), surface fires (they move along the topographic surface) and crown fires (by burning in flames, produced by strong winds and helped by very high slopes).

Forest fires are an integral part of forest ecosystem dynamics in many ecosystems, as they are an essential element of forest renewal. They help control insect and disease damage and remove litter that has accumulated in the "basement" of the forest. At the same time, forest fires are a significant disruptor in many forested

landscapes. The risk of fire depends on many factors, such as weather, vegetation (e.g. loading and fuel status), topography, forest management practices, socio-economic context, etc. The extreme fire episodes and fire seasons of the last decades in the Republic of Moldova were, in most cases, determined by severe fire weather conditions. Although, most fires are started by humans (either accidentally or intentionally), it is widely recognized that weather conditions and fuel buildup play a dominant role in altering fire risk over time.

In this context, climate change is expected to have a strong impact on forest fire regimes in the Republic of Moldova. This is confirmed by the statistical data of the respective compartment for the previous period. Thus, the forest area covered by fires in the Republic of Moldova increased essentially from 2000 to 2022 with strong interannual variability (**Figure 15**). The significant annual fluctuations/increases are cumulated with the major drought events recorded in the Republic of Moldova (2007, 2012, 2020, etc.).

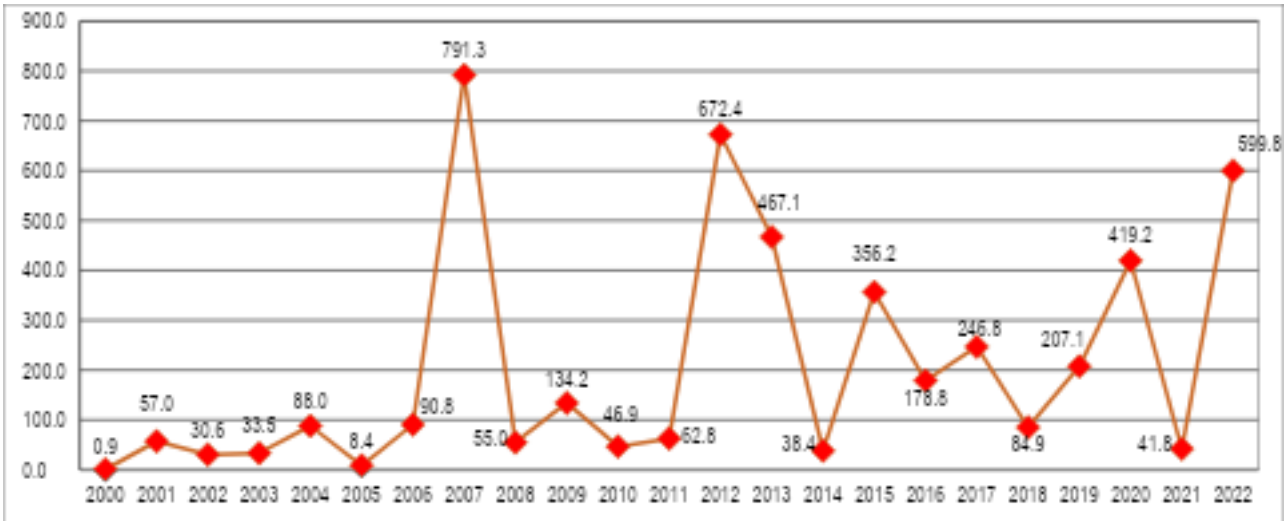

Figure 15. Dynamics of forest fires in the Republic of Moldova in the period 2000-2022, ha

Source: National Bureau of Statistics

In In order to mitigate the defective climatic effects, the Republic of Moldova has recently approved two national programs, such as:

- The National Program for Adaptation to Climate Change until 2030 approved by GD no. 624/2023;
- The National Program for the Extension and Rehabilitation of Forests for the period 2023-2032 and the Action Plan for its implementation for the period 2023-2027, approved by GD no. 55/2023.

The projections and impacts of climate change are to be framed in the forest management process, as well as in afforestation, reforestation and regeneration practices, including in the activities of:

- elaboration and implementation of forest management plans (forest management);
- forest fire detection and protection;
- forestry operations in vulnerable and inadequate stands;
- forest protection practices that take into account changes in the profile of pests and associated hazards;
- specific measures to optimise compositions in order to improve the overall sustainability of forests;
- forestry and regeneration operations to replace single-species stands with mixed and multi-species stands;
- maintaining and restoring wetlands within forest bodies for biodiversity conservation and protection against climate change;
- training and development of forest specialists, empowered in the field of climate change, its impacts on forests and the implementation of appropriate adaptation options.

In this integration process, the needs of forest beneficiaries, including women, young people, the elderly, people with disabilities and marginalized social groups, will be taken into account. At the same time, ecosystem-based adaptation (EbA) measures are mainly focused on:

- ecological reconstruction and rehabilitation of forest, steppe and meadow ecosystems (wetlands);

- the expansion of protected areas with a forest profile to ensure the in-situ conservation of representative and vulnerable biological diversity, the protection of the genetic diversity of native species, as well as minimizing the loss of biodiversity caused by climate change;

- ensuring a functional management of the National Ecological Network and the Emerald Network as part of Natura 2000 to ensure the survival of vulnerable flora and fauna species;

- implementing a mechanism for monitoring and controlling invasive species and minimizing risks to ecosystems.

According to the World Bank's assessment presented in the report on Investment Planning for Climate Adaptation in Moldova[37], the priority investments needed between 2020 and 2030 for the ecological reconstruction of forests and forest curtains in the country represent about US$96 million. The updated NDC for the

[37] BM, 2016 Planificarea investițiilor pentru adaptarea climatică în Moldova

Republic of Moldova (2020) estimates priority investments of about US$170 million in the sector by 2025 – to strengthen the expansion process of land covered with forest vegetation, intensify the restoration of degraded grasslands, improve forest monitoring and management.

Nature-based solutions are applied to selected protected areas and ecosystems. The compensation mechanism and forest management planning is based on the digital database system. Regarding technical barriers, it was found that there are no platforms for sharing Biodiversity Data, which makes it difficult to access and use information in this field.

In order to ensure adaptation to climate change, implementation of the following measures:

- Nature-based solutions (NbS) on the restoration of agroecosystems in the Dniester River basin to reduce pollution in the Black Sea basin by creating curtains and afforestation of riparian strips;
- Adapting regeneration and logging practices to the needs of climate change;
- Targeted use of modern biotechnologies for the propagation of vegetative material to provide the forest sector with reproductive material in the new climatic conditions, through the creation of regional centers for the industrial growth of forest reproductive material.

Needs and actions

MD8 target. Minimising the impact of climate change, including through nature-based solutions and/or ecosystem approaches

- Nature-based solutions (NbS) on the restoration of agroecosystems in the Dniester River basin to reduce pollution in the Black Sea basin through the creation of curtains and afforestation of riparian strips
- Adapting regeneration and logging practices to the needs of climate change
- Targeted use of modern biotechnologies for the propagation of vegetative material to provide the forest sector with reproductive material in the new climatic conditions, through the creation of regional centers for the industrial growth of forest reproductive material.

Section 14. Impact of pollution on biodiversity

Air pollution.

The main sources of air pollution in the Republic of Moldova are: stationary (fixed) sources, which include thermal power plants (CETs) and boiler plants, industrial enterprises in operation (pollutant discharges being shown in Figure 5); mobile sources, which include car, rail, air, river transport (discharges and pollutants emitted being shown in **Figures 16 and 17**), agricultural technology and the cross-border transfer of pollutants. The pollutants obtained from these sources are: carbon oxides, formaldehyde, sulfur dioxide, nitrogen dioxide and nitrogen oxides, particulate matter, lead, benzene, carbon monoxide, arsenic, cadmium, nickel and benzo(a)pyrene.

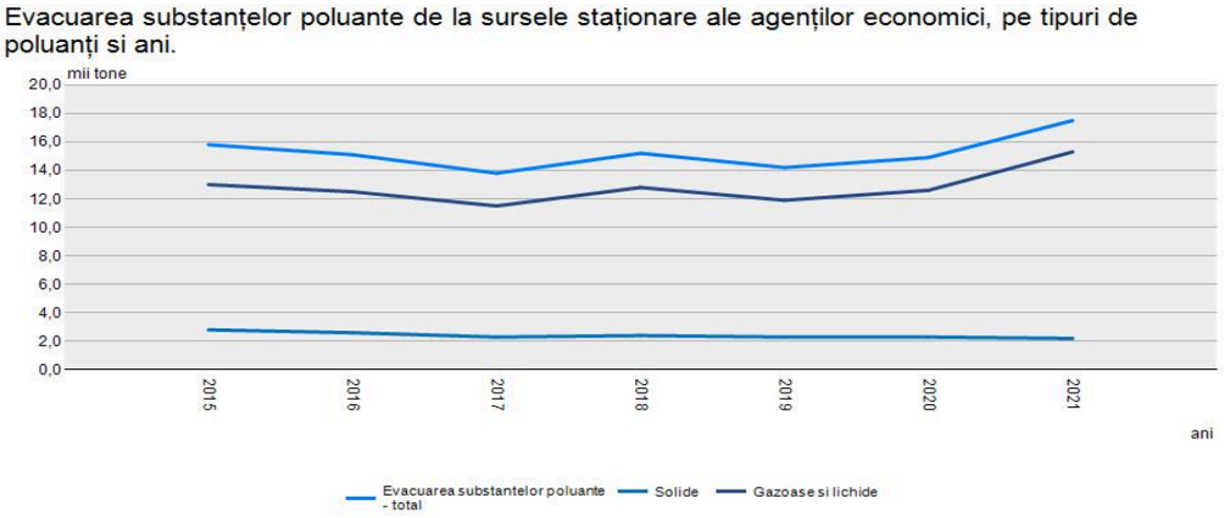

Figure 16. Pollutants from stationary sources of economic agents discharged into atmospheric air, thousand tons, for 2015-2021

Source: National Bureau of Statistics

The sources of emission of pollutants into the atmosphere are not uniform throughout the country, emissions in urban areas are higher than in rural areas, given the fact that large industries are concentrated in cities and municipalities. The largest sources of pollutant emissions into the atmosphere are: CET Dnestrovsk, CET-2 and CET-1 Chisinau, CET Nord Balti, the "Lafarge" cement plant in Rezina and the metallurgical plant in Ribnita, the "Macon S.A." building materials plant, as well as the 3,252 functional boiler houses, which operate with obsolete and outdated equipment.

Emissions from mobile sources (which make up 86.2% of the summary volume of harmful substances emitted into atmospheric air) contain large quantities of hydrocarbons, carbon oxides, nitrogen, sulfur, etc., depending on the quality of the fuel, the technical conditions of the vehicles, the number of transport units operated, etc. **Figure 18.**

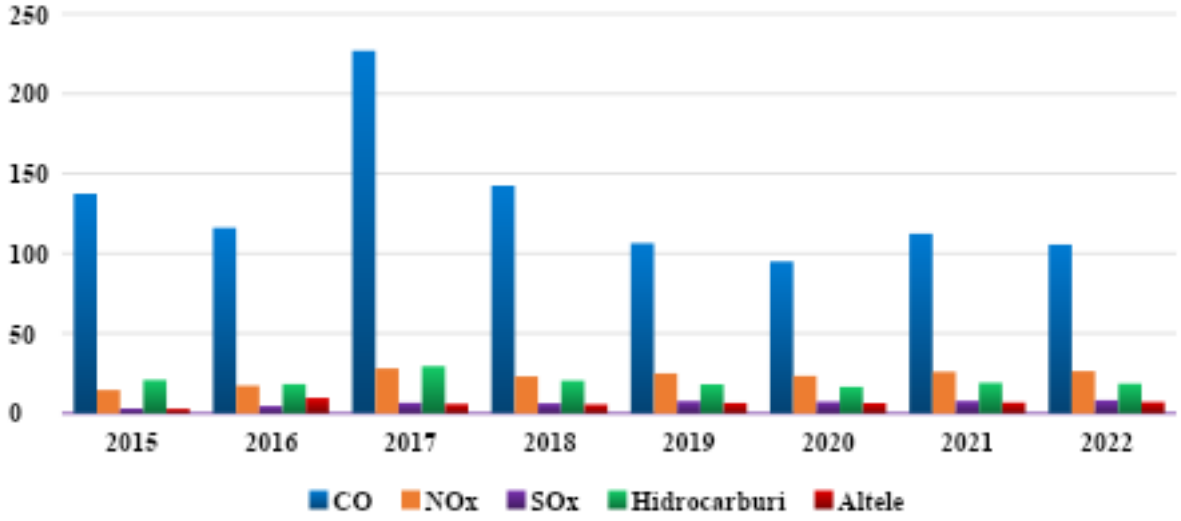

Figure 17. Pollutants in atmospheric air from car transport 2015-2022

Source: National Bureau of Statistics, Environment Agency

Figure 18. Dynamics of emissions from mobile sources

Source: Inventory Information Report of the Republic of Moldova 1990-2020, submitted to the UNECE Convention on Long-Range Transboundary Air Pollution, 2022

The reference laboratory of the Environment Agency carries out systematic monitoring of air quality and pollution, radioactive pollution on the territory of the Republic of Moldova through its 17 monitoring stations. Only the municipalities of Chisinau, Balti, Bender, Tiraspol and Ribnita, as the largest industrialized centers, are covered by the monitoring system.

Water pollution. The Reference Laboratory of the Environment Agency carries out systematic monitoring of surface waters on the territory of the Republic of Moldova in accordance with the Regulation on the systematic monitoring and survival of surface waters and groundwaters, approved by Government Decision no. 932/2013.

As regards the quality of surface waters, according to the continuous monitoring data, carried out by the Water Quality Laboratory of the Environment Agency, in the 54 monitoring sections located on 27 rivers, 6 reservoirs and 2 natural lakes in both hydrographic districts (Dniester and Prut, Danube and Black Sea) it is found that in 46.3% of the sections the level of water pollution was determined to be of class V (highly polluted) according to certain hydrochemical parameters and only in the case of 1.9% of class II (good) sections, according to **Table 19**.

Table 19: Percentage distribution to surface water quality classes in the 54 monitoring sections

Quality classes	%
I	0
II	1,9
III	31,5
IV	20,3
V	46,3

Source: LRM of the Environment Agency

Waste generation

Waste is a source of threat to biodiversity by worsening their living conditions. In the Republic of Moldova, the following sources of waste generation and recovery are identified **(Table 20):**

Table 20. Waste generation and recovery

ton/ *tons*

	Generation *of waste*			Recovery *of waste recovery*		
	2020	2021	2022	2020	2021	2022
Total	**415,045.0**	**415,768.9**	**264,783.9**	**307,018.2**	**247,803.0**	**172,212.6**
of which:						
agriculture, horticulture, aquaculture, forestry, hunting and fishing, food preparation and processing	325,766.5	300,368.1	135,391.1	232,066.5	159,913.5	60,544.1

from woodworking and manufacture of panels and furniture, pulp, paper and cardboard	1,807.3	2,631.3	2,741.3	651.2	743.3	2,449.2
from organic chemical processes	229.1	34.0	6.9	0.3	20.4	5.6
from thermal processes	1,805.0	928.8	493.0	1,369.6	750.6	5,061.6
Used oils and liquid fuels	139.7	262.5	142.5	11.9	30.4	53.3
packaging and packaging waste; absorbent, polishing, filtering and protective clothing	2,817.8	6,100.6	4,433.1	36,724.1	29,213.2	59,852.2
from construction and demolition (including earth excavated from contaminated pits)	6,208.4	13,185.8	20,937.6	168.6	421.0	11,974.5
from medical or veterinary assistance activities and/or related research	8.5	552.3	663.3	540.1	1,014.6	689.0
municipal waste (household waste from commerce, industry and institutions), including separately collected fractions	49,898.1	68,324.6	53,906.4	31,966.0	46,505.2	26,925.3
others	26,364.6	23,380.9	46,068.7	3,519.9	9,190.8	4,657.8

Source: National Bureau of Statistics

In the last 10 years, there has been a constant increase in the quantities of imported plastics and **plastic waste** generated, most of which (over 90%) being disposed of by landfilling mixed with household waste. Consequently, in addition to intense environmental pollution, there is also an increased impact on public health, especially due to single-use products made from a wide range of plastics to which various additives are added. If out of a total of 353 million tons of plastic waste generated in 2021 globally, 29 million tons or only 9% end up being recycled, it is more than obvious that the current system of production, consumption and waste management is a non-functional one. Precisely for this reason, one of the basic objectives of the Study is to demonstrate that recycling is not the only and far from the most effective solution in the fight against plastic waste at national level.

