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# IMPLEMENTATION PLAN

for the  
Strategic Framework  
for Adaptation to Climate Change  
in the Dniester River Basin

Geneva • Kyiv • Chisinau • Vienna  
2017

Mohyliv-Podilskiy

Vadul lui Voda

Chisinau

Tiraspol

Odesa



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## LIST OF ABBREVIATIONS

<b>E5P</b>	Eastern Europe Energy Efficiency and Environment Partnership
<b>EBRD</b>	European Bank for Reconstruction and Development
<b>ENVSEC</b>	Environment and Security Initiative
<b>EU</b>	European Union
<b>FAO</b>	Food and Agriculture Organization of the United Nations
<b>GEF</b>	Global Environment Facility
<b>GIS</b>	Geographic information system
<b>INDC</b>	Intended Nationally Determined Contribution
<b>IWRM</b>	Integrated Water Resources Management
<b>KfW</b>	Credit Reconstruction Bank (German Development Bank)
<b>NEFCO</b>	Nordic Environment Finance Corporation
<b>OECD</b>	Organisation for Economic Co-operation and Development
<b>OSCE</b>	Organization for Security and Co-operation in Europe
<b>UN</b>	United Nations
<b>UNDP</b>	United Nations Development Programme
<b>UNECE</b>	United Nations Economic Commission for Europe
<b>UNEP</b>	United Nations Environment Programme
<b>UNFCCC</b>	United Nations Framework Convention on Climate Change
<b>UNIDO</b>	United Nations Industrial Development Organization

# 01

## 01. INTRODUCTION

Prepared as part of a project of the United Nations Economic Commission for Europe (UNECE) and the Organization for Security and Co-operation in Europe (OSCE), with the support of the European Union and the Austrian Government, the Strategic Framework for Adaptation to Climate Change in the Dniester River Basin identifies actions that need to be taken in the Dniester basin to prepare for the most likely impacts of climate change on conditions in the basin, arising from changes in processes in the aquatic environment. By the middle of the 21st century, these changes are expected to include:

- an increase in the flow of water and in the intensity of flooding;
- a gradual decline in the volume of water resources available, especially during periods of low water levels in tributaries of the Dniester;
- a corresponding decline in water quality;
- further deterioration in the condition of aquatic and wetland ecosystems, particular-

ly in the lower reaches of the Dniester, including the delta.

Taking into account the views of a broad range of stakeholders, the Strategic Framework proposes a package of concrete adaptation measures in the Dniester basin. These proposals are the outcome of analytical work by specialists from Moldova, Ukraine and international organizations, and several years of consultations through the bilateral Working Group on Flood Management and Climate Change Adaptation in the Dniester River Basin.

While the Strategic Framework is not a legally binding document or official intergovernmental action plan, it does outline the consensus among organizations and specialists in the basin about what needs to be done to mitigate the expected adverse impacts of climate change and it offers a range of ideas for implementation.

Given the current economic environment, when even state programmes adopted at the governmental level are suffering from a shortage of financial resources and funding delays, one

can hardly expect the immediate allocation of significant targeted funding for adaptation in the Dniester basin. Many of the proposed adaptation measures are also measures that are necessary to some degree or another for the normal integrated management of the Dniester basin and for the performance of regular measures to protect against flooding, reduce water consumption, improve water quality and preserve and restore ecosystems of watersheds and water bodies in the basin. In this connection, the Strategic Framework merely notes that these actions are important for timely adaptation to climate change, while some of the specific parameters will need to be adjusted taking into account the likely trends and magnitude of climate change.

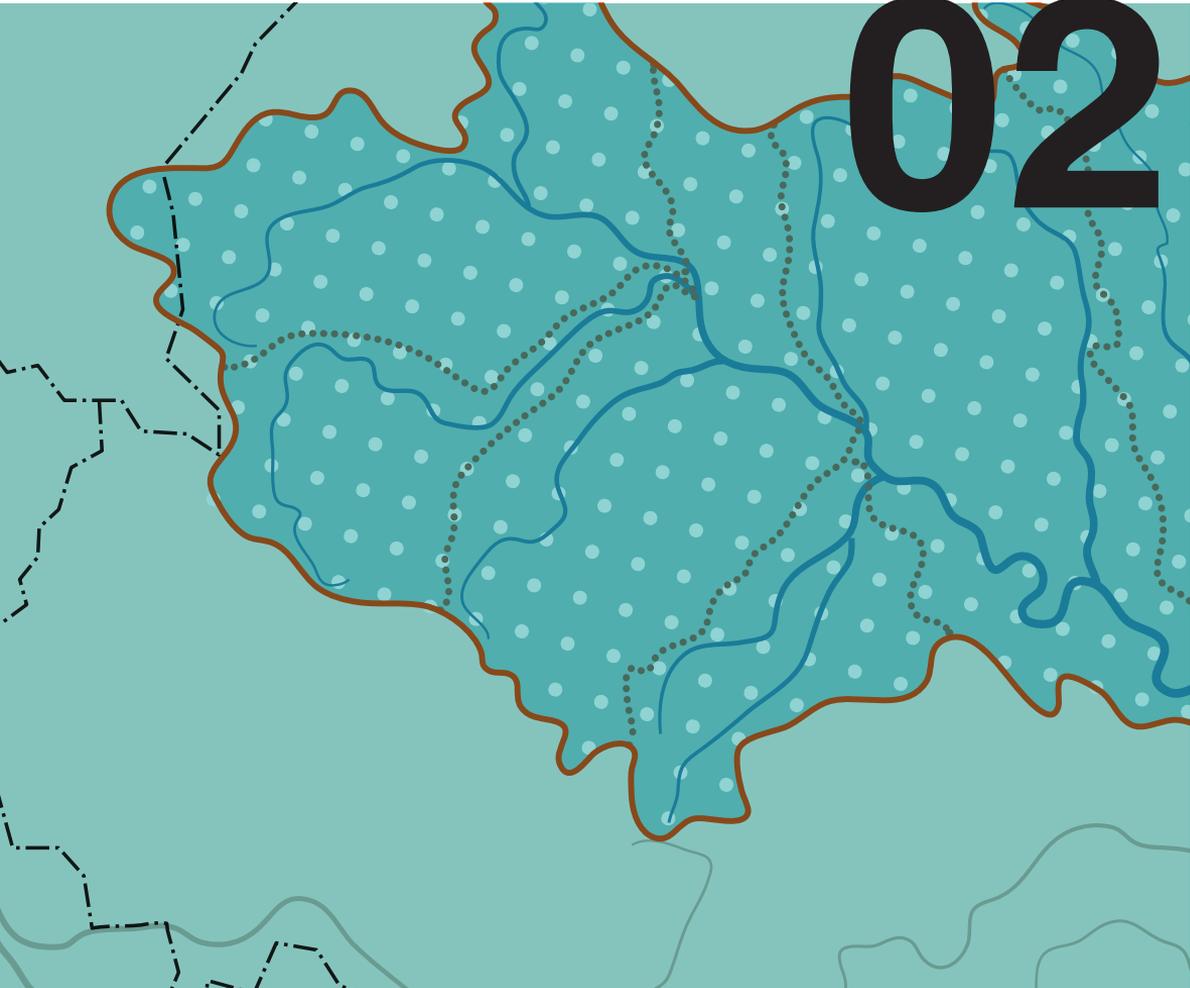
In part, the proposed measures integrate and define in greater detail the actions specified in various state programmes, identifying priorities and promoting consistency among actions for the entire basin.