The generation of plastic waste depends on the use of plastics and the lifespan of the products. Figure 18 shows the average lifespan of a plastic product, which is almost 10 years, although this depends on its use. Packaging has an extremely short average lifespan (maximum 6 months), while plastics in the construction sector can be used for several decades. **Figure 18.**

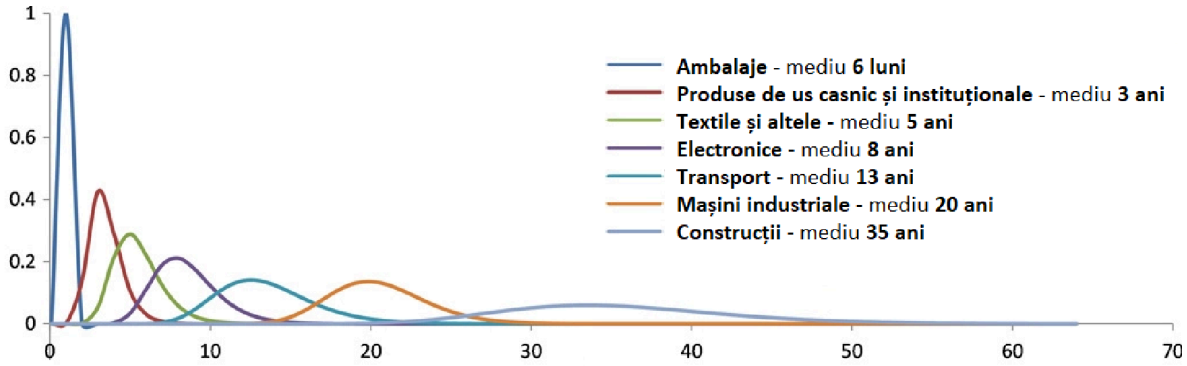

Figure 18. Average duration of plastic use – by product type

Source: Geyer, Jambeck and Law[38]

The sustainable and circular management of plastic waste depends on local capacities and regulations for each of the management stages (collection, sorting, transport, recycling, disposal, incineration, etc.). Each of these stages is organised differently in the case of underdeveloped or developing countries compared to highly developed countries. Reducing plastics can be done by optimizing product design and imposing restrictions on the import of single-use products, and reuse can be done by switching from single-use plastic products to more sustainable (reusable) plastic products, which can reduce energy consumption per consumption cycle.

Plastic waste in the Republic of Moldova on the plastics market at national level and respectively the presentation of the results for key indicators such as: the share of the Export-Import plastic market in the national GDP, quantities of imported and exported plastics by type, producers of plastic products – according to the CMEA, including territorial division and company size, etc**.** These data are important to map the current situation regarding plastic flows and respectively to correlate this data with the current plastic waste management system. The market for plastics and plastic articles, based on the export and import customs declarations of legal entities, for 2022 was about 7 billion lei **(Figure 19).** During the last 10 years analyzed, the value of the import/export market for plastics has registered a constant increase, with an average of 4% annually and 43% in 2022 compared to 2012.

Export Import Total

[38] https://www.undp.org/sites/g/files/zskgke326/files/2023-02/STUDIU%20PRIVIND%20DE%C8%98EURILE%20DIN%20PLASTIC%20%C3%8EN%20REPUBLICA%20MOLDOVA.pdf

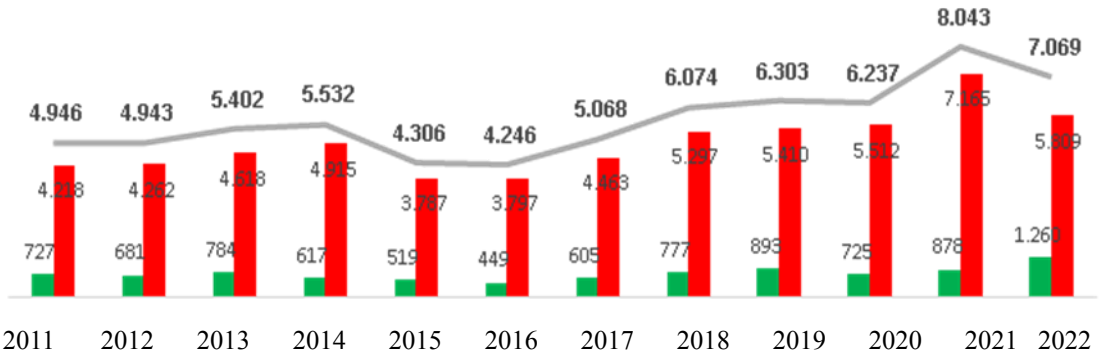

Figure 19. Value of the Export-Import market for Plastics (MDL million)

Source: National Bureau of Statistics[39]

Currently, it is estimated that annually only 3% of the plastic waste generated at national level ends up being recycled. This result is a very worrying one with gloomy prognoses in the absence of urgent intervention from central and local public authorities, the industrial sector, academia, civil society, etc.

Pollution in agriculture. Pollution in agriculture consists of the use of a wide spectrum of insecticides, fungicides, herbicides and fertilizers. In 2010–2022, insecticides were used in total from 256.6 t to 546.5 t., fungicides – total from 683.3 t to 1358.8 t), herbicides – total from 1030 t to 1,631.7 t), biological plant protection products increased significantly: from 37.6 t in 2010 to 659 t in 2022. **(Table 21).**

Table 21. Use of plant protection products in agricultural enterprises and peasant (farmer) households

Phytosanitary products	**2010**	**2015**	**2018**	**2019**	**2020**	**2021**	**2022**
Insecticides Quantity (physical weight), tons	256,6	296,8	423,9	458,6	576,6	446,6	546,5
Fungicides / Quantity (physical weight), tons	683,3	811,3	1 301,4	1 349,2	1 450,0	1 545,9	1 358,8
Herbicides Quantity (physical weight), tons	1 030,0	1 371,1	2 625,2	1 393,4	1 328,3	1 537,2	1 631,7
Biological Quantity (physical weight), tons	37,6	80,1	733,8	791,2	1 652,4	915,2	659
Other Quantity (physical weight), tons	34,4	244,5	502,1	750,3	847,7	1 182,5	1 921,6

[39] https://statistica.gov.md/ro/buletin-statistic-trimestrial-editiile-2005-2021-9877_59482.html

Source: Statistical Yearbook 2023[40]

Nutrient pollution. The reduced application of mineral fertilizers has led to improved conditions for fauna and flora in agricultural ecosystems, but leads to a reduction in the presence of humus in the soil. Although 150 kg/ha of active substance NPK and 5 t/ha of manure were introduced on agricultural land, the nutrient balance 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 extracted from the soil with the agricultural harvest. In 2013–2017, the total amount of **nitrogen** introduced into the soil was 19.2–44.3 t, phosphates – 2.9–15.9 t, potassium – 1.5–5.4 t. h. In 2022, natural fertilizers introduced into agricultural land amounted to 82,606 t. **(Table 22).**

Table 22. Chemical and natural fertilizers used in agricultural enterprises and peasant (farmer) households, in territorial profile

Total	**Chemical fertilizers**				**Natural fertilizers**			
	total, tons		on average per 1 hectare of seed, kg		total, tons		on average per 1 hectare of seed, kg	
	2021	2022	2021	2022	2021	2022	2021	2022
Total	104 676	67 893	96,9	59,9	129 812	82 606	0,13	0,08

Source: Statistical Yearbook 2023

Persistent organic pollutants and chemical waste.

In the absence of technical capacities to treat chemicals containing POPs at the national level, obsolete pesticides containing POPs were repackaged and transported across the country for disposal with the support of several technical assistance projects and grants. The total amount of obsolete pesticides removed between 2007 and 2022 constitutes 4420,3 tons (including 460.3 tons removed from the left region of the Dniester). The unusable pesticides detected are in solid and liquid states and in most cases are stored in polyethylene packaging, in metal and plastic containers, and in some cases they are mixed with soil. The total amount of pesticides, according to the data of the Environmental Protection Inspectorate as of December 31, 2021, constitutes 211.41 tons. The location locations are different: non-compliant warehouses, rooms managed by economic agents, rooms with and without security.

[40] https://statistica.gov.md/files/files/publicatii_electronice/Anuar_Statistic/2023/16_AS.pdf

Radioactive pollution. According to the National Agency for the Regulation of Nuclear and Radiological Activities, the negative effects on ecosystem services were established during the monitoring of radioactivity in the affected territories of the Brest region (Luninets) of the Republic of Belarus following the Chernobyl accident. Levels of **Radioactive contamination** As measured in the numerous specimens of mushrooms and berries (actively used by the local population as products were 53 000 to 230 000 Bq/kg, mostly caused by Cs137 and Sr90. This led to a high level of contamination of local people (contamination of 2850 people with Cs137 was measured)[41]. **Radionuclide migration** from soil to herbaceous plants and later in milk has been detected in a number of cases. Taking into account the above-mentioned migration and the migration of wild animals and birds, as well as the import of food products and construction materials, the risk assessment generated by nuclear and radiological accidents was taken into account in the mentioned study. In order to prevent the introduction of products polluted with radionuclides into the territory of the Republic of Moldova, an effective radiation control system was established at border crossing points. All major border crossing points have been equipped with detectors for vehicles, trains, goods and pedestrians to prevent the cross-border movement of food and other goods and materials polluted with radionuclides. An automatic remote radiological control system was placed in 5 regions of the country, being managed by the State Hydrometeorological Service.

National Strategy on Radioactive Waste Management and Action Plan for its Implementation for 2016–2027 was approved by Law no. 68/2017.

Needs and actions

Target MD7. Reducing pollution from all sources impacting biodiversity and ecosystem services

- Reducing national emissions of certain air pollutants that may have an impact on biodiversity
- Identification and designation of areas vulnerable to nitrates from agricultural sources
- Regulation of uses of persistent organic pollutants that may have an impact on biodiversity
- Ensuring the protection of aquatic ecosystems against nitrate pollution from agricultural sources.

[41] http://www.anranr.gov.md/en

Section 15. Resource mobilization

In the Republic of Moldova, biodiversity financing from both external and internal sources is carried out through the state budget. External financing is carried out through projects, including those included in the annex to GD no. 246/2010 on the application of tax and customs facilities related to the implementation of ongoing technical and investment assistance projects, which fall under the scope of international treaties to which the Republic of Moldova is a party, as well as other projects implemented by LPAs, NGOs and other institutions.

The main measures and actions planned for 2024-2026 in accordance with the provisions of the Government Decision on the approval of the Medium-Term Budgetary Framework (2024-2026) no. 408 of June 21, 2023, including in the field of biodiversity protection and conservation are:

- rehabilitation of water basins and flood risk management, which involves the repair and maintenance of 17 protection dams, especially in Stefan Voda, Cahul and Hincesti districts;

- implementing projects in the field of environmental protection, climate change and sustainable management of natural resources by granting grants from the National Environmental Fund in order to make the producer responsible in the field of waste;

- the preparation of waste management projects in three regions, which will include the modernization of regional solid waste management facilities (construction of three regional landfills for solid waste) and which aims to reduce non-compliant landfills as well as increase the recycling rate;

- carrying out the activities of fish breeding of natural aquatic fish objectives by breeding fish seedlings and releasing them into large rivers;

- conservation and sustainable management of wetlands with a focus on areas of high natural value in the Prut river basin.

Thus, in accordance with the provisions of the national legal framework, annually, the budget planning process takes place on the basis of the Medium-Term Expenditure Strategy for a period of 3 years, which is part of the elaboration of the Medium-Term Budgetary Framework (MTBF). In accordance with the provisions of the Government Decision on the approval of the Medium-Term Budgetary Framework (2024-2026) no. 408 of June 21, 2023, the Medium-Term Budgetary Framework (MTBF) 2024-2026 – is reflected in the Subprogram "7005 - Protection and conservation of biodiversity".

The main activities of the sub-programme and medium-term expenditure are represented in the following **Table 23**:

Table 23. Main activities of the sub-programme and medium-term expenditure

Activities	2024 (LEI/EUR)	2025 (LEI/EUR)	2026 (LEI/EUR)
Ensuring the current activity of budgetary authorities/institutions (Ministry of Environment)	2000.0/106.2	2000.0/106.1	2000.0/106.2
Projects financed from external sources (Project "Integrated management system for the conservation and sustainable use of biodiversity and equitable sharing of benefits resulting from the use of genetic resources", Project "Conservation and sustainable management of wetlands with a focus on areas of high natural value in the Prut river basin")	10 612.0/563.6	8165.0/433.6	6800.0/361.1
National Environmental Fund (revenues come from the environmental pollution system/polluter pays, penalties for illegal actions and authorizations for taxes for the use of natural resources	21922.5/1164.2	21922.5/1164.2	21922.5/1164.2
Total subprogram 7005	34534.5/ 1834.0	32087.5/ 1704.1	30722.5/ 1631.6

Source: (CBTM) 2024-2026

According to the information presented in the table above, which represents a forecast of the expenditure needs for the next 3 years, it is observed that in 2026, for the "Protection and Conservation of Biodiversity" Program, 3.8 million lei less will be allocated than in 2024, which represents a decrease in biodiversity financing from the state budget.

By Law no. 418 of 22-12-2023 of the state budget for 2024, in the chapter State budget expenditures according to the functional classification, thousands of lei for Environmental Protection provides for financial means in the amount of 604525.1 thousand lei, being proposed to be distributed as follows (**Table 24)**:

Table 24. State budget expenditures according to functional classification, thousand lei, year 2024

Environmental protection	05	604525,1

Waste collection and destruction	051	139618,5
Protection against environmental pollution	053	205231,5
Protection of biodiversity	054	34300,5
Applied scientific research in the field of environmental protection	055	118256,1
Other environmental services not assigned to other groups	056	107118,5

Out of the amount of 604525.1 thousand lei, only 34,300.5 thousand lei are allocated for Biodiversity Protection and Conservation (which is only 5.6% of the total amount allocated for Environmental Protection). The gradual increase is observed in the following **Table 25**:

Table 25. Gradual increase in planned budgetary means for biodiversity for the period 2022-2024

Title Programme/ subprogramme	2022 thousand MDL	2023 thousand MDL	2024 thousand MDL
Protection and conservation of biodiversity	17668,9	32948,3	34300,5

In the period 2022-2024, out of the total of 84917.5 lei, estimated for the period 2022-2024, the respective means were allocated from the state budget (National Ecological Fund/ National Environmental Fund) and from external sources to finance activities related to the protection and conservation of biodiversity.

Thus, the National Ecological Fund (FEN), initially created by the Decision of the Government of the Republic of Moldova no. 988/1998 in accordance with the Law on Environmental Protection (no. 1515/1993), was subsequently reformed into the National Environmental Fund (FNM), its activity being regulated by the following two acts:

- Law no. 1515/1993 on environmental protection, in this case, chapter VIII entered into force on 25.04.2022.

- Government Decision no. 711/2022 on the approval of the Regulation on the administration of the National Environmental Fund, in force since 04.11.2022 entered into force on November 4, 2022 and radically changed the way in which the financing from the FNM works, compared to the old Regulation on the functioning of the National Ecological Fund (H.G. 988/1998 repealed).

The National Environment Fund (NMF), for the time being, is the only government instrument that can be used to accumulate additional means for financing activities in the field of biodiversity. The way of regulating the activity of the FNM, in terms of the protection and conservation of biodiversity, is incomplete and insufficient, a conclusion based on the fact that the statistics of the last ten years, which show that less than a percentage of the means allocated for environmental protection through the National Environmental Fund have been used in the field of biodiversity management, which is practically insufficient.

Similar situations are also attested for:

According to the data taken from the Report on the execution of the state budget in 2022[42], financial means in the amount of 55.7 million lei were provided from the National Ecological Fund (currently the National Environmental Fund) for environmental protection, being executed in the amount of 33.4 million lei or at the level of 60.0% of the provisions, and in the field of Protection and conservation of biodiversity, being capitalized: 21.1 mil. lei for reconstruction/regeneration works of the Lower Prut Nature Reserve; 7.9 million lei for national afforestation activities of the forest fund and green spaces; 0.5 million lei for the rehabilitation of the Botanical Garden, as a result of natural disasters.

For expenditures within projects financed from external sources, allocations in the amount of 29.1 million lei were provided, the resources consisting of: grants – 13.6 million lei, (executed in the amount of 8.6 million lei), external loans – 11.0 million lei and balances at the beginning of the year in the project accounts – 4.5 million lei. In the field of biodiversity, expenditures are executed within the Project "*Integrated management system for the conservation and sustainable use of biodiversity and equitable sharing of benefits resulting from the use of genetic resources",* executed in the amount of 0.5 million lei or at the level of 42.7% of the provisions.

According to the data taken from the Report on the execution of the state budget in 2023[43], from the National Environmental Fund (FNM), for environmental protection, financial means in the amount of 81.9 million lei were approved, which

[42] https://mf.gov.md/ro/trezorerie/rapoarte-privind-executarea-bugetului/rapoarte-anuale
[43] https://mf.gov.md/ro/trezorerie/rapoarte-privind-executarea-bugetului/rapoarte-anuale

were later reduced to 17.3 million lei, of which 10.8 million lei were transferred to the grant beneficiaries or at the level of 62.1% of the provisions, in the field of biodiversity being capitalized 2.4 mln. lei for 4 projects in the field of biodiversity conservation.

For expenditures within projects financed from external sources, allocations in the amount of 17.2 million lei were provided, the resources being: grants – 16.2 million lei, external loans – 2.0 million lei and changes in cash balances – (-1.0) million lei. The expenditures were made in the amount of 9.9 million lei or at the level of 57.6% of the provisions, and in the field of biodiversity through the prism of the Project "*Integrated management system for the conservation and sustainable use of biodiversity and equitable sharing of benefits resulting from the use of genetic resources" was* executed in the amount of 1.8 million lei or at the level of 58.5% of the provisions.

The available public information, including the percentage share revealed above, determines the need to develop another functional mechanism that would ensure a more positive dynamic for supporting biodiversity, which requires significant financial resources, necessary to ensure the improvement of biodiversity financing in accordance with the international legal framework to which Moldova is a party, and the listed reports attest that biodiversity conservation was based on disparate financing from external funds, without streamlining their use through coherent coordination at central level, without special allocations from the state budget and without efforts to develop internal financial instruments complementary to external sources.

This aspect requires the Republic of Moldova to align itself with the Convention on Biological Diversity and its protocols, to which it is a party, with other relevant international obligations, taking into account national circumstances, priorities and socio-economic conditions.

Thus, taking into account that the main source of biodiversity loss is insufficient financial capacity, Target 19 of the Convention provides: Substantially and progressively increase the level of financial resources from all sources, in an efficient, timely and easily accessible manner, including domestic, international, public and private resources, in accordance with Article 20 of the Convention, for the implementation of national biodiversity strategies and action plans, by 2030.

Moreover, the priority actions included in the National Action Plan for the accession of the Republic of Moldova to the European Union for 2024-2027 (Chapter 27. Environment and Climate Change) - also requires the identification of a new mechanism for financing biodiversity, and in the context of the provisions of the regulatory framework that provides for the administration of the FNM, some changes

are to be initiated by establishing a mechanism for gradual, progressive increase in the volume of financial resources from all sources, domestic and international, public and private in order to align their financial flows with the global framework for biodiversity, and this can be achieved through the creation and development of the National Biodiversity Fund, which would provide the targeted sector with greater certainty and importance in distributing financial means in order to ensure the conservation and protection of biodiversity.

Needs and actions

MD19 target: Mobilize dedicated financial resources exclusively for biodiversity conservation

- Improvement/elaboration of the institutional, administrative and operational regulatory framework regarding the provision of adequate financial resources from all sources (national, private and international) necessary to ensure an efficient management of biodiversity in order to carry out the activities according to the GNP
- Developing/identifying financing schemes (through partnerships) according to the green economy principle by empowering economic agents (social and environmental responsibility).
- Optimal economic model for the transition of the Moldsilva Agency from the current self-financing mechanism to sustainable financing
- Identification of additional financial resources from sources of public finance, private business, local authorities that are necessary for biodiversity conservation measures
- Biodiversity compensation mechanisms, as well as a training programme to strengthen the expertise of central authorities in the effective planning, implementation and monitoring of compensatory measures
- Identification and application of governmental and non-governmental, private and international funding (European, regional and global). Mobilization of qualified human resources and volunteers.

Section 16. Digitalisation, information exchange and monitoring

According to the Kunming-Montreal Global Biodiversity Framework, the identification, development and provision of information with technical support is required to help encourage and support other biodiversity-related conventions,

multilateral environmental agreements, international organizations and other relevant programs.

Biodiversity monitoring

Biodiversity monitoring consists of tracking over time changes in the structure and functioning of ecosystems, habitats and/or populations of some species as a result of the implementation of a program or set of actions. At the same time, monitoring the condition of the objects of the plant kingdom, keeping their records and cadastre and monitoring the processes and phenomena taking place in the animal world is a requirement provided by the Law of the Plant Kingdom no. 239/2007 and the Law of the Animal Kingdom no. 439/1995.

According to Law no. 239/2007 of the plant kingdom**,** it is necessary to **Keepers state record of the objects of the plant kingdom** for establishing their quantitative and qualitative indices, their volume, type and mode of use, as well as the Cadastre of objects of the plant kingdom, which represents a register of data on the spread and distribution of objects of the plant kingdom by categories of land or aquatic objectives. The monitoring of the plant kingdom, as part of the integrated ecological monitoring, is a system of observation of objects of the plant kingdom and habitats, of evaluation and forecasting of their changes in order to preserve biological diversity.

Provisions Law no. 439/1995 of the animal kingdom stipulates the necessity of young **state record of the resources of the animal kingdom**. The state record keeping of animals and their use is carried out by:

- Research institutions, subordinated to the State University - rare, endangered and vulnerable animals, animals useful for agriculture and forestry, animals that are important for scientific research;
- Society of Hunters and Fishermen of Moldova - of game animals, other animals living in the hunting grounds of the hunting fund, assigned to the society.

The state cadastre of the animal kingdom, which contains all the information about the area, herd, places of living and reproduction of animals and their use, is drawn up over a period of 10 years by the Academy of Sciences of Moldova on the basis of the state record of animals.

Hunting arrangement of the State Forest Fund is organized by the Central Forestry Authority and is carried out every 10 years at the same time as the forest management expedition.

National Forest Inventory is regulated by the Forestry Code no. 69/2024 as a tool for assessing national forest resources, aligned with European standards, in order to obtain updated information on the state and evolution of forest vegetation throughout the country.

The increased concerns in recent years regarding the protection and conservation of fauna and flora species and natural habitats in the Republic of

Moldova, as well as the alignment of legislation with EU requirements, require consideration of permanent biodiversity impact assessment for a wide range of projects and economic activities. Thus, in accordance with recent changes associated with **the impact assessment procedure**, it is necessary for the Environment Agency to implement **the biodiversity assessment mechanism** in accordance with Chapter III/, Articles 108-1012 of Law no. 86/2014 on environmental impact assessment. The biodiversity assessment procedure is an integral part of the development approval procedure for planned activities which, separately and/or in combination with other existing and/or approved activities, may have a significant impact on Emerald sites and which are not directly related to or resulting from the management of those sites. The procedure for assessing the biodiversity of the planned activities is carried out by the Environment Agency pursuant to art. 5 letter g) of Law no. 86/2014.

Biodiversity monitoring in the Republic of Moldova is carried out by specialized institutions, such as the Environment Agency, biodiversity research institutes of the State University, the Institute of Forestry Research and Management (ICAS), scientific reserves and is carried out at different levels: at local level (e.g. tracking changes in the size or spatial extension of a population or its conservation status), (tracking changes in the structure and functioning of biocenoses). The monitoring programs can be composed on the structure of the requirements of the regulatory acts (Environmental Agreement, Environmental Permit, Environmental Permit, etc.) or they can be structured to meet project requirements.

Currently, biodiversity monitoring in the Republic of Moldova is carried out by scientific institutions in the process of implementing scientific projects. An institution specialized in this field does not exist. The "*National Authority for Meteorology and Environmental Monitoring" is in the process of* being established, which pursues the goal of unifying all functions of monitoring environmental factors, producing, managing and analyzing data in the environmental sector in order to reduce duplication, dispersion of efforts, fragmentation and inefficiency in this process. The mission of the Public Institution is to organize the activity of the integrated environmental monitoring system and the integrated environmental information system, ensuring meteorological and hydrological monitoring and the quality of environmental factors, data management and the provision of information on weather, climate, state of environmental components and natural resources in order to protect the life, property and sustainable development of the country. Biodiversity monitoring will be provided by the *Biodiversity Data and Information Management Service* within the mentioned institution.

Biodiversity monitoring is not only a legal requirement but also a basic obligation of those **economic activities** developed in the spirit of social and environmental responsibility. Monitoring and **assessing the impact** of production companies requires transparent disclosure of their risks and dependencies on biodiversity. Most businesses in the Republic of Moldova depend in some way on biodiversity, using business practices with an impact on biodiversity. In this context,

companies are required to regularly assess and disclose these dependencies, impacts and risks. An important role is to provide consumers with information on the impact of production practices on biodiversity, this is done with the aim of creating conditions through which consumers could request consumer products with less impact on biodiversity.

Among the most important monitoring programs are:

- *The monitoring system for invasive alien species* is at an early stage, largely focused on monitoring and combating *Ambrosia* and *Acer negundo species*.

- *The Forest Monitoring and Protection Center of the "Moldsilva" Agency* ensures the monitoring and plant protection measures for forest ecosystems.

Silvopathological monitoring is a system of surveillance, collection, analysis and continuous use of information about the sanitary and pathological state of forests for the purpose of forecasting, timely planning decisions and implementation of forest protection measures.

Forest protection works are carried out to prevent attacks caused by diseases and pests and comprise a complex of rules, methods and technologies used in order to increase the resilience of forest massifs, forest nurseries, forest plantations and crops, forest products and other objects of forest management and their protection from diseases and pests. The main activities are focused on technical, quantitative and qualitative aspects:

- analysis and forecasting of the development, spread of pests and diseases in the forests managed by the "Moldsilva" Agency;
- assessment of the density of populations of defoliating pests and their status on the permanent sample areas in the forests managed by the "Moldsilva" Agency;
- phytosanitary examination of forest nurseries managed by the "Moldsilva" Agency;
- providing advisory assistance in carrying out preliminary and integral research in the forests managed by the "Moldsilva" Agency;
- phytosanitary examinations in the stands degraded and/or affected by mass drying within the town halls and other holders.

Forest monitoring is a system of continuous surveillance on changes in the health status of forest vegetation as a result of pollution of the atmosphere and soil, logging, recreational uses, etc. This system is part of the major concerns manifested at global, European and national level of surveillance and conservation of forest resources. In order to carry out forest monitoring, the research is carried out in included programs of 2 levels of different intensity:

Level I – supervises the condition of the crown of the tree, assessments of the condition of the soil, of the leaf nutritional status of the trees, the diversity of soil vegetation and general information about living trees and dead wood at irregular intervals;

Level II – intensive forest monitoring is key to providing insight into the cause-and-effect relationships between the state of forest ecosystems and various stressors such as air pollution and drought.

Level I is a large-scale (national and continental) monitoring of forest status, based on the national (2 x 2 km) and European (16 x 16 km) networks of permanent surveys, with a lower intensity of assessments. Currently, at the level of the national network, a number of 618 permanent surveys are located within the forestry entities subordinated to the "Moldsilva" Agency, and at the level of the European network – 12 permanent surveys.

Level II represents an intensive surveillance of the state of forests, with special reference to the impact of pollution on the main forest ecosystems, being made up of 12 surveys arranged unsystematically, with a higher intensity of assessments. Level II of intensive surveillance of the state of forests is not currently applied in the Republic of Moldova.

In the Republic of Moldova, **the European Forest Monitoring Network** has been operating since 1992, the national network since 1993, and the placement of the first surveys (six in number) of intensive monitoring started in 1996. **The Forest Health Surveillance and Inventory System of the National Forest Fund** (FFN) is also part of the major concerns expressed at European and global level for the surveillance and conservation of forest resources. These concerns are embodied in the provisions of resolutions 1 and 6 of the Strasbourg Ministerial Conference (1990), of Agenda no. 21 in Rio d'Janeiro (1990) and the Helsinki Ministerial Conference (1993).

The Agricultural Cadastre Information System aims to computerize especially agricultural producers (farmers), but also public authorities at all levels. The exposed solutions have features of modern agriculture by analyzing the factors that drive the development and implementation of food security, the need to implement modern methods of agricultural land management, including agricultural subsidies, the need to know the quality of the agricultural land fund, etc. The digital maps of the Agricultural Information System contain information from agricultural activities regarding: Agricultural enterprises, Crop distribution; Crop harvesting, Farms and livestock, Soil map of the Republic of Moldova, Educational and research institutions in the field of agriculture[44].

The National Bureau of Statistics of the Republic of Moldova is an important source of data for biodiversity assessment. The database contains annual data and information on forest fund, hunting fund, protected areas, air pollution and water use.[45]

The Society for the Protection of Birds and Nature (SPPN) is a non-governmental and non-profit organization, whose mission is to promote the

[44] https://geoportalinds.gov.md/en/geoportalhome-2/
[45] http://statbank.statistica.md/pxweb/pxweb/ro/10%20Mediul%20

protection of the environment in general, and of wild bird species in particular, as well as their habitats, through scientific monitoring and conservation efforts is focused on the study and protection of wild bird species in the Republic of Moldova, their habitats and biodiversity. [46]

Digitalization

The digitalisation of biodiversity conservation is an important part of the green transition to ensure access to data, informed decision-making, data sharing and data harmonisation between sectors and with the European data management system. It includes monitoring and data management, Geographic Information Systems (GIS), Satellite imagery, remote sensing technologies, threat detection, etc. However, digital infrastructure is insufficient and inadequate in the field of forest management and biodiversity monitoring, protected areas, due to limited technical capacity and financial resources, which hamper the development and maintenance of digital tools and platforms for biodiversity management (biodiversity information system). The Moldova European Development Strategy 2030 stipulated in art. 5.3. The e-transformation of government, society and the economy must promote the full digitisation of public services. Mandatory interconnection and interoperability, ensuring access to administrative data sources for all authorities.

In Moldova, specific information on digitalisation directly related to biodiversity is limited. Integrating existing government digital platforms and strategies into biodiversity management would be a step forward, building on the country's overall digital progress to address access to information, knowledge management, innovations, and scientific data as specialized needs in environmental and forest management.

Data management is partially carried out by the Moldsilva Agency, and in particular - data management of the forest fund, protected areas, by the Environment Agency - environmental quality monitoring, integrated environmental information management, by the Forestry Research Institute (ICAS) - forest management, data management and planning. Existing technical and digital resources are not enough. There is a management planning review system for forest areas included in the state forest fund, which has been reviewed regularly for 10 years. However, data management for forest restoration, monitoring and reporting are not digitized and accessible online.

The digitalisation **of species data management** , including rare Red Book species and Emerald species and habitats, forest ecosystems, as well as protected areas, will help with data collection, long-term monitoring and reporting processes that will ensure informed decision-making, communication, research, societal

[46] https://sppn.md/ce-facem/activitati/programe-de-monitorizare/

participation, integration into EU data management systems, the compensation mechanism and reporting to EU Related.

Public information and awareness

In the Republic of Moldova**, public information and awareness actions** on the importance of biodiversity conservation were organized in the context of global events included in the calendar of environmental events. The Ministry of Environment and its subdivisions, the "Moldsilva" Agency, the State University and the subordinate Institutes organized and participated in various actions dedicated to national and international environmental events such as: International Day of Biodiversity, Earth Hour, Bird Day, National Day of Greening of the Plain "A tree for our survival", International Day of Forests, World Day of Wetlands, World Environment Day, World Water Day and Researchers' Night.

The process of informing and raising awareness of environmental issues is supported by government organizations through official web pages, Facebook, and other social platforms. The most active social innovation is developed and maintained by NGOs, such as EcoContact, the Biotica Society, the Society for the Protection of Birds and Nature, the National Environment Center, EcoTiras, etc. The titles of the campaigns differ, but they urge the population to join joint actions for conservation and protection of biodiversity, such as: National Forest Plantation Campaign, Waste-Free Forest, Bird Protection, etc.

Needs and actions

Target MD 20. Capacity building and development, technology transfer and technical and scientific cooperation for implementation

- Creation of the Integrated Biodiversity Information System (Species, flora, fauna, rare species, invasive alien species, protected areas, forest fund, Emerald Network)
- GIS mapping and Cadastre of Species, flora, fauna, rare species, alien invasive species, genetic resources, gene banks, protected areas, forest fund, Emerald Network and their connection with specialized cadasters or Cadastre of real estate.
- Improving and strengthening the Monitoring system of biological resources based on scientific research, information transfer and knowledge on biodiversity, available to decision-makers and other relevant actors.

MD Target 21: Information and data available for sound conservation decision-making

- Monitoring biodiversity data, information and knowledge available to policymakers and other relevant actors to support policies in planning and decision-making, review and reporting on implementation progress.
- Popularizing and disseminating scientific results in the field of biodiversity conservation in a form accessible to society
- Developing information and awareness programs on biodiversity for personnel involved in industry and other fields of activity, in order to understand the value of biodiversity that contributes to the well-being of the population
- Strengthen the transfer of information, the transfer of the latest spatial data and information on biodiversity between scientific actors and nature conservation institutions, as well as specialists involved in conservation management and other relevant sectors. (UNBIOLAB)
- Clearing house mechanism (CHM, BCH, ABS CH) of the Convention on Biological Diversity and its protocols, established in accordance with Article 18.3 of the Convention.
- Creation of national information exchange pages through the BIOLAND application, accessible for the decision-making process and for the general public
- Establish a short- and medium-term training mechanism on sensitive aspects of biodiversity for decision-makers, operators, users of biological resources, NGOs, other stakeholder groups, the general public.
- Curriculum development of educational programs in schools, universities and communities.

Section 17. Research, innovation and development

Knowledge Management For the biodiversity sector, it is an important component of the ecological transition that requires innovative solutions to modernise countries' economies and societies and ensure their sustainable future.

According to **administrative reform** Recent from **the academic sector**, research and development projects and programmes have been revised to ensure strategic priorities and commitments in the field of nature conservation and biodiversity. However, there is quite little progress in the scientific community to provide innovative solutions and knowledge management to support the ecological transition, in particular for ecosystem reconstruction, biodiversity conservation, ecosystem-based adaptation, etc. Experienced non-governmental organisations are

usually more flexible in terms of research and innovation solutions for the green transition.

The national environmental strategy and biodiversity policy involved specific directions of activities related to **Research & Development**. However, there is a weak link between research and innovation focused on the green transition in specific national policy documents.