Furthermore, information about climate change and its consequences is still marked by uncertainty, and ideas in this field are constantly evolving and being refined. In accord-

ance with this trend, both the set of adaptation actions itself and the details involved in the implementation of concrete measures also need to be reviewed and updated regularly. Therefore, efforts aimed at implementation of the recommendations contained in the Strategic Framework consist not so much of the drafting and execution of a new comprehensive programme of independent actions, but rather the organization of a process for the systematic tracking of trends and changes, and the ongoing placement of “climate emphases” in existing and prospective programmes in the Dniester basin, Moldova and Ukraine, in individual sectors and regions, and also within the context of international cooperation.

This activity can be carried out only through joint efforts by the interested agencies, organizations and specialists in Moldova and Ukraine in cooperation with the international community. The Implementation Plan for the Strategic Framework for Adaptation to Climate Change in the Dniester River Basin looks at mechanisms for this kind of cooperation and for the attraction of funding for the practical implementation of the proposed measures.

# 02



## **01. OVERVIEW OF CLIMATE CHANGE ADAPTATION MEASURES IN THE DNIESTER BASIN**

The package of coordinated adaptation measures proposed in the Strategic Framework is summarized in Table 2.1. In addition to the groups of measures covering adaptation based on the four identified areas of climate change impacts on conditions in the basin (reduction in losses from flooding, water scarcity, deterioration in water quality, support for and restoration of ecosystems), measures of a general nature were also proposed to enhance the effectiveness of adaptation and cooperation in the basin as a whole.

Within the context of the preparation of the Implementation Plan for adaptation measures, specialists from Moldova and Ukraine performed an analysis of the structure and sequence of the actions, their cost, and the implementation instruments required for each of the measures, including the existence of analogous measures and parallel financing in existing or prospective plans, projects and programmes (the results of this work are presented in Annex I).

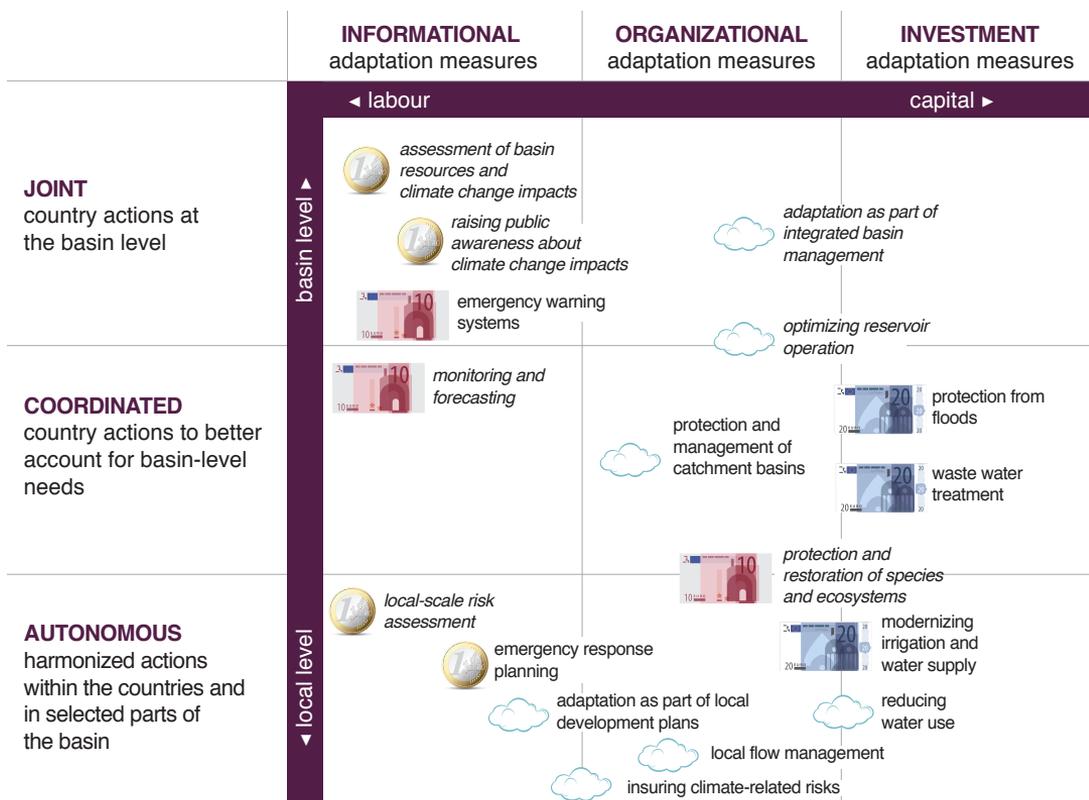
**Table 2.1. Strategic Framework for Adaptation to Climate Change in the Dniester River Basin and groups of proposed measures**