The Emerald Network of Special Conservation Areas was established in accordance with Natura 2000 and the Berne Convention, with the aim of protecting vulnerable species and habitats of European importance. It is important for the Government to increase its infrastructure and institutional capacities in order to have access to European and international funds intended for biodiversity conservation, nature restoration, including research programs such as Horizon 2020, the LIFE Programme, INTERREG Europe, the Black Sea Programme, ENPI, etc.

Existing innovations in the biodiversity sector are mainly related to GIS mapping of PAs, the forestry sector and the Emerald Network. Nature-based solutions are applied in certain protected areas and ecosystems. The clarification mechanism and planning of forest management is based on the digital database system. However, in Moldova the bioinformation monitoring system is poorly developed, and does not ensure complete digitization and compatibility and access to information. As regards technical barriers, it was found that there are no platforms for sharing biodiversity data, making it difficult to access and use information in this area.

Activities and measures in the biodiversity sector, in particular in the area of biodiversity protection and conservation and forest management, are closely linked to several thematic areas, demonstrating the interconnected nature of these sectors with broader environmental and socio-economic priorities.

The Republic of Moldova is home to globally important populations of birds, fish, mammals, invertebrates, plants and fungi in a wide range of land and freshwater areas. Through **Research and monitoring**, the Republic of Moldova aims to maintain a balance between human activities and the conservation of endangered species, ensuring their survival for future generations. A number of scientific publications, textbooks, brochures, newsletters, etc., addressed to a wide audience, including academia, civil servants, policy makers, students, pupils, children, the general public and women on the topic of biodiversity conservation have been published and disseminated lately.

The main scientific institutions that develop **research** in the field of conservation of plant and animal diversity are: the research institutions within the State University of Medicine and Pharmacy (Institute of Zoology, Institute of Ecology and Geography, Institute of Genetics, Physiology and Plant Protection), the Institute of Forestry Research and Planning, the National Botanical Garden (Institute) "Alexandru Ciubotaru" of the State University of Moldova, the Scientific Reserves "Codrii", "Plaiul Fagului", "Prutul de Jos" and "The Princely Forest". In recent years, research institutions have focused on the following research problems:

Institute of Zoology of the University of Moldova [47]

- *Assessment of the status of animal species, elaboration of the list of species with rarity status and the algorithm for their presentation in the fourth edition of the Red Book of the Republic of Moldova;*
- *Eutrophication processes of the Dubasari reservoir under climatic changes;*
- *Assessment of the structure and functioning of the animal world and aquatic ecosystems under the influence of biotic and abiotic factors in the context of ensuring ecological security and well-being of the population;*
- *Evolutionary changes of economically important terrestrial fauna, rare and protected species in the conditions of anthropogenic and climatic changes*
- *Determining changes in the aquatic environment, assessing migration and the impact of pollutants, establishing the laws of the functioning of hydrobiocenoses and preventing adverse consequences on ecosystems*
- *Creation of an innovative cross-border monitoring system of the transformations of river ecosystems in the Black Sea basin under the impact of hydropower development and climate change Monitoring and safeguarding of habitats*

The "Alexandru Ciubotaru" Botanical Garden (Institute) of the University of Moldova[48]

- *Evaluation of the status of plant and fungal species, elaboration of the list of species with rarity status and the algorithm of their presentation in the fourth edition of the Red Book of the Republic of Moldova*
- *Pan-European Network for the Restoration and Reforestation of Climate-Adaptive Forests;*
- *Metabolism of trace metals in plants;*
- *Drylands Facing Change: Interdisciplinary Climate Research; change, food insecurity, political instability;*

Institute of Forestry Research and Planning[49]

- *Research in the field of floristic diversity in forest ecosystems (in protected areas) located in the State forest fund*
- *Assessment of the health status of forests in the Republic of Moldova based on forest monitoring data for the period 1993-2015*
- *The current phytosanitary status of the stands within the forest fund of the Republic of Moldova is largely determined by the structure and composition of the stands, their origin and the evolution of silvopathological factors. In turn, the evolution of silvopathological factors is influenced and correlated by the characteristics of local ecological factors, which in our conditions have a pronounced climatic character.*

Institute of Ecology and Geography of the University of Moldova[50]

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[47] https://zoology.md/proiecte-de-cercetare

[48] https://gbni.usm.md/?page_id=846

[49] https://icas.com.md/activitati-2/cercetare/

[50] https://ieg.md/programe-si-proiecte-de-cercetare

- *Spatio-temporal modelling of abiotic environmental factors for estimating the ecological stability of landscapes*
- *Assessing the stability of urban and rural ecosystems for sustainable development*
- *Elaboration of the Cadastre of objects and complexes from the fund of natural areas protected by the state.*
- *Integrated assessment of the anthropogenic impact on representative ecosystems for the purpose of conservation and extension of State Protected Natural Areas in the context of the requirements of the EU Directives.*

Faculty of Biology and Geosciences of the University of Moldova [51]

Invasive and potentially invasive alien plant species in the "ORHEIUL VECHI" Cultural-Natural Reserve.

At the same time, the state provides funding from the state budget for the implementation of the following projects by the research institutions within the USM (Institute of Zoology, National Botanical Garden (Institute) "Alexandru Ciubotaru"), as well as the Institute of Genetics, Physiology and Plant Protection:

- Eutrophication processes of the Dubasari reservoir under climatic change conditions;
- Assessment of the structure and functioning of the animal world and aquatic ecosystems under the influence of biotic and abiotic factors in the context of ensuring ecological security and well-being of the population;
- Genetic and biotechnological approaches to agroecosystem management under climate change;
- Expanding and preserving genetic diversity, improving agricultural crop genofunds in the context of climate change;
- Identification of valuable forms of plant resources with multiple utility for valorization in the circular economy;
- Development of environmentally harmless means to reduce the impact of harmful organisms of agricultural crops against the background of climate change;
- Ex situ and in situ research and conservation of plant diversity in the Republic of Moldova;
- Assessment of the structure and functioning of the animal world and aquatic ecosystems under the influence of biotic and abiotic factors in the context of ensuring ecological security and well-being of the population.

At the same time, the National Environment Fund allocates financial resources for the implementation of the project *"Assessment of the status of plant, fungal and animal species, elaboration of the list of species with rarity status and the algorithm for their presentation in the fourth edition of the Red Book of the Republic of Moldova"*

[51] https://oaji.net/articles/2022/2052-1671543960.pdf

Human resources serving the biodiversity sector are not sufficiently qualified and prepared to support the ecological transition. Knowledge management is not a direct subject of master's/doctoral programs in the research and development sector of universities and research institutions. However, a few research projects and educational programmes partially support biodiversity conservation and restoration objectives. A number of EU environmental programmes tangently support vocational training and research in line with the Kunming Montreal Global Biodiversity Framework.

Experienced non-governmental organizations are usually more flexible for research and innovation solutions. Existing innovations in the biodiversity sector are mostly related to GIS mapping of Protected Areas, mapping of the forest sector and the Emerald Sites Network, the provision of the Bird Index list. The current process of social innovation in the field of biodiversity is supported by government organizations through official websites, Facebook and other social platforms. The most active social innovation is developed and maintained by NGOs such as EcoContact, Biotica, Society for the Protection of Birds and Nature, Forestrywomen, etc. The national campaign on forest planting, waste-free forests, bird protection, etc. are organized regularly.

Private **and third sector actors** are involved in research and innovation in the thematic area of biodiversity. Thus, the NGO Biotica and the NGOs of the EcoTiras Association offer general presentations and scientific publications on nature conservation, biodiversity, river ecosystems, etc. Provide scientific arguments for the inclusion of new areas in the list of protected areas. Development of management plans for Emerald networks and APs. The Society for Birds and the Protection of Nature provides the list of the bird index.

Needs and actions

Target MD 20. Capacity building and development, technology transfer and technical and scientific cooperation for implementation

- GIS mapping and Cadastre of Species, flora, fauna, rare species, alien invasive species, genetic resources, gene banks, protected areas, forest fund, Emerald Network and their connection with specialized cadasters or Cadastre of real estate.
- Improving and strengthening the Monitoring system of biological resources based on scientific research, information transfer and knowledge on biodiversity, available to decision-makers and other relevant actors.
- Identification and description of habitat types found on the territory of the Republic of Moldova in accordance with the EU Habitats Directive

MD Target 21: Information and data available for sound conservation decision-making

- Monitoring biodiversity data, information and knowledge available to policymakers and other relevant actors to support policies in planning and decision-making, review and reporting on implementation progress.
- Popularizing and disseminating scientific results in the field of biodiversity conservation in a form accessible to society
- Strengthen the transfer of information, the transfer of the latest spatial data and information on biodiversity between scientific actors and nature conservation institutions, as well as specialists involved in conservation management and other relevant sectors. (UNBIOLAB)
- Clearing house mechanism (CHM, BCH, ABS CH) of the Convention on Biological Diversity and its protocols, established in accordance with Article 18.3 of the Convention.
- Creation of national information exchange pages through the BIOLAND application, accessible for the decision-making process and for the general public

CHAPTER II
GENERAL OBJECTIVE AND SPECIFIC OBJECTIVES OF THE FIELD OF ACTIVITY

The Biodiversity Programme for the years 2024-2030 reflects the commitment of the Republic of Moldova under the multilateral environmental agreements to which the country is a party, being a policy framework document that, through specific objectives and outlined actions, aims to reduce pressures on biodiversity, protect and restore ecosystems and stimulate profound changes to reverse the trajectory of biodiversity loss.

The program aims to achieve the general goal and specific objectives, as follows:

General purpose

The programme has the general aim of conservation and sustainable use of terrestrial ecosystems, sustainable forest management, combating desertification, restoring degraded land and soils, including land affected by desertification, drought and floods, developing green infrastructure, conserving and protecting wetlands, ensuring ecosystem conservation, supporting research in the field, sustainable forest management, eliminating abusive deforestation and logging transition to a circular economy.

Vision of the development of the field of biodiversity conservation towards 2050

As a vision of the development of the field of biodiversity conservation towards 2050, it aims to guarantee a high level of protection and restoration of biodiversity, the only way to preserve the quality and continuity of human life.

Purpose of the Program

The purpose of the Programme is linked to the Kunming-Montreal Global Biodiversity Framework and states "*By 2030, take urgent action to halt and reverse biodiversity loss to put nature on the path to recovery for the benefit of people and the planet by conserving and sustainably using biodiversity and ensuring fair sharing of benefits from the use of genetic resources, while providing means for implementation*".

Global Objective A - Strengthen the integrity of all ecosystems, together with increasing the area, connectivity and integrity of natural ecosystems by at least 15%, supporting healthy and sustainable populations of all species, reducing the rate of species extinction by at least 10 times, halving the risk of extinction of species from all taxonomic and functional groups, and conserving the genetic diversity of wild species, and while maintaining genetic diversity across all species to less than 90%;

Objective B - Recognize, maintain or enhance nature's contribution to human life through its conservation and sustainable use, in order to contribute to the implementation of the global development agenda for the benefit of all people;

Objective C - Fair and equitable sharing of benefits resulting from the use of genetic resources, with a significant increase in the sharing of monetary and non-monetary benefits, including for the conservation and sustainable use of biodiversity;

Objective D - Reduce the gap between the available financial means and other means of implementation and the amount of funds needed to implement the Vision for 2050.

In line with these objectives, 23 global targets have also been proposed globally, to be correlated with national targets, as reflected in **Table 26.**

Table 26. Matching national targets with global targets under the Global Biodiversity Framework

Global objectives A,B,C,D	Global targets under the Global Biodiversity Framework	National targets	National indicators
A	**Target 1. All areas are planned or managed to reduce the loss of areas of high importance for biodiversity to approach zero.**	**MD Target 1:** Ensure the institutional framework and apply effective management for the forest fund and national ecological networks	20% increase in the share of sustainably managed forests in LPAs 10 forest management of forests from the National Forest Fund (ICAS) updated 2030 84% of the forest area managed in accordance with the long-term management plans towards 2027 (text of the MS) 145 thousand ha Degree of implementation of the action plan on the implementation of the PNERP GD on the approval of the Regulation on the extension of forest areas and other categories of forest vegetation (2025) 5 management plans from the National Forest Fund updated 5% of local forests developed forest management (ICAS). Elaboration of 7 Management Plans for protected areas with legal personality (Scientific Reserves, Lower Prut Biosphere Reserve, Lower Dniester National Park). Draft Government Decision on the approval of the Framework Regulation on the Management Plan for the Emerald Network sites 10 Management Plans for Emerald Network Sites Approved Criteria/standards for the identification of PVRC in the Republic of Moldova applied Ensuring continuity of forest management for all PVRCs
A	**Target 2. 30% of degraded areas are in the process of being effectively restored**	**MD Target 2:** Ecological reconstruction of degraded ecosystems to ensure at least 10% of degraded land	Restoration/reconstruction works of degraded and inadequate stands on 16920 ha by 2027 *(PNERP)* Works to create forest curtains for the protection and afforestation of riparian strips on 12080 ha completed by 2027 *(PNERP)* Forest Protection Curtains Act approved (2025) Wetlands cover by 2027 – up to 65 km2 (text from the MS), including: The wetlands on an area of 50 ha of the Lower Prut Biosphere Reserve, 3000 ha of aquatic and marsh ecosystems from RPBJ restored, 11,000 ha of meadow ecosystems from the Pădurea Domneasca Reserve (Middle Prut) restored

Global objectives A,B,C,D	Global targets under the Global Biodiversity Framework	National targets	National indicators
A	**Target 3. 30% of the surfaces are efficiently preserved**	**MD target 3.** Expanding the areas of natural areas protected by the state up to 8% of the country's territory and ensuring their sustainable management	Number of staff involved in the management of protected natural areas Total area of state protected areas extended to 8% of the country's surface Emerald network extended to 10% 2 Emerald sites connected to Natura 2000 *(LIFE project)* Draft Government Decision on the approval of the Regulation on the manner of maintaining the Register of Emerald Network Sites *(MM Action Plan for 2024)* Developed GIS maps and Emerald Network sites integrated into the system of state protected areas (Environment Agency) and territorial planning (Geodesy, Cartography and Cadastre Agency, www.geoportal.md) Ramsar site created and approved by the Ramsar Convention (9671 ha) 3 wetlands of national importance established, total - 321.56 ha
A	**Target 4. Recovering endangered species, maintaining genetic diversity and managing human-wildlife conflict**	**MD target 4.** Protection of endangered species included in the Red Book of the Republic of Moldova	100% by 2030 updated list. Elaboration and publication of the 4th Edition of the Red Book of the Republic of Moldova The index of the list of species in the Red Book of the Republic of Moldova updated (RLI for Moldova is 0.969 in 2020, according to MS by 2027 we have 0.02%) 2 species of threatened plants, included in the Red Book, restored in-situ. (*Botanical Garden Institute of the University of Moldova)* 7 Conservation plans for threatened species included in the CR, developed within the management plans of protected areas (Emerald). 4 ecological passports of flora and 11 endangered fauna species developed *(UNDP Prut project)* Sufficiency index increased to 50% and Emerald network area expanded by 10%
C	**Target 5.Harvesting, use and trade in wildlife are sustainable, safe and legal**	**MD5 target.** The harvesting, use and trade of wildlife species is sustainable, safe and in accordance with the provisions of national legislation and the CITES Convention	Draft Government Decision on the procedure for authorizing the export and import activities of wild plants and animals of flora and fauna, their parts and derivatives, as well as the import/export or re-export of species of fauna and flora regulated by the Convention on International Trade in Endangered Species of Wild Fauna and Flora CITES Designed and functional monitoring system The proportion of illicit wildlife trade (including derived products, parts thereof) that have been poached or smuggled reduced by 30% by 2027 (text from MS) Periodic national activity reports on the export and import of wild plants and animals, their parts and derivatives, as well as on the import/export or re-export of species of fauna and flora elaborated and submitted in accordance with multilateral agreements in the field, to which Moldova is a party