Risk forecasting and analysis measures	Risk prevention and reduction measures	Remediation measures
<b>Reduction in losses from extreme flooding</b>		
<ul style="list-style-type: none"> <li><input checked="" type="checkbox"/> <input checked="" type="checkbox"/> improved monitoring and forecasting of flow and information sharing</li> <li><input checked="" type="checkbox"/> inventory of flood protection infrastructure</li> <li><input type="checkbox"/> analysis and mapping of flood risk</li> </ul>	<ul style="list-style-type: none"> <li><input checked="" type="checkbox"/> <input checked="" type="checkbox"/> updating and observance of rules for the operation of the Dniester's system of reservoirs</li> <li><input checked="" type="checkbox"/> updating of flood protection plans</li> <li><input checked="" type="checkbox"/> restoration and optimization of the system of flood protection structures and culverts</li> </ul>	<ul style="list-style-type: none"> <li><input checked="" type="checkbox"/> <input checked="" type="checkbox"/> providing the public and local authorities with timely information about the danger of flooding</li> <li><input type="checkbox"/> updating and implementation of emergency response plans</li> <li><input type="checkbox"/> insurance of risks (including insurance provided with government support)</li> </ul>
<b>Reduction in losses from water scarcity</b>		
<ul style="list-style-type: none"> <li><input checked="" type="checkbox"/> analysis of the water balance in the basin</li> <li><input checked="" type="checkbox"/> <input checked="" type="checkbox"/> improved monitoring and forecasting of flow and information sharing</li> <li><input checked="" type="checkbox"/> <input checked="" type="checkbox"/> assessment and monitoring of the condition of forests</li> </ul>	<ul style="list-style-type: none"> <li><input checked="" type="checkbox"/> <input checked="" type="checkbox"/> updating and observance of rules for the operation of the Dniester's system of reservoirs</li> <li><input checked="" type="checkbox"/> protection and restoration of forests and shoreline vegetation</li> <li><input type="checkbox"/> optimization of the regulation of flow at the local level</li> <li><input type="checkbox"/> reduction in water consumption and losses</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> modernization of irrigation systems</li> <li><input type="checkbox"/> diversification and modernization of water supply systems for population centres</li> <li><input type="checkbox"/> insurance of risks (including insurance provided with government support)</li> </ul>
<b>Reduction in losses from a deterioration in water quality</b>		
<ul style="list-style-type: none"> <li><input checked="" type="checkbox"/> <input checked="" type="checkbox"/> improved monitoring and forecasting of flow and information sharing</li> <li><input checked="" type="checkbox"/> improved monitoring of water quality</li> </ul>	<ul style="list-style-type: none"> <li><input checked="" type="checkbox"/> improvement of wastewater treatment systems</li> <li><input checked="" type="checkbox"/> protection and regulation of the use of catchment basins and water protection zones</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> improvement of water treatment and distribution systems</li> <li><input type="checkbox"/> diversification and modernization of water supply systems for population centres</li> </ul>
<b>Support for and restoration of aquatic and wetland ecosystems and species</b>		
<ul style="list-style-type: none"> <li><input checked="" type="checkbox"/> analysis of ecosystem services at the basin level</li> <li><input checked="" type="checkbox"/> <input checked="" type="checkbox"/> improved monitoring of ecosystems and biological resources and transboundary information sharing</li> </ul>	<ul style="list-style-type: none"> <li><input checked="" type="checkbox"/> <input checked="" type="checkbox"/> updating and observance of rules for the operation of the Dniester's system of reservoirs</li> <li><input type="checkbox"/> <input type="checkbox"/> regulation of activities within floodplains and wetlands</li> <li><input checked="" type="checkbox"/> <input type="checkbox"/> expansion and strengthening of the network of protected areas and ecological corridors</li> <li><input checked="" type="checkbox"/> <input type="checkbox"/> combating poaching and invasive species</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> <input type="checkbox"/> restoration of shoreline forests, meadows and wetlands</li> <li><input type="checkbox"/> <input type="checkbox"/> restoration of habitats, spawning grounds and fish stocks</li> </ul>
<b>General measures for adaptation and development of cooperation in the basin</b>		
<ul style="list-style-type: none"> <li><input checked="" type="checkbox"/> systematic analysis and forecasting of climate change and its impacts in the Dniester basin</li> </ul>	<ul style="list-style-type: none"> <li><input checked="" type="checkbox"/> consideration of adaptation needs in long-term Integrated Water Resources Management (IWRM) plans</li> <li><input checked="" type="checkbox"/> providing information about climate change challenges in the basin</li> <li><input type="checkbox"/> inclusion of adaptation needs in socioeconomic development plans for sectors and territories</li> </ul>	

Designation of mechanisms for implementation of the proposed adaptation measures:

- JOINT** actions by countries at the basin level (transboundary cooperation required) – coordination of and direct support for adaptation measures requiring direct cooperation among countries and parts of the basin, including the initiation of and support for measures at the level of individual countries and sections of the basin that are being carried out in the interests of the basin as a whole.
- COORDINATED** actions by countries in order to do a better job of protecting the interests of the basin as a whole (transboundary cooperation desirable) – coordination, assistance and partial support for the coordinated implementation of adaptation measures at the level of individual countries and sections of the basin that could have an impact on other countries and administrative units within the basin.
- AUTONOMOUS** harmonized actions in countries and individual sections of the basin (transboundary cooperation useful) – sharing of positive and negative experience at the basin level; initiation of and limited assistance for general measures at the level of individual countries and sections of the basin that are being carried out on a common methodological, organizational and financial basis.

**Figure 2.1. Classification of adaptation measures by target area, category and approximate cost**



The overall cost of the development and implementation of adaptation measures in the basin is estimated at around 235 million euros (Table 2.2). Approximately 40 per cent of the spending needed is related to flood protection measures, while around one fourth is related to the preservation and restoration of vulnerable and valuable ecosystems in the basin. Some 90 per cent of the total funding is intended for short-term (3-5 years) and medium-term (up to 10 years) actions, with the rest designated for long-term actions. This is due to the relatively high environmental and socio-economic vulnerability of the region, the limited adaptation capacities of its ecosystems, the length of time required for the formation of systemic components, and therefore the need to begin preparing now for the conditions that are expected to arise.

It is important to note that the analysis that was performed allows for a cost estimate with an accuracy of no more than an order of magnitude. The practical design and implementation of adaptation measures will require further clarification of their parameters and cost, with the involvement of the relevant organizations and experts. Specifically, the cost estimate for adaptation measures related to water consumption still appears to be somewhat low (including the use of water in agriculture, drainage, and wastewater treatment).

Approximate cost of basin-focused adaptation measures:

-  less than 1 million euros
-  1 to 10 million euros
-  more than 10 million euros
-  additional information and analysis are required

Source: ENVSEC, UNECE, OSCE. Strategic Framework for Adaptation to Climate Change in the Dniester River Basin. Vienna — Geneva, 2015.

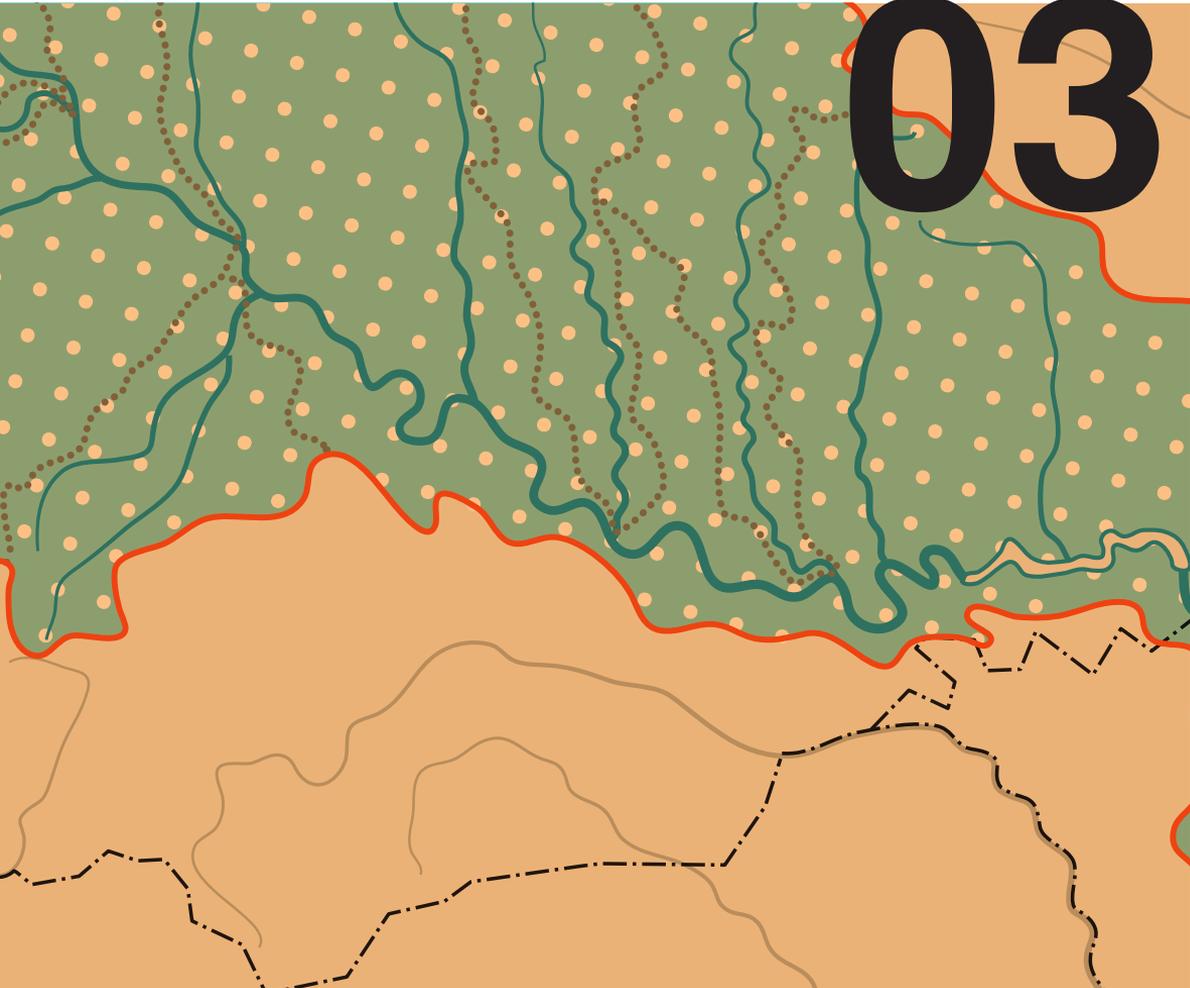
Based on the data that have been collected, approximately 10 per cent of the total cost of the required actions (as much as 30-40 per cent within certain groups of adaptation measures) may be covered by other programmes and projects that are already in place or are still in the preliminary planning stages (see Annexes I and II). In practice, however, government programmes are only partially funded, while international projects do not always proceed along the path originally planned. For this reason it is important to constantly update parallel financing data and parameters. For example, one can expect that over the medium term additional support for the implementation of European Union legislation in Moldova and Ukraine, flood protection measures in Moldova with funding from the European Investment Bank, and new World Bank and Global Environment Facility projects will help to address some of the adaptation challenges in the Dniester basin, although the exact parameters of the relevant financial instruments were not yet known at the time the analysis was performed.

The values are rounded and the estimate does not take into account expenditures on infrastructure maintenance and other current spending.

**Table 2.2. Estimated cost of climate change adaptation measures in the Dniester basin**

Adaptation measures	millions of euros
Improved monitoring and forecasting of flow and information sharing	13.3
Analysis and mapping of flood risk	1.6
Inventory of flood protection infrastructure	4.5
Updating of flood protection plans	11.1
Restoration and optimization of the system of flood protection structures and culverts	96.5
Updating and implementation of emergency response plans	9.3
Providing the public and local authorities with timely information about the danger of flooding	1.5
Introduction of a climate risk insurance system	0.1
Updating and observance of rules for the operation of the Dniester's system of reservoirs	0.4
Reduction in water consumption and losses and modernization of irrigation systems	2.2
Improved monitoring of surface and groundwater quality	1.2
Improvement of drainage and wastewater treatment systems	22.7
Upgrading and diversification of water treatment and supply systems	2.0
Protection and regulation of the use of water protection zones	1.3
Optimization of the regulation of flow at the local level	2.2
Protection and restoration of forests	21.2
Improved monitoring and assessment of ecosystems and biological resources	5.0
Analysis of ecosystem services at the basin level	1.0
Regulation of activities within floodplains and wetlands	10.8
Expansion and strengthening of the network of specially protected natural areas and ecological corridors	12.2
Combating poaching and invasive species	6.1
Protection and restoration of shoreline, wetland and aquatic ecosystems	7.9
Analysis and forecasting of climate change and its impacts in the basin	0.3
Inclusion of adaptation needs in IWRM plans and development plans for sectors and territories	0.9
Dissemination of information about climate change challenges in the basin	0.2

**TOTAL: 235 million euros**



# 03

## 03. MECHANISMS FOR THE IMPLEMENTATION AND FINANCING OF ADAPTATION MEASURES

### 3.1 Integrated transboundary management of the Dniester basin

Under the strategic plan, adaptation measures in the basin should become an integral “climate” component of joint efforts by Moldova and Ukraine aimed at the integrated management of the Dniester basin as a whole. The joint development and subsequent ongoing implementation of this plan will be possible and most likely in the event that the Treaty between the Government of the Republic of Moldova and the Cabinet of Ministers of Ukraine on Cooperation on the Conservation and Sustainable Development of the Dniester River Basin enters into force. The body provided for under this treaty, the Commission on Sustainable Use and Protection of the Dniester River Basin, whose responsibilities will include the coordination of water management and environmental protection activities at the basin lev-

el, is the mechanism most suited for the comprehensive development, coordination and implementation of climate change adaptation measures as part of the basin's management. This process should also include a regular review of adaptation targets and measures, taking into consideration new information, experience and results obtained.

From this perspective, support for the signing of the treaty, the creation of the commission and the launching of integrated planning in the basin is one of the top priorities in the development of the institutional framework for climate change adaptation in the Dniester basin. This will require the continuation of and all-round support for consultations between the governments of Moldova and Ukraine in order to complete the treaty ratification process. Following its entry into force, concerted efforts will be needed by the parties to the treaty and the international community to build and develop the organizational, administrative and personnel structure for joint work. The climate component should be assigned the importance it deserves in this structure and climate change issues should be included systematically in the work of the commission and in the integrated management of the basin.