Global objectives A,B,C,D	Global targets under the Global Biodiversity Framework	National targets	National indicators
A,B	**Target 6. Reducing the rates of introduction and establishment of invasive alien species by 50%**	**MD target 6.** Management of invasive alien species	Law on invasive alien species harmonised with the EU legal framework, approved National List of Invasive Alien Species of the Republic of Moldova developed/or updated (based on international and EU lists/criteria) Elaboration of the Regulation on the mechanism for limiting, controlling and eradicating invasive alien species, including emergency measures. Risk assessment system for invasive alien species created and operational Regulation on the authorization, introduction, introduction, transport and placing on the market, offering, breeding or release into the environment of pronounced invasive alien species, approved by GD Databases and monitoring system set up within the Environment Agency
A,B	**Target 7. Reducing pollution, halving nutrient losses and pesticide risk**	**Target MD7.** Reducing pollution from all sources impacting biodiversity and ecosystem services	Regulation on the reduction of national emissions of certain atmospheric pollutants approved by GD Draft Government Decision on Methodologies for Identification and Designation of Areas Vulnerable to Nitrates from Agricultural Sources Approved by GD Reformulation Approved Persistent Organic Pollutants Regulation (2024) Programme for the protection of waters against pollution by nitrates from agricultural sources by aligning national legislation and standards with Community legislation and standards, in particular Directive 91/676/EC of 12 December 1991 on the protection of waters against pollution by nitrates from agricultural sources.
A	**Target 8. Minimise the impacts of climate change and ocean acidification, including through nature-based solutions and/or ecosystem approaches**	**MD8 target.** Minimising the impact of climate change, including through nature-based solutions and/or ecosystem approaches	Reducing soil erosion processes and protecting about 350 thousand ha of agricultural land by creating/rehabilitating 10 thousand forest curtains to protect agricultural fields by 2032 *(PNERP)* Updating and revising the technical norms for forest regeneration adapted to climate change. Increasing the resilience of forest ecosystems to climate change through ecological reconstructions and forest treatments Infrastructure related to the modernized and functional logging process Commissioning of the National Center for Forest Genetics and Seminology with three regional centers for industrial growth of forest reproductive material. The overall capacity of the respective industrial centers will ensure the production of about 85-90 million seedlings annually (including about 20-30% with protected roots). Regional centers for the industrial growth of forest reproductive materials are created (3 units), technically equipped and functional Annual production of 60-65 million seedlings reached (including 40% with protected roots), for afforestation, regeneration and ecological reconstruction *(PNERP)*

Global objectives A,B,C,D	Global targets under the Global Biodiversity Framework	National targets	National indicators
A,B	**Target 9. Sustainable wildlife management benefits people**	**MD Target 9:** Sustainable management of wildlife species in the forest fund improves, providing social, economic and environmental benefits	Forest fund management plan in the context of identifying the benefits of sustainable use of wildlife developed and adopted 84% of the forest area managed in accordance with the long-term management plans towards 2027 (text of the MS) Draft Government Decision on the approval of the Regulation on the placing on the market of wood and wood products Draft Government Decision on the establishment of a FLEGT licensing regime for the import of timber Regulatory framework on the regulatory mechanism for the sustainable use of non-wood products from forests developed and approved Processing halls for non-wood products from created forests Improved turnover Elaboration of the normative framework related to the Law on Hunting and Protection of the Hunting Fund
A	**Target 10.Sustainable management of agricultural areas, aquaculture, fisheries and forestry**	**MD Target 10:** Sustainable management of agricultural areas, aquaculture, fisheries and forestry	The degree of halting the decline of the established pollinator population – by 10% Silvo-pastoral arrangements developed in order not to admit the over-exploitation of habitats and to ensure a long-term development of biodiversity on the area of 1500 ha Draft law for the amendment of Law no. 44/2022 on the production, marketing and use of forest reproductive material Projects for the establishment of 35 local forest nurseries Improved regulatory framework for fisheries and aquaculture 5000 ha of silvopastoral and agroforestry systems created and/or rehabilitated (PNERP) Up to 1.5% of the total agricultural area (the current is 1.14%) Ecolabel applied and used according to ISO 12075 standards Degree of implementation of the normative, strategic and policy framework on the fishery fund, fisheries and fish farming -100% by 2027 (MS index)
B	**Target 11. Restoring, maintaining, and enhancing nature's contributions to humans, including ecosystem functions and services**	**MD Target 11:** Restoration, maintenance and enhancement of nature's contributions, including ecosystem services in sectors of the national economy, particularly at local/community level	The study on the Evaluation of the monetary and non-monetary costs of ecosystem services carried out Improved practices on the inclusion of ecosystem services in territorial planning by accessible and accessible LPAs

Global objectives A,B,C,D	Global targets under the Global Biodiversity Framework	National targets	National indicators
B	**Target 12. Improving green (blue) spaces and urban planning for human well-being and biodiversity**	**MD12 target:** Improvement of green (blue) spaces and urban planning	Draft law on green spaces of urban and rural localities (new wording) By 2030 - 2 Emerald Networks, 3 Wetlands of international importance, integrated into the spatial planning and urban planning documentation. (National Spatial Planning Plan, Spatial Planning Plan of the Centre-North-Upper Development Region, PAT mun. Chisinau, ATU Gagauzia, and the localities on the left bank of the Transnistrian Dniester, PUGs and/or updating the documentation of spatial planning and urban planning in case of their existence. (Urban Planning and Construction Code No. 434 (art. 16 and art. 148 para(8)) of 28-12-2023) 10 Urban Plans of LPAs Elaborated/Adjusted Green spaces in urban and rural localities are created/rehabilitated on an area of 3,000 ha (from FNM 2025) Draft law amending Law no. 136/2007 on Zoos, in order to fully transpose Directive 1999/22/EC
C	**Target 13. Fair and equitable sharing of benefits from genetic resources, digital sequence information and associated traditional knowledge**	**MD target 13.** Fair and equitable sharing of benefits from genetic resources in accordance with the provisions of the Nagoya Protocol	Draft law on access to genetic resources and fair and equitable sharing of benefits resulting from their use Normative act drafted Plant genetic resources preserved in ex-situ collections made available to agricultural needs 10% increase in the number of batches of plant genetic resources held in public gene banks through collection, propagating material and seed exchange Register (Cadastre) of spontaneous plant and animal species, genetic resources, rare species, invasive species, etc., in updated digital format
B,D	**Target 14. The multiple values of biodiversity are integrated into decision-making at all levels**	**MD Target 14:** The multiple values of biodiversity are integrated into the country's sustainable development policy framework, including at the local level	Biodiversity values reflected in decision-making processes. Number of updated sectoral policy documents with provisions on biodiversity values. Biodiversity values reflected in business decision-making processes Modification of the regulatory framework (Law 435 of 2006 on administrative decentralization and Law 436 of 2006 on local public administration and other related normative acts). Normative acts at national level fully adjusted until 2026 Normative acts at local level fully adjusted by 2030 Number of biodiversity-related normative acts issued/adjusted by public authorities (at local level)

Global objectives A,B,C,D	Global targets under the Global Biodiversity Framework	National targets	National indicators
B	**Target 15. Companies assess and disclose biodiversity-related dependencies, impacts and risks and reduce negative impacts**	**MD Target 15:** Companies assess and disclose biodiversity-related dependencies, impacts and risks and reduce negative impacts	The updated national statistics system with reporting provisions on risk assessment related to biodiversity and measures to reduce negative impacts. The statistical yearbook completed with the respective statistical data published and accessible. Environment Agency updates data on biodiversity The normative framework developed 5 project evaluations: Biodiversity impact assessment procedures applied and in accordance with the provisions of Law no. 86/2014 on environmental impact assessment
A,B	**Target 16. Enable sustainable consumption choices to reduce waste and overconsumption**	**MD target 16.** Reducing pressure on biodiversity by encouraging the reduction of waste and overconsumption	Amendment of Law no. 299/2022 on food waste
A,C	**Target 17. Strengthening biosecurity and sharing the benefits of biotechnology**	**MD Target 17:** Ensure functional biosafety in accordance with the Cartagena Protocol and the Nagoya-Kuala Lumpur Additional Protocol on Liability and Compensation	Draft law on the use of genetically modified microorganisms in isolation conditions Elaboration of the regulatory framework on the use of GMOs, including microorganisms, in isolation conditions Draft Government Decision on the implementation of the provisions of Law no. 152/2022 on the regulation and control of genetically modified organisms Draft Government Decision on the approval of the Regulation on cross-border movements of genetically modified organisms Regulation on the assessment of environmental risks to the use of GMOs developed and approved by GD Increase the potential of the reference laboratory, staff trained in continuous monitoring Legal framework developed and approved Procedures in place to ensure liability and recovery
A,B	**Target 18. Reducing harmful incentives by at least $500 billion per year**	**MD Target 18:** Reducing harmful incentives for biodiversity	Draft law on the repeal of Law no. 71/2023 on subsidies in agriculture and rural areas and the approval of the Law on subsidies Draft Government Decision on the approval of the Regulation on the integrated administration and control system in the subsidy process and application of the calculation of the administrative sanction for cross-compliance

Global objectives A,B,C,D	Global targets under the Global Biodiversity Framework	National targets	National indicators
D	**Target 19. Financial resources have increased to $200 billion per year, including $30 billion through international funding**	**MD19 target:** Mobilize dedicated financial resources exclusively for biodiversity conservation	Creation of the National Biodiversity Fund and development of the institutional regulatory framework Revision of the normative framework that provides for the mechanism for financing biodiversity through the National Environmental Fund, including the related framework, elaboration and development of the legal mechanism for financing biodiversity through the National Biodiversity Fund. Normative framework in the field of public-private partnership amended. 3 public-private partnerships concluded by the state until 2030, which have as object the protection / conservation of biodiversity Application of ESG *(environmental, social, governance) principles* by economic agents and financial institutions, consistent with the provisions of the European Green Deal. Analytical report for the transition of the Moldsilva Agency from the current self-financing mechanism to sustainable financing The legal, institutional and administration mechanism of the Protected Natural Areas developed and approved, which will constitute a specialized administrative unit, as a legal personality subordinated to the public environmental authority. Analytical report with concrete recommendations to strengthen the expertise of central authorities in the effective planning, implementation and monitoring of compensatory measures Financial, human and technical resources determined and applied to achieve the objective of increasing the benefits of the use of natural resources. Increased value of financial resources (external and internal) allocated to the forestry sector, thousand lei - 1557300.0 (by 2027) – text from the MS
A,B,C,D	**Target 20. Capacity building and development, technology transfer and technical and scientific cooperation for implementation are strengthened**	**Target MD 20.** Capacity building and development, technology transfer and technical and scientific cooperation for implementation	Integrated Biodiversity Information System (Species, flora, fauna, rare species, alien invasive species, protected areas, forest fund, Emerald Network) developed, implemented and managed. Data and available information used for planning and decision-making processes GIS maps elaboration for the cadastre of Species, flora, fauna, rare species, alien invasive species, genetic resources, gene banks, protected areas, forest fund, Emerald Network. Specialized digital cadaries, elaboration, managed, functional and accessible to the public. Biological Resources Monitoring System established and accessible in the decision-making process Elaborate and accessible databases in the field of biological resources. List of habitat types developed and approved by the MM

Global objectives A,B,C,D	Global targets under the Global Biodiversity Framework	National targets	National indicators
A,B,C,D	**Target 21. Data, information and knowledge are available for decision-making**	**MD Target 21:** Information and data available for sound decision-making associated with biodiversity conservation	Scientific results in the conservation of disseminated biological diversity Number of seminars, meetings, published materials, dedicated to raising awareness and sensitization at national level on the problems caused by invasive alien species Data and available information used for planning and decision-making processes Number of industry actors and communities adopting and complying with biodiversity protection requirements Central CHM, BCH and ABS CH portal maintained with up-to-date national information and functional internationally and nationally National CHM, BCH and ABS CH pages created through the BIOLAND app A short- and medium-term training mechanism on sensitive aspects of biodiversity established and supported by awareness-raising and training programmes in projects with foreign financial assistance Gender-sensitive provisions in the implementation of actions to ensure the right to a healthy environment integrated into the Human Rights Action Plan.
A,B,C,D	**Target 22. Ensuring the participation, justice and rights of indigenous peoples and local communities, women, youth, persons with disabilities and environmental defenders**	**MD22 target:** Ensure the participation, justice and rights of individuals in a healthy environment, including vulnerable categories	Percentage of the population who consider decision-making to be inclusive and responsive, by gender, age, disability and population group The number of NGOs, local communities, persons of national minorities, migrants, vulnerable persons, etc. who are members of National Commissions (CITES/Biosafety Commission/PA Scientific Council, etc. in the process of consultation, information and decision-making on biodiversity/biosecurity
A,B,C,D	**Target 23. Implementation follows a gender-sensitive approach**	**Target 23.** Ensuring gender equality in the implementation of the framework, in which all women and girls have equal opportunities and capacity to contribute to the three objectives of the Convention	Proportion of seats held by women in (a) national parliaments and (b) local governments Amendment to the State Budget Law on Public Allowances for Gender Equality and Women's Ability in the Field of Nature Conservation Approved Percentage of the population who consider decision-making to be inclusive and responsive, by gender, age, disability and population group

The Biodiversity Programme includes **five specific objectives**, the implementation of which will be ensured by the action strands (**Table 27).**

Table 27. Specific objectives of the Programme

Specific Objective	Direction of action
Specific objective 1. *The connectivity, integrity and resilience of natural and semi-natural ecosystems are enhanced, including through protected areas and other effective area-based conservation measures covering at least 10% of the country's surface*.	**Direction of action 1.1**. *Ensuring the legal protection of at least 10% of the national territory, taking into account ecological corridors, protected areas and the Emerald Network in order to establish a coherent and resistant natural system.* **Direction of action 1.2.** *Restoring degraded ecosystems and their capacity to provide services, as well as promoting climate change mitigation and adaptation through ecosystem approaches.* **Direction of action 1.3**. *– Ensuring the conservation of natural values and aquatic biological diversity as well as the sustainable use of wetlands*.
Specific Objective 2: *The conservation status of threatened species is improved by 10%, the abundance of native species has increased, and human-induced extinctions have been stopped*.	***Direction of action 2.1***. *Ensure satisfactory conservation by 2030 or establish a clear positive trend for at least 30% of species and habitats protected under the Birds Directive and the Habitats Directive, whose conservation status is currently unsatisfactory.* **Direction of action 2.2.** *The anthropogenic causes of actual or potential adverse effects on the conservation status of species of wild fauna and flora shall be reduced, as far as possible, to levels that are not detrimental to the conservation and restoration of those species by specific measures adopted in legislation, policy and/or management.* **Direction of action 2.3.** *By 2030, biodiversity monitoring at national level will be developed and expanded, and biodiversity data will be made available to an extent that will facilitate the measurement of the achievement of the Programme's objectives.*
Specific Objective 3: *The contributions of wild flora and fauna and their natural habitats to a safe, clean, healthy and sustainable environment are valued, maintained and improved through concrete actions at national and local level.*	***Direction of action 3.1***. *Damage to natural and semi-natural ecosystems by invasive alien species and their diminished spread.* ***Direction of action 3.2***. *Limiting illegal trade in wildlife species.* ***Direction of action 3.3.*** *Agriculture without genetically modified organisms (GMOs), GMO imports authorised and monitored.* ***Direction of action 3.4***. *The trend of erosion of genetic diversity reversed, including by facilitating the use of traditional breeds and varieties and the fair and equitable distribution of benefits from the use of genetic resources ensured.*

Specific Objective 4: *Ensure, by 2030, scientific support in the field of conservation and sustainable use of biodiversity, communication and access to information, as well as the promotion of quality education*.	***Action line 4.1*** *Improve knowledge and access to information on the conservation and sustainable use of biodiversity.* ***Direction of action 4.2.*** *Monitoring, maintaining, developing and ensuring the continuity of biodiversity databases in the long term.* ***Direction of action 4.3.*** *Shaping attitudes towards the importance of biodiversity and preserving natural values, raising awareness, development and dissemination.* ***Direction of action 4.4.*** *Strengthen communication and professional cooperation, including at international level, for the conservation and sustainable use of biodiversity with all stakeholders.*
Specific Objective 5: *Ensure, by 2030, measures to increase the benefits of the use of natural resources and ecosystem services by increasing the financial commitment to stimulate investments in nature-based solutions*	***Direction of action 5.1****. Mobilising and ensuring adequate financial means and creating a regulatory environment conducive to biodiversity conservation and supporting it at legal, administrative, central and regional levels.* ***Direction of action 5.2****. Facilitate the financial contribution of stakeholders in biodiversity conservation by making the most of both public and private funding opportunities.* ***Direction of action 5.3.*** *Liability for causing damage to flora, fauna and habitats is insured.*

Chapter III: IMPACT OF THE PROGRAMME

The program contributes primarily to a higher degree of environmental protection, it is an obligation of the central and local public administration, as well as of individuals or legal entities. The protection of certain species or habitats and the establishment of protected areas, as well as the measures established for the protection of the environment are priorities with other interests. For the conservation of natural habitats, biodiversity that defines the biogeographical framework of the country, as well as natural structures and formations with ecological, scientific and landscape value, the national network of protected areas and nature monuments is maintained and developed.

The possible benefits of implementing the programme are described below, accompanied by regulations taken from international treaties and the experience of other countries.

Field of nature restoration:

- Creation of ecological corridors between forest bodies, including between PAs, to improve the probability of survival of threatened species (by providing

shelter, food, migration routes, etc. for animals, restoring suitable habitats for animals and plants).

- Reducing excessive grazing, better conditions for restoring the diversity of grassland and meadow species, while maintaining the steppe and forest populations under threat, such as: *Saga Pedo, Otis Tarda, Felis Silvestris.*
- Restoring the sequestration capacity and carbon storage potential in pasture ecosystems following the introduction of sustainable pasture management practices per 100 ha.
- Reintroducing abandoned pastures into use will reduce degradation pressures on forests, steppes and other natural landscapes, which are currently heavily used for grazing due to the shortage of good pastures. This, in turn, will create better conditions for restoring the diversity of grassland and grassland species, while keeping steppe and forest populations under threat.
- Preventing the appearance of unwanted invasive species and restoring the initial composition of the vegetation.
- Increase by 100 ha of the forested area in degraded areas, reduce forest drying, prevent the decrease in groundwater levels in forests and adjacent areas, restore sequestration and other ecosystem functions of forests.
- Maintaining the carbon reserve of forests in the targeted area, supporting natural regeneration and reforestation with native species (per 100 ha) lead to the restoration of the carbon sequestration capacity for forests.