At the same time, and prior to the entry into force of the basin treaty in particular, the exist-

ing mechanisms for cooperation between Moldova and Ukraine need to be utilized directly in certain target areas that involve joint efforts by authorized agencies of both countries:

- hydrometeorological services – sharing of information and forecasts;
- water resources management agencies – cooperation in water resources management, flood protection, operation of hydraulic engineering facilities;
- environmental protection agencies – transboundary cooperation involving the protection of natural resources, development of a system of protected areas and so on;
- agencies for dealing with emergency situations – cooperation in the prevention of emergencies and the sharing of information in the event of emergencies.

A systematic review of adaptation issues in the Dniester basin on a bilateral basis will allow for the optimization of relevant transboundary cooperation plans and programmes, including efforts that involve the attraction of external funding sources for additional actions aimed directly at addressing challenges in the basin.

Among these mechanisms, the competent authorities of the governments of Moldova and Ukraine responsible for the implementation of the 1994 agreement on cooperation in the

use and protection of boundary waters and the bilateral working groups operating under the aegis of this agreement have a special role to play. Although this mechanism was not originally intended for systematic, integrated work with specific basins, in practice the competent government authorities and the working groups regularly deal with problems of the Dniester basin and, in the absence of integrated management mechanisms, could assume to some extent a coordinating role in climate change adaptation in the basin, which would then be turned over gradually to the basin commission at some point in the future.

In light of the special significance of the Dniester reservoir hydropower complex in climate change adaptation, it is important to strengthen the climate component of reservoir management: over the long term through the consideration in the reservoir operating rules of long-term climate trends and changing needs of water users for the regulation of flow (particularly in the lower reaches of the Dniester); and over the short term through the consideration of changes that are already manifesting themselves (increased fluctuations in flow, downward trends in minimum flow and so on) in decisions by the Interagency Commission on Establishment of the Operating Regimes of the Dnieper and Dniester Reservoirs under the Ukrainian State Water Resources Agency.

## **Actions to implement the Strategic Framework and adaptation measures and responsible parties**

- Support for the entry into force of the basin treaty and due consideration of climate dimensions in the integrated plan for the management of the Dniester basin (competent and interested agencies and organizations, and the basin commission following the treaty's entry into force)
- Inclusion of Dniester basin adaptation issues in the agendas and programmes of working groups within the framework of the 1994 agreement, partial coordination of adaptation (competent government authorities responsible for implementation of the agreement on cooperation in the use and protection of boundary waters)
- Inclusion of Dniester basin adaptation issues in bilateral cooperation programmes focused on certain target areas (agencies responsible for transboundary cooperation within the framework of agreements between Moldova and Ukraine)
- Consideration of climate change trends and possible changing needs for the regulation of flow in updated rules for the operation of Dniester reservoirs (organizations and agencies participating in the development and coordination of operating rules)
- Increased attention to climate dimensions when determining the annual release regime (organizations and agencies participating in the work of the Interagency Commission on the Establishment of Reservoir Operating Regimes)

## 3.2 European Union Association Agreements

Another promising direction for ensuring an institutional and financial foundation for adaptation in the Dniester basin over the long term is work within the context of the association of Moldova and Ukraine with the European Union and the countries' compliance with the relevant EU directives.

In the process of complying with the European Union Water Framework Directive, Moldova has already embarked on the drafting of a management plan for the Moldovan part of the Dniester basin (Ukraine will be undertaking this work in the near future). Specifically, the six-year plan for management of the Moldovan part of the basin calls for:

- creation of the conditions to prevent further deterioration of the status of surface and groundwater;
- protection and improvement of surface and groundwater so that their status is rated as "good" by 2030;
- gradual decline in the pollution of surface and groundwater.

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The proposed adaptation measures for the basin include many of these dimensions, while the climate dimensions are already being taken into consideration in Moldova in the development of the management plan's content and actions.

One of the requirements of the EU Water Framework Directive is that the situation and interests of other countries in transbounda-

ry river basins be taken into consideration in the development and implementation of management plans for parts of these basins. This opens up real, albeit limited, opportunities to strengthen transboundary coordination and coordinated planning of basin policy, even when working within the borders of individual countries. Regular coordination of management plans for the Moldovan and Ukrainian parts of the Dniester basin, accompanied by

**Table 3.1. Connection between certain European directives and the Strategic Framework for Adaptation to Climate Change in the Dniester River Basin**

Directive (abbreviated title)	No.	F	S	Q	E	G
Water Framework Directive	2000/60/EC	●	●	●	●	●
Floods Directive	2007/60/EC	●				
Urban Waste Water Directive	91/271/EEC			●		
Drinking Water Directive	98/83/EC			●		
Nitrates Directive	91/676/EEC			●		
Industrial Emissions Directive	2010/75/EU			●		
Major Accident Hazards Directive	96/82/EC			●		
Waste Framework Directive	2008/98/EC			●		
Mining Waste Directive	2006/21/EC			●		
Landfill Directive	1999/31/EC			●		
Birds Directive	2009/147/EC				●	
Habitats Directive	92/43/EEC				●	

The size of the symbol is proportional to the importance of the problem in the relevant directive.

Target areas for adaptation activities: F – floods, S – water scarcity, Q – water quality, E – ecosystems, G – general measures

consideration of climate dimensions, should become an additional effective mechanism for the implementation of concrete adaptation measures. This practice will also be important in supporting a joint Moldovan-Ukrainian management plan within the context of the new basin treaty (see Section 3.1).

Similarly, in the implementation of the EU Floods Directive countries need to coordinate their activities with their basin neighbours and avoid activities that could be damaging to other countries. The directive also requires that long-term trends, including climate change, be taken into consideration when performing assessments.

In addition to those referred to above, there are more than 10 other directives included in the Association Agreements that have a direct or indirect connection to adaptation challenges in the Dniester basin, and specifically those concerning pollution and water quality, waste water and industrial safety, and preservation of biological species and ecosystems (Table 3.1). Performance of the actions provided for under many of these directives will simultaneously help to address adaptation tasks in the Dniester basin and contribute to the implementation of some of the proposed measures (for example, it is assumed that compliance with the habitats directives will heighten the

responsibility of government authorities at various levels for the status of the most valuable shoreline ecosystems).

Climate change issues (for example, organization of trading in greenhouse gas emissions) are included explicitly in a number of the Association Agreement provisions, in particular in the context of the development and strengthening of cooperation in this area. And although from the standpoint of the formal implementation of the agreements, direct consideration of climate adaptation issues is not mandatory, it certainly makes sense in order to boost the long-term effectiveness of the measures, and in this regard it is extremely important. “Climate analysis” of all sorts of plans and programmes for economic development, environmental protection, etc., is being introduced more and more broadly in the European Union and throughout the world as a whole. As in other similar situations (such as strategic environmental assessments, or SEAs), the application of this sort of analysis is most effective at the early planning stages, and it makes sense to employ it when planning the implementation of the relevant European Union directives, among other things.

### **Actions to implement the Strategic Framework and adaptation measures**

- Inclusion of climate change issues in plans for the implementation of the EU directives on water policy and on the assessment and management of flood risks, as well as transboundary coordination of river basin management plans and activities within the context of these plans (environmental protection and water management agencies)
- Consideration of climate change issues and proposed adaptation measures in the Dniester basin in plans for the implementation of other EU directives (agencies responsible for the implementation of other EU directives and the coordination thereof)
- Lobbying for the consideration of climate dimensions and interests of the Dniester basin in the implementation of EU directives (interested organizations and agencies)

### 3.3 National, sectoral and local development programmes

Although the funding status of national and sectoral programmes is far from stable in both Moldova and Ukraine, these programmes continue to be real instruments for concrete action, including action in the adaptation arena.

As with the EU directives, taking full advantage of the opportunities offered by national and regional plans and programmes that are already in place and that are under development requires meticulous analytical work to identify those elements which are directly or potentially related to climate change adaptation in the Dniester basin (preliminary work in this area has already been done in the process of drafting this document – see Annexes I and II). The practical implementation of even some of the measures planned under the relevant programmes could help to address many of the adaptation tasks in the basin. Other measures may require that adjustments be made, including those that take into account expected climate change effects. For example, protection measures and structures that have been designed on the basis of historical flooding in the basin will not be able to perform their functions fully given an increase in water volumes and increased frequency of flooding as a result of climate change, and therefore the hydrological

characteristics, and consequently the parameters, of flood-control measures and structures need to be adjusted in order to take into account climate change impacts. Given a chronic shortage of budget funding, the introduction of changes of this kind in state programmes that have already been adopted and are currently in effect is realistic only if additional funding sources are made available, including those that draw on external mechanisms (see Section 3.5). This work requires ongoing cooperation between agencies and organizations that are stakeholders in adaptation in the Dniester basin and agencies and organizations that are responsible for the design and implementation of the relevant plans and programmes.

Similar work is needed with the administrations of individual territories (provinces, districts, population centres) within the basin that have their own socioeconomic and sectoral development programmes and plans. As part of this process, special attention should be given in the Dniester basin to the sections in the middle and lower reaches of the river that are the most vulnerable to the effects of climate change, including Odesa Oblast in Ukraine and the Transnistria region in Moldova. Given a sufficient understanding of the importance of adaptation – or the relevant decisions or recommendations by central government authorities – local and regional authorities and cen-

tral government units are often able to seek out local, private and other resources to allow for the inclusion of climate change issues in the development plans for their territories. (In Ukraine, for example, as a result of administrative-territorial reform to strengthen the authorities of local self-government bodies, the budgets of communities that have been merged will become in the near future the main sources of funding for practical activities, including climate change adaptation.)

Basin management agencies that have an objective interest in an integrated and coordinated approach to challenges in the Dniester basin also play a major role. The inclusion of climate change adaptation in their work programmes and regular transboundary coordination of the management of different parts of the shared Dniester basin (including efforts involved in compliance with EU legislation – see Section 3.2) will contribute to a significant improvement in the organizational and financial sustainability of this work.

## **Actions to implement the Strategic Framework and adaptation measures**

- Inclusion of climate change adaptation measures in the Dniester basin in national and sectoral plans and programmes that are already in place and that are under development (agencies that are responsible for the design, implementation and coordination of national and sectoral plans and programmes, in conjunction with environmental protection and water resources management agencies)
- Inclusion of climate change adaptation measures in local development plans and programmes within the Dniester basin (local government authorities, in conjunction with national environmental protection and water resources management agencies and their regional and basin offices)
- Lobbying for climate dimensions and interests of the Dniester basin in the design and implementation of national, sectoral and local plans and programmes (interested organizations and agencies)

### 3.4 Climate change and adaptation policy

Moldova and Ukraine are pursuing government policies in the area of climate change and are participating in processes linked to the United Nations Framework Convention on Climate Change (UNFCCC). Among other things, both countries officially submitted their Intended Nationally Determined Contributions (INDCs) in advance of the 21st Conference of the Parties in Paris in December 2015 (see Table 3.2).

Up until recently, the primary focus under the UNFCCC was on reducing greenhouse gas emissions, and both countries are now working on “low-carbon” development prospects and plans up to 2030. At the same time, Moldova and Ukraine are studying strategic and practical adaptation issues.

The Climate Change Adaptation Strategy up to 2020 was adopted in Moldova in 2014, and the cost of its implementation is estimated at US\$200 million. The strategy is intended to address three tasks:

- the creation by 2018 of administrative and organizational mechanisms in the area of climate change that will support effective adaptation in the country as a whole, in specific sectors and at the local level;

- the creation by 2020 of a mechanism for observing the effects of climate change and socioeconomic processes that are vulnerable to climate change, and also for the collection and dissemination of information on related problems;
- support for resilience to climate change and assistance in adaptation in six key sectors (agriculture, water resources, forestry, health care, energy and transportation).

A conceptual plan for climate change adaptation in Moldova’s water supply and sanitation sector was drafted previously with the assistance of the Organisation for Economic Co-operation and Development (OECD) (although it did not become a national programme).

On the whole, considering the exceptional importance of the Dniester for Moldova and the significant proportion of the country’s territory that is occupied by the Dniester basin, a large share of any general adaptation measures in Moldova in the future will inevitably take in the interests of the Dniester basin as well.

In its INDCs, Ukraine has emphasized the importance of adaptation, assigning it the same weight as reducing greenhouse gas emissions over the medium term. Owing to a shortage of funding, however, the third edition of the National Climate Change Adaptation Strategy

has not been completed. Nevertheless, following the ratification of the Paris Agreement, the Conceptual Plan for the Implementation of Government Climate Change Policy was drafted and it was approved in December 2016. Among other things, implementation of the conceptual plan will allow for:

- the drafting and implementation of a medium-term climate change adaptation strategy;
- an increase in the effectiveness of adaptation efforts aimed at mitigation of current and expected adverse climate change impacts, including those caused by a change in the frequency and intensity of extreme weather events and natural disasters;
- enhanced capacity of local executive government and self-government authorities to develop and implement climate change adaptation measures within their own territories.