Field of Facilitating Change

- establishing a new biodiversity governance framework, with obligations and implementation benchmarks, to ensure shared accountability and accountability of all actors in delivering on biodiversity-related commitments. The framework will also strengthen stakeholder engagement and transparent and participatory governance.
- accelerating the implementation and enforcement of environmental legislation;
- harnessing the whole-of-society approach by involving businesses, mobilising private and public finance at national level, directing investments towards a green recovery and the implementation of nature-based solutions, as well as strengthening knowledge, education and skills for the protection and restoration of biodiversity.

Biodiversity conservation measures **will contribute** maintaining and improving the potential of ecosystems, protecting habitats, halting the loss of flora and fauna, mitigating the risks of natural disasters and, finally, increasing the well-being and health of the population.

The promotion of effective biological security policies will ensure the use of modern biotechnologies on the principles of harmlessness and reduction of risks to biodiversity, will facilitate the promotion of organic farming, as well as will prevent negative effects on the health of the population and the development of communities.

The implementation of the Programme's actions will cause medium-term effects on target groups, especially women.

Also, some categories of the population, such as children and people with chronic diseases, are much more vulnerable to the impact caused by biodiversity loss, so the activities will contribute to reducing the social and economic risk on these categories of population.

The impact indicators mainly target the impact on people's quality/health of life, being correlated with both the SDG indicators and those of the global biodiversity framework.

The program sets significant improvements of the institutional framework and the application of an efficient management for the forest fund and national ecological networks as well as that of the protected natural areas.

The program will boost public information and participation in decision-making associated with biodiversity conservation, promotion and media coverage of the program to raise awareness of the population regarding the actions of sustainable management of natural resources.

The research and monitoring programs will allow to ensure the study based on knowledge and skills necessary to promote sustainable development, increase the efficiency of the use of resources, ecological technologies and industrial processes; efficient use of natural resources; implementing science-based management plans, strengthening regional and international cooperation on access to science, technology and innovation.

Chapter IV: COSTS

For the successful implementation of this Program, human, financial and technical resources are needed.

The human resources will be made up of the staff of the environmental authorities, research institutions, the business environment and the associative environment.

The financial resources will come from the sources of the state budget, including from the National Environmental Fund, funds from foreign donors and from other sources allowed by legislation. The Ministry of Environment will ensure the annual correlation of the costs of the activities included in the Program's Action Plan with the volume of allocations provided for the National Environmental Fund in the State Budget Law.

In accordance with the provisions of the national legal framework, annually, the budget planning process takes place on the basis of the Medium-Term Expenditure Strategy for a period of 3 years, which is part of the elaboration of the Medium-Term Budgetary Framework (MTBF).

The technical resources encompass all the needs for the management of programs and projects in the field of biodiversity.

The actions related to the elaboration and implementation of the normative framework will be carried out directly by the central public administration authorities and will not condition additional costs to those provided for in the state budget.

The actions for the development of laboratories, monitoring systems will be financed within the financial means of the state budget, from technical assistance and external investment, as well as from other sources, which do not contravene the legislation.

The estimated implementation costs of the National Action Plan for Biodiversity Financing in line with the post-2020-2030 GBF targets have been assessed at the amount of ...(TbD) and will be provided from the state budget and other external sources, including through the National Environmental Fund. (**Table 28**).

Table 28. Estimation of the costs for the implementation of the Program, by years and sources of financing, (thousand lei)

The objectives of the Programme will constitute the strategic framework for expenditure planning (CBTM) in 4 Budgetary Programmes and sub-programmes, as follows:

Program 50. General economic and commercial services
Subprogram 5010. Climate change – predictions, forecasts and warnings

Program 51. Development of agriculture
Subprogram 5108. Irrigation and dewatering systems

Program 54. Sustainable management of the national forest sector
Subprogram 5401. Management in the forest sector
Subprogram 5402. Planning, regeneration, extension and protection of the national forest fund
Subprogram 5403. Development of ecotourism, fish farming and hunting
Subprogram 5404. Development of natural areas protected by the state

Program 70. Environmental protection
Subprogram 7001 Environmental Protection Policies and Management;

Subprogram 7003. Control and supervision of compliance with environmental legislation;

Subprogram 7004. Protection and management of water resources, floods and droughts;

Subprogram 7005. Protection and conservation of biodiversity;

Subprogramme 7007. Applied scientific research in the field of environmental protection

Subprogram 7011. Climate change mitigation and adaptation

In accordance with the provisions **of the Government Decision on the approval of the Medium-Term Budgetary Framework (2024-2026) no. 408 of June 21, 2023, the Medium-Term Budgetary Framework (MTBF) 2024-2026** – is reflected in the Subprogram "7005 - Protection and conservation of biodiversity".

The main activities of the sub-programme and the medium-term expenditure are represented in the following **Table 29**:

Table 29. Main activities of the sub-programme and medium-term expenditure

Activities	2024 (LEI/EUR)	2025 (LEI/EUR)	2026 (LEI/EUR)
Ensuring the current activity of budgetary authorities/institutions (Ministry of Environment)	2000.0/106.2	2000.0/106.1	2000.0/106.2
Projects financed from external sources (Project "Integrated management system for the conservation and sustainable use of biodiversity and equitable sharing of benefits resulting from the use of genetic resources", Project "Conservation and sustainable management of wetlands with a focus on areas of high natural value in the Prut river basin")	10 612.0/563.6	8165.0/433.6	6800.0/361.1
National Environmental Fund (revenues come from the environmental pollution system/polluter pays, penalties for illegal actions and authorizations for taxes for the use of natural resources	21 922.5/1164.2	21 922.5/1164.2	21 922.5/1164.2
Total subprogram 7005	**34 534.5/ 1834.0**	**32 087.5/ 1704.1**	**30 722.5/ 1631.6**

The draft MEDIUM-TERM BUDGETARY FRAMEWORK 2025-2027 lists **the Objectives of the "Environmental Protection" Sector.**

The policies promoted in the field of environmental protection will focus on the

following objectives:

- improving water, air and soil quality;
- sustainable growth of forest areas and protected areas;
- ensuring responsible consumption of natural resources;
- active transition to the green and circular economy.

I. ***Priorities of the sector***

1. Ensuring the integrated management of water resources and aquatic ecosystems, in accordance with international environmental requirements, including by strengthening the dialogue with Romania and Ukraine;
2. Integrated waste and chemical management;
3. Implementation of the National Program for Forest Extension and Rehabilitation 2023-2032;
4. Development of the system of evaluation, monitoring, reporting, control and accountability of the use of natural resources;
5. Implementation of the Green and Circular Economy Promotion Program 2024-2028.

II. ***Key performance indicators by sector***

1. 152.3 km of internal rivers cleaned, deepened, unblocked; flood protection infrastructure strengthened/rehabilitated (51.1 km on the Prut River, 65.5 km on the Dniester River);
2. Waste management system in 3 waste management regions (RMD 1, RMD 5, RMD 8) developed in volume of 70%;
3. Extended and rehabilitated forests on an area of 44 thousand ha;
4. Program for the rational use of useful mineral resources approved and implemented in a volume of 30%;
5. The program to promote the green and circular economy 2024-2028 implemented at the level of 70%.

The main sub-programmes that have a direct relevance on biodiversity in the Republic of Moldova are:

Subprogramme 5010 'Climate change - predictions, forecasts and warnings'

Main activities under the sub-programme and medium-term expenditure

Activities	2025	2026	2027
Ensuring the current activity of budgetary authorities/institutions *(State Hydrometeorological Service)*	39 373,5	39 373,5	39 373,5
Total subprogram 5010	**39 373,5**	**39 373,5**	**39 373,5**

Subprogramme 5108 'Irrigation and dewatering systems'

Main activities under the sub-programme and medium-term expenditure

Activities	2025	2026	2027
Maintenance and operation of irrigation and dewatering systems	7 000,0	7 000,0	7 000,0
Total subprogramme 5108	**7 000,0**	**7 000,0**	**7 000,0**

Subprogramme 5401 "Management in the field of the forest sector"

Main activities under the sub-programme and medium-term expenditure

Activities	2025	2026	2027
Ensuring the current activity of budgetary authorities/institutions ("Moldsilva" Agency)	7 937,0	7 937,0	7 937,0
Total subprogramme 5401	**7 937,0**	**7 937,0**	**7 937,0**

Subprogram 5402 "Arrangement, regeneration, extension and protection of the national forest fund"

Main activities under the sub-programme and medium-term expenditure

Activities	2025	2026	2027
Regeneration, afforestation and protection of the forest fund (00143)	11 000,0	11 000,0	11 000,0
Extension of areas covered by forest vegetation (00526)	100 000,0	100 000,0	100 000,0
Total subprogramme 5402	**111 000,0**	**111 000,0**	**111 000,0**

Subprogram 5404 "Development of natural areas protected by the state"

Main activities under the sub-programme and medium-term expenditure

Activities	2025	2026	2027
Ensuring the sustainable management of the national forest sector	41 294,8	41 294,8	41 294,8
Total subprogramme 5404	**41 294,8**	**41 294,8**	**41 294,8**

Sub-programme 7005 "Protection and conservation of biodiversity"

Main activities under the sub-programme and medium-term expenditure

Activities	2025	2026	2027
Ensuring the current activity of budgetary authorities/institutions *(Ministry of Environment)*	1 000,0	1 000,0	1 000,0

Projects financed from external sources *(Project "Integrated management system for the conservation and sustainable use of biodiversity and equitable sharing of benefits resulting from the use of genetic resources", Project "Conservation and sustainable management of wetlands with a focus on areas of high natural value in the Prut river basin", Project "Biosafety implementation framework for the management of biological resources in Moldova")*	8 925,0	7 560,0	4 900,0
National Environmental Fund	40 000,0	40 000,0	40 000,0
Total subprogramme 7005	**49 925,0**	**48 560,0**	**45 900,0**

Total resource allocations by sub-programmes:

Name of the sub-programme	2024 approved	2025	2026	2027
1	**1**	2	**3**	**4**
7001 Policies and management in the field of environmental protection	57 015,6	65 957,6	66 608,9	66 608,9
7003 Control and supervision of compliance with environmental legislation	**72 308,8**	**77 392,4**	**77 303,7**	**77 303,7**
dintre care, bugetul local	*21 500,0*	*21 500,0*	*21 500,0*	*21 500,0*
7004 Protecția și gestionarea resurselor de apă, a inundațiilor și secetelor	**154 422,7**	**175 163,3**	**175 163,3**	**175 163,3**
7005 Protecția și conservarea biodiversității	**34 300,5**	**49 925,0**	**48 560,0**	**45 900,0**
7007 „Cercetări științifice aplicate în domeniul protecției mediului”	**118 256,1**	**118 256,1**	**118 256,1**	**118 256,1**
7011 Atenuarea și adaptarea la schimbările climatice	**10 108,4**	**34 390,2**	**30 064,4**	**26 564,4**
5010 Schimbări climatice - predicții, prognoze și avertizări	**36 790,2**	**39 373,5**	**39 373,5**	**39 373,5**
5401 Managementul în domeniul sectorului forestier	**6 584,8**	**7 937,0**	**7 937,0**	**7 937,0**
5402 Amenajarea, regenerarea, extinderea și protecția fondului forestier național	**111 000,0**	**111 000,0**	**111 000,0**	**111 000,0**
5404 Asigurarea gestionării durabile a sectorului forestier național	**41 294,8**	**41 294,8**	**41 294,8**	**41 294,8**
dintre care, bugetul local	*31 294,8*	*31 294,8*	*31 294,8*	*31 294,8*

Total pe sector (Mii lei)				

Chapter V: RISKS IN THE IMPLEMENTATION PROCESS

In the process of implementing this Program, it is possible for various barriers and risks to appear, thus the potential risks and the measures to mitigate them have been anticipated.

1) Internal risks:

- inefficient participation of the institutions responsible for implementing the actions of the developed plan;
- lack of qualified staff in the field of reference and uncontrolled staff turnover;
- insufficient involvement of decision-makers in carrying out the tasks of the Programme;
- institutional and interinstitutional communication deficiencies;
- the complexity of the problems addressed;

2) External risks:

- delaying the process of implementing the measures established by the relevant institutions;
- the unpredictability of political decisions;
- insufficient funding of the actions of the Action Plan for the implementation of the Programme.

In order to successfully implement the Action Plan for the implementation of the Programme, a series of risks have been identified, with their impact and probability estimated, divided according to the following types of risks according to **Table 30:**

Table 30. Categories of risks regarding the implementation of the Programme, with estimation of their impact and probability

Risk categories	Types of risks	Impact	Probability
Technological risks	Limited access to technology – the technologies required to implement the program may be expensive or unavailable, which can pose barriers to program implementation.	Medium	Increased

Organizational risks	Rigidity of state institutions in aligning interventions with the development policy of the field of environmental protection	Medium	Increased
	Turnover of qualified personnel within state public institutions/lack of institutional memory	Increased	Increased
Management risks/ Operational	Availability and reduced capacity to mobilize resources for co-financing projects in the field	Medium	Increased
	Delaying the implementation of institutional reforms	Medium	Increased
External risks	The impact of the war in the AU	Medium	Average
	Climate change and natural disasters	Increased	Increased

In the risk management process, those responsible from all institutions responsible for carrying out the actions of the plan are determined. The process of implementing the measures established in the Program, the risks related to the development of the activities will be analyzed and evaluated annually and actions will be taken to remedy the situation at all institutional levels.

Chapter VI: RESPONSIBLE AUTHORITIES/INSTITUTIONS

- Ministry of Environment with its internal structural subdivisions and subordinate institutions (Environment Agency, "Apele Moldovei" Agency, "Moldsilva" Agency, ICAS, Environmental Protection Inspectorate, State Hydrometeorological Service);
- Ministry of Agriculture and Food Industry;
- National Agency for Food Safety;
- Ministry of Infrastructure and Regional Development;
- Ministry of Health (National Public Health Agency);
- Ministry of Education and Research with subordinate institutions (USM (Institute of Zoology, Institute of Ecology and Geography, National Botanical Garden (Institute) "*Alexandru Ciubotaru"*);
- Congress of Local Public Authorities (CALM);
- Business environment;
- Environmental civil society;

- Development partners.

Chapter VII. REPORTING, MONITORING AND EVALUATION PROCEDURES

The Ministry of Environment is responsible for monitoring the implementation of this Programme, which will collect, analyze and systematize the data on the monitoring indicators and results at the end of each year.

The evaluation system of the Programme will be integrated into the cycle of policies/programmes and will comprise two evaluation exercises, one at the end of the first phase of the National Programme (2024-2026) – until 1 April 2027, and one at the end of the National Programme (2027-2030) – 1 April 2031. The Ministry of Environment will be responsible for coordinating both the interim and final evaluations.

The Ministry of Environment will ensure the publication of the annual progress reports and the mid-term and final evaluation reports of the Programme on the official website of the authority.