Approval of the conceptual plan and the subsequent drafting of the strategy, accompanied by the draft climate change adaptation plan that has already been prepared, to a significant extent will provide an opportunity for consideration of the challenges facing the Dniester and specific recommendations for adaptation in the basin. Systematic government financing of adaptation activities remains problematic, however. One solution could be the accumula-

tion of the necessary resources in earmarked funds. Ukraine has experience with the creation of such funds, for example, in the energy efficiency sphere (an earmarked energy efficiency fund was created in July 2016, with the proposed mobilization of resources for this fund from both the state budget and international technical and financial assistance). In the event of the creation of an “earmarked climate fund”, it could be supported, among other things, by the environmental tax on businesses, which already includes a charge for carbon dioxide, methane and nitrous oxide emissions (this would require an updating of the mechanism for the assessment of the tax with respect to greenhouse gases and the implementation of mechanisms for the targeted use of the funds collected), and international assistance. This would allow for the collection of sufficient funds to support the implementation of integrated climate change programmes, including the Strategic Framework for Adaptation to Climate Change in the Dniester River Basin.

At the local level, starting in 2012 systematic efforts were undertaken in Ukraine to inform oblast government authorities about the potential consequences of climate change and to prepare methodological recommendations re-

garding adaptation. In the area of adaptation, nongovernmental organizations are also working at the local level: the National Environmental Centre prepared an analysis of problems and possible adaptation actions for a number of Ukrainian cities, including Odesa and Lviv. In the Transnistria region of Moldova, nongovernmental organizations and the United Nations Development Programme (UNDP) have identified approaches to regional adaptation. As is the case with regional programmes of a general nature (see Section 3.3), consideration of the needs of the Dniester in future local climate change adaptation plans is one of the mechanisms for jointly addressing common issues, and for the financing and implementation of the relevant measures.

**Table 3.2. Elements of the Intended Nationally Determined Contributions of Moldova and Ukraine**

	Moldova	Ukraine
<b>Commitment to reduce emissions</b>	By 64-67% (or up to 78%) relative to the 1990 level	< 60% relative to the 1990 level
<b>Cost of emissions reduction</b>	US\$4.9 billion-US\$5.1 billion up to 2030 to reduce emissions by 78% relative to the 1990 level	Not specified
<b>Financing of emissions reduction</b>	International, which will partially determine the potential actions	Not specified
<b>Adaptation to climate change</b>	A description of the strategy and action plan for climate change adaptation is included in the annex	Separate section, over the medium term adaptation is equal in importance to emissions reduction
<b>Cost of adaptation to climate change</b>	US\$200 million	Not specified
<b>Financing of adaptation to climate change</b>	Domestic and international financing, access to UNFCCC mechanisms	Not specified
<b>Assessment and review of country's commitments in the future</b>	Within the context of the collective UNFCCC process	Following restoration of territorial integrity and adoption of socioeconomic development strategies for the period after 2020, taking into account the attraction of investments

**Actions to implement the Strategic Framework and adaptation measures**

- Inclusion of measures in the Dniester basin in national climate change adaptation plans and programmes that are already in place and that are under development (agencies that are responsible for the design, implementation and coordination of national and sectoral climate change adaptation plans and programmes)
- Initiation of the creation of new targeted financing mechanisms in the countries for activities in the area of climate change (agencies that are responsible for government financial policy and climate change policy, other interested agencies)
- Inclusion of measures in the Dniester basin in local climate change adaptation plans and programmes (local government authorities within the basin, in conjunction with national environmental protection, water resources management and other agencies and their regional offices)
- Lobbying for the interests of the Dniester basin in national, sectoral and local plans and programmes (other interested organizations and agencies)

Moldova's INDCs cover the entire territory of the country, including the left bank of the Dniester.  
 Source: <http://klimalog.die-gdi.de/#INDCContentExplorer>, amended and updated.

### 3.5 International cooperation and technical assistance

Global international agreements, and specifically the Paris Agreement under the UNFCCC, the Sendai Framework for Disaster Risk Reduction 2015-2030, and the 2030 Agenda for Sustainable Development, stress the importance of regional cooperation in the area of climate change adaptation, in reducing the danger of natural disasters and damage from them, and also in the management of water resources. In this context, international financing for actions in transboundary river basins is of growing importance.

When there is a state budget deficit, international cooperation and technical assistance are frequently viewed as the only mechanism for raising funds for environmental protection and infrastructure programmes and projects. Although this is not what it is essentially intended to be – over the long term only a country's own funds and those of its population can serve as a stable financing source – in practice international cooperation does indeed play an important role in transition economies with challenging socioeconomic conditions. This role will continue in the foreseeable future, and cooperation between Moldova and Ukraine and countries and organizations outside the basin, and their participation in international and regional programmes (Table 3.3) will remain an important source of funding for the implementation of the Strategic Framework and adaptation measures in the Dniester basin.

**Table 3.3. Overview of the capacity of certain international funding mechanisms to support climate change adaptation**

Funding mechanisms	Support for adaptation measures:		
	informational	organizational	investment
<b>International (multilateral) organizations and programmes</b>			
UN programmes and mechanisms	●	●	●
UNFCCC mechanisms*	●	●	
Global Environment Facility (GEF)*	●	●	●
OSCE	●	●	
<b>Investment banks</b>			
World Bank	●	●	●
European Investment Bank	●	●	●
EBRD	●	●	●
Climate investment funds*	●	●	●
<b>Foreign (bilateral) programmes</b>			
Austria	●	●	●
United Kingdom	●	●	
Germany	●	●	●
United States	●	●	
Finland	●	●	
Switzerland	●	●	
Sweden	●	●	●
European Union	●	●	●

The size of the symbol indicates the level of likely support for adaptation measures provided by the respective funding mechanism.

\* See Table 3.4 for a more detailed analysis.

International mechanisms that are specifically intended to address climate problems play a special role in relation to climate change (Table 3.4). While up until recently there was a certain imbalance in these mechanisms in favour of measures to prevent climate change through reductions in greenhouse gas emissions, following the entry into force of the Paris Agreement practically equal weight has been given to the prevention of climate change and to adaptation. The Green Climate Fund and GEF mechanisms will directly provide resources for adaptation within the framework of the Paris Agreement, and assuming that the international community adopts the relevant decisions, they could be joined by the Kyoto Protocol Adaptation Fund as well.

Ukraine and Moldova have long had access to GEF resources, and cooperation with the fund has been arranged entirely in accordance with the regulations governing its activities: operational and policy focal points have been designated in the countries, and planning cycles have been developed for large-scale and medium-sized projects and small grants, and also for a programme-based approach in various thematic areas. The range of potential partners who may apply for funding is extremely broad and includes government agencies, scientific and nongovernmental organizations, and private companies. The allocation of GEF funding is complicated by the fact that in ad-

dition to climate change, the fund also deals with a wide range of other issues, including efforts to combat the decline in biodiversity, pollution of international waters, land degradation and desertification, and persistent organic pollutants, as well as efforts to promote green growth. This does, however, create opportunities to partially address adaptation tasks through actions in the relevant related areas.