ACTION PLAN
on the implementation of the Biodiversity Programme for the years 2024-2030

o. rt.	General objectives/specific objectives/actions	Monitoring indicators	Estimated costs, thousands of lei	Source financing	Deadlines	Responsible institutions	Partners
	2	3	4	5	6	7	8
General objective 1. ***The connectivity, integrity and resilience of natural and semi-natural ecosystems are enhanced, including through protected areas and other effective area-based conservation measures covering at least 10% of the country's surface.***							
Direction of action 1.1. ***Ensuring the legal protection of at least 10% of the national territory, taking into account ecological corridors, protected areas and the Emerald Network in order to establish a coherent and resilient natural system*** **MD Target 1:** Ensure the institutional framework and apply effective management for the forest fund and national ecological networks **MD target 3.** Expanding the areas of natural areas protected by the state up to 8% of the country's territory and ensuring their sustainable management							
1.1	1.1.1 Improvement of the regulatory framework in the field of biodiversity conservation in accordance with the transposition commitments assumed within the Moldova-EU Association Agreement	Draft law for the modification of the Law of the animal kingdom no. 439/1995 and the Law of the Plant Kingdom no. 239/2007 Forest Protection Curtains Act approved (2025)	144.10 thousand lei	State budget	2025	Ministry of Environment	

	2	3	4	5	6	7	8
	1.1.2 Drafting the Law on Protected Areas in a new wording, taking urgent and meaningful measures to reduce the degradation of natural habitats, halt biodiversity loss and, by 2030, protect and prevent the extinction of threatened species	The draft Law on Protected Natural Areas elaborated	84.40 thousand lei	State Budget / External Assistance	2025	Ministry of Environment	AO EcoContact Biotic Society
	1.1.3 Determination and description of habitat types found on the territory of the Republic of Moldova with names and summary characterizations in the habitat classification systems CORINE (1991), PALAEARCTIC HABITATS (1996, and EUNIS (1997-2005).	List of habitats drawn up with summary characteristics in the CORINE and EUNS classification systems		State budget	2025	Ministry of Environment, Environment Agency, USM with Research institutions	
	1.1.4 Establishment of the Protected Areas Agency	Draft GD on the creation of the Protected Areas Agency elaborated		State budget	2024	Ministry of Environment,	
	1.1.5 Improving the management system of protected natural areas, including by defining clear conservation objectives and measures and by properly monitoring their application	Elaboration of 7 Management Plans for protected areas with legal personality (Scientific Reserves, Lower Prut Biosphere Reserve, Lower Dniester National Park).		State budget	annual	Ministry of Environment Administration of Protected Natural Areas	

	2		3	4	5	6	7	8
	1.1.6	Ensuring sustainable management of High Conservation Value Forests (HLPs)	Criteria/standards for the identification of PVRC in the Republic of Moldova applied Ensuring continuity of forest management for all PVRCs		State budget	annual	Ministry of Environment Moldsilva Agency Administration of Protected Natural Areas	
	1.1.7	Expanding the Emerald Network by including new areas with habitats and species included in the lists of the Berne Convention	Revised sufficiency index, Emerald network area expanded by 10%		State budget	2030	Ministry of Environment Administration of Protected Natural Areas	
	1.1.8	Development of management plans for Emerald sites	Draft Government Decision on the approval of the Framework Regulation on the Management Plan for the Emerald Network sites 10 Management Plans for Emerald Network Sites Approved		State Budget / External Assistance	2030	Ministry of Environment	
	1.1.9	Ensuring the institutional framework for the transition of the Emerald Network of the Republic of Moldova to the Natura 2000 Network, according to the EU Habitats Directive and the Birds Directive	2 Emerald sites connected to Natura 2000		External assistance *(LIFE project*	2025	Ministry of Environment	ICAS, Civil Society

	2	3	4	5	6	7	8
	1.1.10 Elaboration of the Emerald Network Sites Register	Draft Government Decision on the approval of the Regulation on the manner of maintaining the Register of Emerald Network Sites *(MM Action Plan for 2024)*			2024	Ministry of Environment	ICAS
	1.1.11 Elaboration of GIS maps and Integration of Emerald Network sites in the system of state protected areas and territorial planning	Developed GIS maps and Emerald Network sites integrated into the system of state protected areas and territorial planning www.geoportal.md)		State Budget / External Assistance	2025	Ministry of Environment Geodesy, Cartography and Cadastre Agency Environment Agency	
	1.1.12 Updating the management plans according to the forest management indicators of the National Forest Fund.	5 management plans from the National Forest Fund updated		State budget	2030	Ministry of Environment Moldsilva Agency Administration of Protected Natural Areas	

	2	3	4	5	6	7	8
	1.1.13 The multiple values of biodiversity are integrated into the country's sustainable development policy framework, including at local level	Number of updated sectoral policy documents with provisions on biodiversity values Modification of the regulatory framework (Law 435 of 2006 on administrative decentralization and Law 436 of 2006 on local public administration and other related normative acts). Number of normative acts in the field of biodiversity issued/adjusted by local public authorities		State budget	2030	Ministry of Environment APL	
	Direction of action 1.2. ***Restoring degraded ecosystems and their capacity to provide services, as well as promoting climate change mitigation and adaptation through ecosystem approaches*** **MD Target 2:** Ecological reconstruction of degraded ecosystems to ensure at least 10% of degraded land **MD target 4.** Protection of endangered species included in the Red Book of the Republic of Moldova **Target MD7.** Reducing pollution from all sources impacting biodiversity and ecosystem services **MD8 target.** Minimising the impact of climate change, including through nature-based solutions and/or ecosystem approaches **MD Target 11:** Restoration, maintenance and enhancement of nature's contributions, including ecosystem services in sectors of the national economy, particularly at local/community level						

	2	3	4	5	6	7	8
.2	1.2.1 Restoring the numbers (populations) of rare and endangered species	Number of species restored, habitats improved		State Budget / External Assistance *Joint projects? (e.g., GB + Biotica)*		USM (academic institutions), NGO community	Civil society
	1.2.2 Update of the List of species included in the Red Book of the Republic of Moldova.	100% by 2030 updated list. Elaboration and publication of the 4th Edition of the Red Book of the Republic of Moldova Index of the list of species in the Red Book of the Republic of Moldova updated (RLI for Moldova 0.02% by 2027)	12 thousand MDL	FNM / State Budget	2027	Ministry of Environment ONIPM, USM (Institute of Zoology, Botanical Garden Institute)	
	1.2.3 Ensuring the conservation measures of the endangered species included in the Red Book within the management plans of the Protected Areas	7 Conservation plans for threatened species included in the CR, developed within the management plans of protected areas (Emerald).		State budget	2030	Administration of Protected Natural Areas USM (Institute of Zoology, Botanical Garden Institute)	

	2	3	4	5	6	7	8
	1.2.4 Ecological passports of threatened species developed	4 ecological passports of flora and 11 endangered fauna species developed		State Budget / External Assistance *(UNDP Prut project*	2025	Administration of Protected Natural Areas	
	1.2.5 Ensuring the survival of Emerald species and ensuring the sufficiency index of species through conservation measures and expansion of Emerald sites.	Sufficiency index increased to 50% and Emerald network area expanded by 10%		State budget	2027	USM (Institute of Zoology, Botanical Garden Institute	
	1.2.6 Creation of protective forest curtains and afforestation of riparian strips, including by planting forest crops	Works to create forest curtains for the protection and afforestation of riparian strips on 12080 ha completed by 2027 *(PNERP)*		State budget	2027	Ministry of Environment Moldsilva Agency APL	
	1.2.7 Identification and designation of new areas of valuable importance for biodiversity and their inclusion in the system of natural areas protected by the state.	Total area of state protected areas extended to 8% of the country's surface		State Budget / External Assistance	2030	Ministry of Environment Moldsilva Agency APL	

	2	3	4	5	6	7	8
	1.2.8 Nature-based solutions (NbS) on the restoration of agroecosystems in the Dniester River basin to reduce pollution in the Black Sea basin through the creation of curtains and afforestation of riparian strips	Reducing soil erosion processes and protecting about 350 thousand ha of agricultural land by creating/rehabilitating 10 thousand forest curtains to protect agricultural fields by 2032 *(PNERP)*		State Budget / External Assistance	2030	Ministry of Environment Moldsilva Agency APL	
	1.2.9 Adapting regeneration and logging practices to the needs of climate change	Updating and revising the technical norms for forest regeneration adapted to climate change. Increasing the resilience of forest ecosystems to climate change through ecological reconstructions and forest treatments Infrastructure related to the modernized and functional logging process		State budget		Ministry of Environment Moldsilva Agency	

	2	3	4	5	6	7	8
	1.2.10 Targeted use of modern biotechnologies for the propagation of vegetative material to provide the forest sector with reproductive material in the new climatic conditions, through the creation of regional centers for the industrial growth of forest reproductive material	Commissioning of the National Center for Forest Genetics and Seminology with three regional centers for industrial growth of forest reproductive material. The overall capacity of the respective industrial centers will ensure the production of about 85-90 million seedlings annually (including about 20-30% with protected roots). Regional centers for the industrial growth of forest reproductive materials are created (3 units), technically equipped and functional Annual production of 60-65 million seedlings reached (including 40% with protected roots), for afforestation, regeneration and ecological reconstruction *(PNERP)*		State Budget / External Assistance		Ministry of Environment Moldsilva Agency	

	2	3	4	5	6	7	8
	1.2.11 Implementation of silvo-pastoral arrangements in order not to admit the over-exploitation of habitats and to ensure a long-term development of biodiversity	Area (1500 ha)		EU 4Environment (WB)		APL	Civil society
	1.2.12 Restoration, maintenance and enhancement of nature's contributions, including ecosystem services in sectors of the national economy, particularly at local/community level	The study on the Evaluation of the monetary and non-monetary costs of ecosystem services carried out Improved practices on the inclusion of ecosystem services in territorial planning by accessible and accessible LPAs		State Budget / External Assistance		Ministry of Environment APL	
	1.2.13						
Direction of action 1.3. – ***Ensuring the conservation of natural values and aquatic biological diversity as well as the sustainable use of wetlands.***							
	1.3.1 Proposal of a new Ramsar site (PNERP) in the Middle Prut area - Țuțora (Pădurea Domnească)	Ramsar site created and approved by the Ramsar Convention (9671 ha)		State Budget / External Assistance	2028	Ministry of Environment, Moldsilva Agency, APL	NGOs

	2	3	4	5	6	7	8
	1.3.2 Designation of wetlands: Antonești floodplain 93.6 - ha, Cantemir floodplain - 132 ha, Sirma floodplain - 95.96 ha	3 wetlands of national importance established, total - 321.56 ha		State Budget / External Assistance	2027	Ministry of Environment Moldsilva Agency Administration of Protected Natural Areas	
	1.3.3 Carrying out soil regeneration measures and replanting native vegetation in wetlands on an area of 50 ha	Degree of implementation of restoration measures, improvement of soil quality and wetland biodiversity.		State Budget / External Assistance	2025	Ministry of Environment Moldsilva Agency Administration of Protected Natural Areas	
	1.3.4 Testing of nature-based practices (NbS) for the restoration of wetlands in Lake Beleu (RBPJ)	Practices, Surface		BOKU (Austria)	2027	CR Cahul, APL	Civil society
	1.3.5 Ecological reconstruction of degraded ecosystems to ensure at least 10% of degraded land	Wetlands cover by 2027 – up to 65 km2 inclusive: The wetlands on an area of 50 ha of the Lower Prut Biosphere Reserve, 3000 ha of aquatic and marsh ecosystems from RPBJ restored 11,000 ha of meadow ecosystems from the Pădurea Domneasca Reserve (Middle Prut) restored		State Budget / External Assistance	2027	Ministry of Environment Administration of Protected Natural Areas	

	2		3	4	5	6	7	8
Specific Objective 2: ***The conservation status of threatened species is improved by 10%, the abundance of native species has increased, and human-induced extinctions have been stopped.***								
Direction of action 2.1. ***Ensure satisfactory conservation by 2030 or establish a clear positive trend for at least 30% of species and habitats protected under the Birds Directive and the Habitats Directive, whose conservation status is currently unsatisfactory.*** **MD Target 10:** Sustainable management of agricultural areas, aquaculture, fisheries and forestry								
.1	2.1.1	Development and implementation of plans for captive breeding and reintroduction into the natural habitat of 2 species of	Percentage of population growth of threatened species, success of reintroduction plans		State Budget / External Assistance	2025-2030		
	2.1.2	Conducting periodic analyses of genetic diversity in keystone species populations. Implementation of genetic management programs within conservation plans.	Degree of genetic diversity maintained in keystone species populations		State Budget / External Assistance	2026		

	2	3	4	5	6	7	8
	2.1.3 Develop mechanisms for managing human-wildlife conflicts, including in terms of resources and living space, resulting in negative impacts on human life, health, well-being and/or livelihoods. As a result of those actions and threats, people may take actions that result in the damage or elimination of wildlife, either intentionally or unintentionally. Human-wildlife conflicts can be mitigated or avoided through appropriate planning, management and compensation measures.	Mechanisms for reducing or mitigating the number of human-wildlife conflicts and increasing the effectiveness of conflict management measures, developed		State Budget / External Assistance	2027		
	2.1.4 Measures for the restoration of characteristic habitats taking into account trade-offs (potential ecological, economic and social costs and benefits)	Number of measures applied to restore characteristic habitats.		State Budget / External Assistance	2025		
	2.1.5 Introduction of endangered and endangered species in the Living Planet Index and Global Biodiversity Information Facility databases	Increasing the number of species records in the Living Planet Index and Global Biodiversity Information Facility database					

	2	3	4	5	6	7	8
	2.1.6 Sustainable management of agricultural areas, aquaculture, fisheries and forestry	The degree of halting the decline of the established pollinator population – by 10% Silvo-pastoral arrangements developed in order not to admit the over-exploitation of habitats and to ensure a long-term development of biodiversity on the area of 1500 ha Draft law for the amendment of Law no. 44/2022 on the production, marketing and use of forest reproductive material 5000 ha of silvopastoral and agroforestry systems created and/or rehabilitated (PNERP)					

	2	3	4	5	6	7	8
Direction of action 2.2. ***The anthropogenic causes of actual or potential adverse effects on the conservation status of species of wild flora and fauna shall be reduced, as far as possible, to levels that are not detrimental to the conservation and restoration of those species, by specific measures adopted in legislation, policy and/or management*** **MD Target 9:** Sustainable management of wildlife species in the forest fund improves, providing social, economic and environmental benefits							

.2	2.2.1	Sustainable management of wildlife in the forest fund improves, providing social, economic and environmental benefits	Forest fund management plan in the context of identifying the benefits of sustainable use of wildlife developed and adopted 84% of the forest area managed in accordance with the long-term management plans towards 2027 (text of the MS) Draft Government Decision on the approval of the Regulation on the placing on the market of wood and wood products Draft Government Decision on the establishment of a FLEGT licensing regime for the import of timber		State Budget / External Assistance	2030	Ministry of Environment Moldsilva Agency	

	2	3	4	5	6	7	8
		Regulatory framework on the regulatory mechanism for the sustainable use of non-wood products from forests developed and approved Processing halls for non-wood products from created forests Elaboration of the normative framework related to the Law on Hunting and Protection of the Hunting Fund					
	2.2.2 Implementation of an effective reporting system for wildlife use activities	Coverage of monitored areas, number of compliant reports Birds to Control Directive Reporting System		State Budget / External Assistance	2025		
	2.2.3 Implement clear labelling and certification mechanisms for wildlife products.	Increase the percentage of products labelled and certified as coming from sustainable and legal sources.		State Budget / External Assistance	2026		

	2	3	4	5	6	7	8
Direction of action 2.3. ***By 2030, biodiversity monitoring at national level will be developed and expanded, and biodiversity data will be made available to an extent that will facilitate the measurement of the achievement of the Programme's objectives*** ***Target MD 20.*** *Capacity building and development, technology transfer and technical and scientific cooperation for implementation*							
.3	2.3.1 Integrated Biodiversity Information System (Species, flora, fauna, rare species, alien invasive species, protected areas, forest fund, Emerald Network) developed, implemented and managed.	GIS maps elaboration for the cadastre of Species, flora, fauna, rare species, alien invasive species, genetic resources, gene banks, protected areas, forest fund, Emerald Network. Specialized digital cadaries, elaboration, managed, functional and accessible to the public. Prototype of the SII developed and piloted		State Budget / External Assistance	2026	Environment Agency	
	2.3.2 Central CHM, BCH and ABS CH portal maintained with up-to-date national information and functional internationally and nationally			State budget			

	2	3	4	5	6	7	8
	2.3.3 Biological Resources Monitoring System established and accessible in the decision-making process	Elaborate and accessible databases in the field of biological resources.		State budget	2026	Ministry of Environment	
	2.3.4 Habitat types identified	List of habitat types developed and approved by Order MM		State budget	2025	Ministry of Environment	
	2.3.5 Development of the mechanism for reporting companies that have a negative impact on biodiversity	Number of companies reporting on disclosure of risks, dependencies and impacts on biodiversity		State budget / business environment	2026	Ministry of Environment	

Specific Objective 3: ***The contributions of wild flora and fauna and their natural habitats to a safe, clean, healthy and sustainable environment are valued, maintained and improved through concrete actions at national and local level***

Direction of action 3.1. ***Damage to natural and semi-natural ecosystems by invasive alien species and their diminished spread.***

MD target 6. Management of invasive alien species
MD12 target: Improvement of green (blue) spaces and urban planning

	2	3	4	5	6	7	8
.1	3.1.1 Elaboration of the normative framework on invasive alien species	Law on invasive alien species harmonised with the EU legal framework, approved Regulation on the mechanism for limiting, controlling and eradicating invasive alien species, including emergency measures approved by GD Regulation on the authorization, introduction, introduction, transport and placing on the market, offering, breeding or release into the environment of pronounced invasive alien species, approved by GD		State budget	2025-2027	Ministry of Environment	

	2	3	4	5	6	7	8
	3.1.2 The risks associated with invasive alien species and their spread are assessed and mitigated	Databases and monitoring system set up within the Environment Agency Risk assessment system for invasive alien species created and operational		State budget	2027	Ministry of Environment Environment Agency	
	3.1.3 Elaboration of national lists of invasive alien species established on the territory of the Republic of Moldova (based on international and EU lists)	Number of invasive alien species (lists approved by GD)		State budget	2025-2027	Ministry of Environment USM (Institute of Zoology, Botanical Garden Institute	Civil society
	3.1.4 Development of local plans for the eradication of pronounced invasive alien species	3 pilot plans developed		State budget	2025-2030	Ministry of Environment USM (Institute of Zoology, Botanical Garden Institute	
	3.1.5 Development of plans to manage the benefits generated by invasive alien species	2 Invasive alien species management plans developed		State budget	2025-2030	Ministry of Environment USM (Institute of Zoology, Botanical Garden Institute	
	3.1.6 Conducting an analysis of the impact of spotted deer on the regeneration of protected forest ecosystems	Study conducted, proposed recommendations		State budget	2024	Ministry of Environment Moldsilva Agency USM (Institute of Zoology, Botanical Garden Institute	Experts, civil society

	2	3	4	5	6	7	8
	3.1.7 Organization of periodic inspections of plant and pet stores, active detection of illegal actions of introduction of potentially invasive species	Number of inspections organised		State budget	Periodically	Ministry of Environment Environmental Protection Inspectorate	
	3.1.8 Raising awareness and sensitization at national level regarding the problems caused by invasive alien species in the interior and exterior areas of the Republic of Moldova	High awareness and sensitization		State budget		Ministry of Environment Environmental Protection Inspectorate	
	3.1.9 Elaboration of recommendations on the regulatory framework for establishing sanctions, in case of non-compliance with the implementation of the provisions of the land use plans, which affect biodiversity	Amendment of the Contravention Code		State budget		Ministry of Environment Environmental Protection Inspectorate	
	Direction of action 3.2. ***Limiting illegal trade in wildlife species*** **MD5 target.** The harvesting, use and trade of wildlife species is sustainable, safe and in accordance with the provisions of national legislation and the CITES Convention						

	2	3	4	5	6	7	8
3.2	3.2.1 Implementation of the provisions of the EU Action Plan against Wildlife Trafficking	Procedure for authorising export and import activities of wild plants and animals, their parts and derivatives, as well as the import/export or re-export of species of fauna and flora regulated by the Convention on International Trade in Endangered Species of Wild Fauna and Flora CITES updated and approved by GD		State budget	2025	Ministry of Environment Environment Agency	
	3.2.2 Intensify systematic and priority control within national borders, providing an adequate fund of personnel and infrastructure to carry out tasks.	Infrastructure with adequate staff for organised border control		State budget		Ministry of Environment Environment Agency Customs Service	
	3.2.3 Assessment of stocks of species included in the list of the CITES Convention, exploited for commercial purposes in the Republic of Moldova,	Report on the assessment of CITES stocks carried out		State budget	2025-2026	Ministry of Environment Environment Agency USM (Institute of Zoology, Botanical Garden Institute	

	2	3	4	5	6	7	8
	3.2.4 The proportion of illicit wildlife trade (including derived products, parts thereof) that have been poached or smuggled reduced by 30% by 2027	Reports to the Environment Agency		State budget	2025-2026	Ministry of Environment Environment Agency Customs Service	
	3.2.5						
Direction of action 3.3. ***Agriculture without genetically modified organisms (GMOs), GMO imports authorised and monitored*** **MD Target 17:** Ensure functional biosafety in accordance with the Cartagena Protocol and the Nagoya-Kuala Lumpur Additional Protocol on Liability and Compensation							

	3.3.1 Ensuring functional biosafety in accordance with the Cartagena Protocol and the Nagoya-Kuala Lumpur Additional Protocol on Liability and Compensation	Draft law on the use of genetically modified microorganisms in isolation conditions Elaboration of the regulatory framework on the use of GMOs, including microorganisms, in isolation conditions Draft Government Decision on the implementation of the provisions of Law no. 152/2022 on the regulation and control of genetically modified organisms Draft Government Decision on the approval of the Regulation on cross-border movements of genetically modified organisms Regulation on the assessment of environmental risks to the use of GMOs developed and approved by GD		State budget	2025-2026	Ministry of Environment	

	2	3	4	5	6	7	8
	3.3.2 Increase the potential of the reference laboratory, staff trained in continuous monitoring	Equipped reference laboratories				Ministry of Environment	
	3.3.3 Organise increased monitoring of seeds, feed and food to detect consignments contaminated with GMOs.	Monitoring of seeds, feed and food to detect GMO-contaminated batches carried out			2024-2030	Ministry of Environment	ANSA
	3.3.4 Minimisation of environmental risks arising from the use of GMOs	Reduced risks of GMO use			2024-2030	Ministry of Environment	
	3.3.5 Risk assessment of genetic engineering activities (mainly isolated uses of GMOs) and annual risk monitoring for isolated uses.	Evaluation of the genetic engineering activities carried out			2025-2030	Ministry of Environment	
	3.3.6 Organising cooperation between the authorities controlling genetic engineering activities. research institutions and higher education institutions, in particular with regard to research into new techniques for obtaining genetically modified organisms	Cooperation between authorities controlling genetic engineering activities. research institutions and higher education institutions organised				Ministry of Environment Educational institutions	
Direction of action 3.4. ***The trend of erosion of genetic diversity reversed, including by facilitating the use of traditional breeds and varieties and the fair and equitable distribution of benefits from the use of genetic resources ensured.***							
MD target 13. Fair and equitable sharing of benefits from genetic resources in accordance with the provisions of the Nagoya Protocol							

	2	3	4	5	6	7	8
.4	3.4.1 Organising the maintenance and long-term extension of collections held in gene banks and other institutions for the conservation of the gene pool	Long-term maintenance and extension of collections held in gene banks and other organised gene pool conservation institutions		State budget	2025-2030	Ministry of Environment Research Institutions	
	3.4.2 Making preserved plant genetic resources available in ex situ collections and encouraging their conservation and maintenance on farms	Plant genetic resources preserved in ex situ collections made available to agricultural needs		State budget	2025-2030	Ministry of Environment Research Institutions	
	3.4.3 10% increase in the number of batches of plant genetic resources held in public gene banks through collection, propagating material and seed exchange	Number of batches of plant genetic resources held in public gene banks increased by 10%		State budget	2025-2030	Ministry of Environment Environment Agency Research Institutions	
	3.4.4 Raising society's knowledge of genetic resources stored in gene banks by collecting and disseminating users' experience in cultivation, use and marketing	Society's level of knowledge about genetic resources stored in gene banks is high		State budget	2025-2030	Ministry of Environment Research Institutions	

	2	3	4	5	6	7	8
	3.4.5 Establishment of a national in vitro gene bank and in vitro preservation of samples of genetic and reproductive material from all indigenous and endangered species and breeds of agricultural animals	National in vitro gene bank and in vitro preservation of samples of genetic and reproductive material from all species and breeds of agricultural animals created		State budget	2025-2030	Research Institutions	
Specific Objective 4: ***Ensure, by 2030, scientific support in the field of conservation and sustainable use of biodiversity, communication and access to information, as well as the promotion of quality education***							
Action line 4.1 ***Improve knowledge and access to information on the conservation and sustainable use of biodiversity.*** **MD Target 21:** Information and data available for sound decision-making associated with biodiversity conservation **MD target 23.** Ensuring gender equality in the implementation of the framework, in which all women and girls have equal opportunities and capacity to contribute to the three objectives of the Convention							
4.1	4.1.1 Develop and implement measures to encourage sustainable consumption and production in order to reduce pressure on biodiversity.	Developed measures and implementation for sustainable consumption and production.		State Budget / External Assistance	Permanent		Civil society
	4.1.2 Collection and exchange of best practices on the sustainable use of biodiversity	Effective practices in the sustainable use of biodiversity		State Budget / External Assistance	Permanent	Environment Agency	Civil society

	2	3	4	5	6	7	8
	4.1.3 Education for citizens, education for sustainable development, including gender equality and human rights that are mainstreamed at all levels in: (a) national education policies, (b) curricula, (c) teacher training and (d) student assessments	Measures developed and implemented in the education system		State Budget / External Assistance	Permanent	Educational institutions	Civil society
	4.1.4 Popularizing and disseminating scientific results in the field of biodiversity conservation in a form accessible to society	Scientific results in the conservation of disseminated biological diversity		State Budget / External Assistance	Permanent	Educational institutions	Civil society
Direction of action 4.2. ***Monitoring, maintaining, developing and ensuring the continuity of biodiversity databases in the long term.*** **Target MD 20.** Capacity building and development, technology transfer and technical and scientific cooperation for implementation							
.2	4.2.1 Monitoring biodiversity data, information and knowledge available to policymakers and other relevant actors to support policies in planning and decision-making, review and reporting on implementation progress.	Data and available information used for planning and decision-making processes			2025-2030		

	2	3	4	5	6	7	8
	4.2.2 Integrated Biodiversity Information System (Species, flora, fauna, rare species, alien invasive species, protected areas, forest fund, Emerald Network) developed, implemented and managed.	GIS maps elaboration for the cadastre of Species, flora, fauna, rare species, alien invasive species, genetic resources, gene banks, protected areas, forest fund, Emerald Network. Specialized digital cadaries, elaboration, managed, functional and accessible to the public. Prototype of the SII developed and piloted		State Budget / External Assistance	2026	Environment Agency	
	4.2.3 Ensuring systematic storage of and access to monitoring data in a properly regulated framework	Access to monitoring data ensured		State budget	2025-2030	Environment Agency	
	4.2.4 The updated national statistics system with reporting provisions on risk assessment related to biodiversity and measures to reduce negative impacts.	Statistical yearbook completed with respective statistical data published and accessible		State budget	2025-2030	Environment Agency NBS	

	2	3	4	5	6	7	8
Direction of action 4.3. ***Shaping attitudes towards the importance of biodiversity and preserving natural values, raising awareness, development and dissemination.*** **MD22 target:** Ensure the participation, justice and rights of individuals in a healthy environment, including vulnerable categories							
.3	4.3.1 Organizing educational programs in schools and communities. Awareness campaigns on conflicts and wildlife conservation.	Increased awareness in communities, active participation in conservation and conflict management programs.		State budget/external assistance	2024-2030	Environment Agency Educational institutions	
	4.3.2 Developing information and awareness programs on biodiversity for personnel involved in industry and other fields of activity, in order to understand the value of biodiversity that contributes to the well-being of the population.	The number of industry actors and communities that adopt and comply with biodiversity protection requirements.		State budget/business environment		Environment Agency	Business environment

	2	3	4	5	6	7	8
	4.3.3 Raising the level of presentation of the various natural values of the Republic of Moldova by increasing the number of permanent and temporary exhibitions, the availability of educational routes and demonstration sites, as well as the development and availability of related online information materials	Number of permanent and temporary exhibitions organized		State budget/external assistance	2024-2030	Environment Agency Educational institutions	
	4.3.4 Creation of the Eco-School and Green Kindergarten network, preparation and sharing of educational materials, full institutional implementation of education for sustainability in an increasing number of institutions.	Eco-School and Green Kindergarten networks created		State budget/external assistance	2024-2030	Environment Agency Educational institutions	
Direction of action 4.4. ***Strengthen communication and professional cooperation, including at international level, for the conservation and sustainable use of biodiversity with all stakeholders.*** ***MD Target 21:*** *Information and data available for sound decision-making associated with biodiversity conservation*							

	2		3	4	5	6	7	8
.4	4.4.1	Strengthen the transfer of information, the transfer of the latest spatial data and information on biodiversity between scientific actors and nature conservation institutions, as well as specialists involved in conservation management and other relevant sectors.	Number of institutions involved in the exchange of information on biodiversity conservation		State budget/external assistance	2024-2030	Environment Agency Educational institutions	
	4.4.2	Increasing the focus on the field of biodiversity conservation in education and laying the professional foundations for it. Development and implementation of a green education package for students and teachers alike for multiple age groups.	The field of biodiversity conservation emphasised in the education and vocational training system		State budget/external assistance	2024-2030	Environment Agency Educational institutions	
	4.4.3	Launch of teacher training and in-service training courses on integrating biodiversity conservation into school curricula and teaching methods	Trained teachers and biodiversity conservation integrated into school curricula		State budget/external assistance	2024-2030	Environment Agency Educational institutions	
	4.4.4	Developing and implementing joint projects within bilateral and multilateral cooperation, in the fields of conservation management and species research.	Number of joint and multilateral projects in the field of biodiversity conservation management		State budget/external assistance	2024-2030	Environment Agency Educational institutions	

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Specific Objective 5: ***Ensure, by 2030, measures to increase the benefits of the use of natural resources and ecosystem services by increasing the financial commitment to stimulate investments in nature-based solutions***							
Direction of action 5.1. ***Mobilising and ensuring adequate financial means and creating a regulatory environment conducive to biodiversity conservation and supporting it at legal, administrative, central and regional levels.*** **MD Target 14:** The multiple values of biodiversity are integrated into the country's sustainable development policy framework, including at the local level **MD target 16.** Reducing pressure on biodiversity by encouraging the reduction of waste and overconsumption **MD19 target:** Mobilize dedicated financial resources exclusively for biodiversity conservation							

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.1	5.1.1 Mobilising dedicated financial resources exclusively for biodiversity conservation	Creation of the National Biodiversity Fund and development of the institutional regulatory framework Revision of the normative framework that provides for the mechanism for financing biodiversity through the National Environmental Fund, including the related framework, elaboration and development of the legal mechanism for financing biodiversity through the National Biodiversity Fund. 3 public-private partnerships concluded by the state until 2030, which have as object the protection / conservation of biodiversity		State budget/other means	2026	Ministry of Environment Donors	Business environment

	2	3	4	5	6	7	8
	5.1.2 Financing financial resources for forest sector management	Increased value of financial resources (external and internal) allocated to the forestry sector, thousand lei - 1557300.0 (by 2027)		State budget/external assistance		Ministry of Environment Moldsilva Agency	Donors
	5.1.3 Determining the additional resources (e.g. financial, human, technical) that are needed to take action to achieve the objective of increasing benefits from the use of natural resources.	Determined and applied financial, human and technical resources		State budget/external assistance			
	5.1.4 Encouraging the business and financial sectors to reflect biodiversity and its multiple values in decision-making processes.	Biodiversity values reflected in decision-making processes		State budget/external assistance			
	5.1.5 Regular monitoring, assessment and determination of risks, dependent on their impact on biodiversity, including requirements for all large and transnational companies and financial institutions to prolong operations, supply chains and capitalization of their portfolios	Regular assessment and determination of risks, dependent on their impact on the monitored biodiversity		State budget/external assistance			

	2	3	4	5	6	7	8
	5.1.6 Develop measures to encourage and enable companies and financial institutions to take action to progressively reduce negative impacts on biodiversity and enhance their positive effect.	Measures to encourage and enable companies and financial institutions to take action to progressively reduce negative impacts on developed biodiversity					
	5.1.7 Optimal economic model for the transition of the Moldsilva Agency from the current self-financing mechanism to sustainable financing	Analytical report		EU 4Environment (WB)			
	5.1.8 Biodiversity compensation mechanisms, as well as a training programme to strengthen the expertise of central authorities in the effective planning, implementation and monitoring of compensatory measures.	Analytical report with concrete recommendations		EU 4Environment (WB)			
Direction of action 5.2. ***Facilitate the financial contribution of stakeholders in biodiversity conservation by making the most of both public and private funding opportunities.*** **MD Target 15:** Companies assess and disclose biodiversity-related dependencies, impacts and risks and reduce negative impacts							

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.2	5.2.1 Assessment of wetland-generated SEs to maintain the flow of benefits to stakeholders (local communities, tourists, entrepreneurs, farmers, etc.)	$/ha (monetary values per unit area)					
.2	5.2.2 Fully implement EU nature legislation to protect biodiversity; increased protection of ecosystems and increased use of green infrastructure; more sustainable agriculture and forestry; more efficient management of fish stocks; stricter controls of invasive alien species; increasing the EU's financial contribution to combating global biodiversity loss.						
	5.2.3 Identifying and applying governmental and non-governmental funding.	Total amount of funds raised, number of human resources involved					
	5.2.4 Developing a vision of combining economic activities with biodiversity conservation, based on the Lower Prut area	Local Policy Document (Cahul District)		BO KU & Cahul District Administration			

	2	3	4	5	6	7	8
	5.2.5 Forest products web platform to promote sustainable market placement and trade in forest products	Technical Specification Recommendations		EU 4Environment (WB)			
	Direction of action 5.3. ***Liability for causing damage to flora, fauna and habitats is insured.*** **MD Target 18:** Reduce harmful incentives for biodiversity						
.3	5.3.1 Adjustment of the methodology for calculating the damage caused to the environment by violating the legislation in the field of plant and animal kingdom, in accordance with the Law on Environmental Liability	Methodology developed and approved by GD		State budget/foreign assistance	2024	Ministry of Environment	
	5.3.2 Intensify actions to detect and assess damage to biological diversity in natural/anthropogenic, aquatic and terrestrial ecosystems.	Number of cases of damage detected and investigated				Environmental Protection Inspectorate	
	5.3.3 Consolidation/reconfiguration of recording/signaling systems and/or records, as well as anticipation/liquidation of forest fires, disease and pest attacks, forest drying, etc.	Urgent measures to prevent or reduce the adverse effects of natural disasters highlighted and					

	2	3	4	5	6	7	8
	5.3.4 Record and application of measures to reduce air basin pollution, application of coercive measures, which contribute to reducing the damage caused to biodiversity as a result of pollution actions.	Number of damages detected and constraints applied					
	5.3.5 Review of oil extraction in Lake Beleu (RBPJ) with the identification of other alternative energy sources in order to rehabilitate the protected area by natural means (without human intervention)	Study conducted by the NGO community					
	5.3.6 Analysis of domestic consumption of wood products, including an assessment of the ecological and socio-economic effects of illegal logging	Analytical Study & Recommendations for Mitigating the Effects		EU 4Environment (WB)			
	5.3.7 Comprehensive report on sustainable forest management (SFM) and legal timber trade, including the prototype of the Timber Tracking System (WTS)	Study & Recommendations		EU 4Environment (WB)			