Little practical experience has been gained at this point with the Green Climate Fund, although over the medium term it should already begin accumulating significant resources (the target set by the Paris Conference is US\$100 billion per year before 2020) and it will become a powerful potential source for adaptation financing. The fund recognizes national, regional, international and private organizations as accredited entities and each country may submit climate change financing proposals to the fund's board through an authorized government agency, as part of government strategies and plans. The governing documents of the Green Climate Fund specify that developing countries are able to access its resources. Moldova has access to these funds in accordance with the definition of the UNFCCC. Ukraine is included in Annex I to the UNFCCC, which identifies a list of developed and other countries (among other things, those that are undergoing the process of transition to a market economy), but it is not on the list of devel-

oped countries in Annex II. Thus, Ukraine's ability to obtain financing from the fund is not fully defined and will depend on decisions by its board of directors.

Ukraine's lack of access to the Kyoto Protocol Adaptation Fund, which can be used for the financing of concrete adaptation projects and programmes, and to the Special Climate Change Fund under the management of the GEF, limits the ability to make use of resources from these funds for adaptation efforts in the Dniester basin. As a developing country, Moldova does have access to these resources. Among the specific features of working with the Kyoto Protocol Adaptation Fund is direct access to resources (a country may propose its own institutions for accreditation and these institutions will bear responsibility for the approval of projects and programmes and will become the direct recipients of funding) and the existence of additional sources for replenishment of the fund (in addition to voluntary contributions from developed countries, allocations equal to 2 per cent of the value of certified emission reductions under the Kyoto Protocol Clean Development Mechanism are also applied to the fund).

Among the sources of financing for individual actions in the Dniester basin, one should also consider the capacities of organizations within the UN system, including the UNDP, the United

Nations Environment Programme (UNEP), the United Nations Industrial Development Organization (UNIDO) and the Food and Agriculture Organization of the United Nations (FAO). The Paris Conference called on UN institutions and international and regional financial organizations to provide information to the Parties to the Convention through its Secretariat about how measures to combat climate change and build resilience to climate change are included in the relevant country and regional development assistance programmes.

With the entry into force of the Paris Agreement, international financial organizations and groups, including the World Bank, the European Bank for Reconstruction and Development, the European Investment Bank, the German Credit Reconstruction Bank (KfW) and the Nordic Environment Finance Corporation (NEFCO), which are engaged in projects in the area of energy conservation and renewable energy, will begin to work more actively to extend their credit and investment programmes to cover the climate change adaptation sphere as well. At the same time, the use of their grants and credit resources in international basins could be complicated by the difficulty of managing transboundary projects that require a high degree of coordination among countries.

Economic instability is another problem for investors. A solution to this could be the de-

velopment of public-private partnership mechanisms in the climate change arena, which would back up government measures with private sector initiatives. For example, the growing impacts of climate change, and in particular extreme hydrometeorological events, are already accelerating the deterioration of fixed assets (building, structures, equipment) of electric power companies, which is forcing them to revise their development strategies and seek ways to adapt to the changing climatic conditions. Public-private partnerships will also encourage greater socioeconomic (including climate-related) responsibility in the business sector as a whole.

The Paris Agreement also provided an impetus for the creation of a global “green bond” trading system. The assumption is that this funding mechanism will make it possible to raise funds for the targeted financing of measures aimed at reducing greenhouse gas emissions, boosting energy efficiency, making rational use of water resources, providing clean drinking water and improving waste disposal, among other things. The expectation is that as a result of a number of targeted solutions (for example, certificates and permits for greenhouse gas emissions, a reporting system for nonfinancial risks) this mechanism could significantly reduce the cost of attracting funding, including funding for climate change adaptation.

**Table 3.4. Existing and prospective mechanisms for financing adaptation through international climate funds**

Sources of financing and their priorities	Financial security	Funding recipients	Direct access for implementing organizations	Cooperation experience, authorized bodies or representatives		Likelihood of obtaining funds to support adaptation		
				MD	UKR	MD	UKR	REGION
<b>Green Climate Fund</b> Adaptation Emissions reduction Deforestation and forest degradation	●	Developing countries	✓	- <sup>1</sup>	- <sup>1</sup>	●	● <sup>2</sup>	●
<b>Global Environment Facility</b> Climate change Biodiversity International waters Land degradation Chemical compounds and waste	●	Developing and other countries	-	✓	✓	●	●	●
<b>Special Climate Change Fund (managed by GEF)</b> Adaptation	●	Developing countries	-	✓	-	●	-	●
<b>Kyoto Protocol Adaptation Fund</b> Adaptation	●	Developing countries	✓	✓	-	●	-	●
<b>Climate investment funds</b> Clean technologies Renewable energy Energy efficiency Climate resilience Forest restoration and protection	? <sup>3</sup>	Developing and other countries	-	✓ <sup>4</sup>	✓ <sup>5</sup>	●	●	?

✓ yes    - no    ● high    ● average    ● low    ? unknown

<sup>1</sup> At the initial organizational stage

<sup>2</sup> Ukraine may gain access to Green Climate Fund resources if a relevant decision is made by its board of directors

<sup>3</sup> Over the medium term

<sup>4</sup> Projects to increase energy efficiency funded by the Eastern Europe Energy Efficiency and Environment Partnership (E5P)

<sup>5</sup> Projects to increase energy efficiency and promote renewable energy funded by the International Finance Corporation, the Clean Technology Fund (CTF) under the management of the World Bank, and the E5P

## **Actions to implement the Strategic Framework and adaptation measures**

- Design of projects and programmes for targeted international financing of concrete adaptation measures in the Dniester basin (organizations and agencies with an interest in the implementation of adaptation measures in the Dniester basin)
- Assistance in seeking out targeted (including “new climate”) financing for adaptation in the Dniester basin (agencies responsible for government climate policy and connections with international climate processes and organizations)
- Consideration of adaptation needs in the Dniester basin in the planning and implementation of international projects related to climate change and other issues (organizations participating in existing international projects; agencies responsible for the coordination of international assistance)
- Launching of public-private partnerships in the climate change arena, including arrangements for the financing of adaptation in the Dniester basin (agencies responsible for government financial and climate change policies, international investors)

### 3.6 Informational and promotional support

Support from scientific organizations and civil society in Moldova and Ukraine is essential for the effective performance of virtually all of the mechanisms discussed above. Current perceptions of global trends in climate change are changing rapidly, and the ongoing analysis of scientific understanding around the world and the concrete manifestations of global climate change in Moldova, Ukraine and the Dniester basin is essential to providing a sound basis for adaptation measures and making timely adjustments to them. The proposed adaptation measures in the basin already include the development and updating of the relevant information base, while continuous cooperation between government agencies and the scientific community and regular participation by the latter in the planning activities discussed in this chapter are vital to the success of the process.

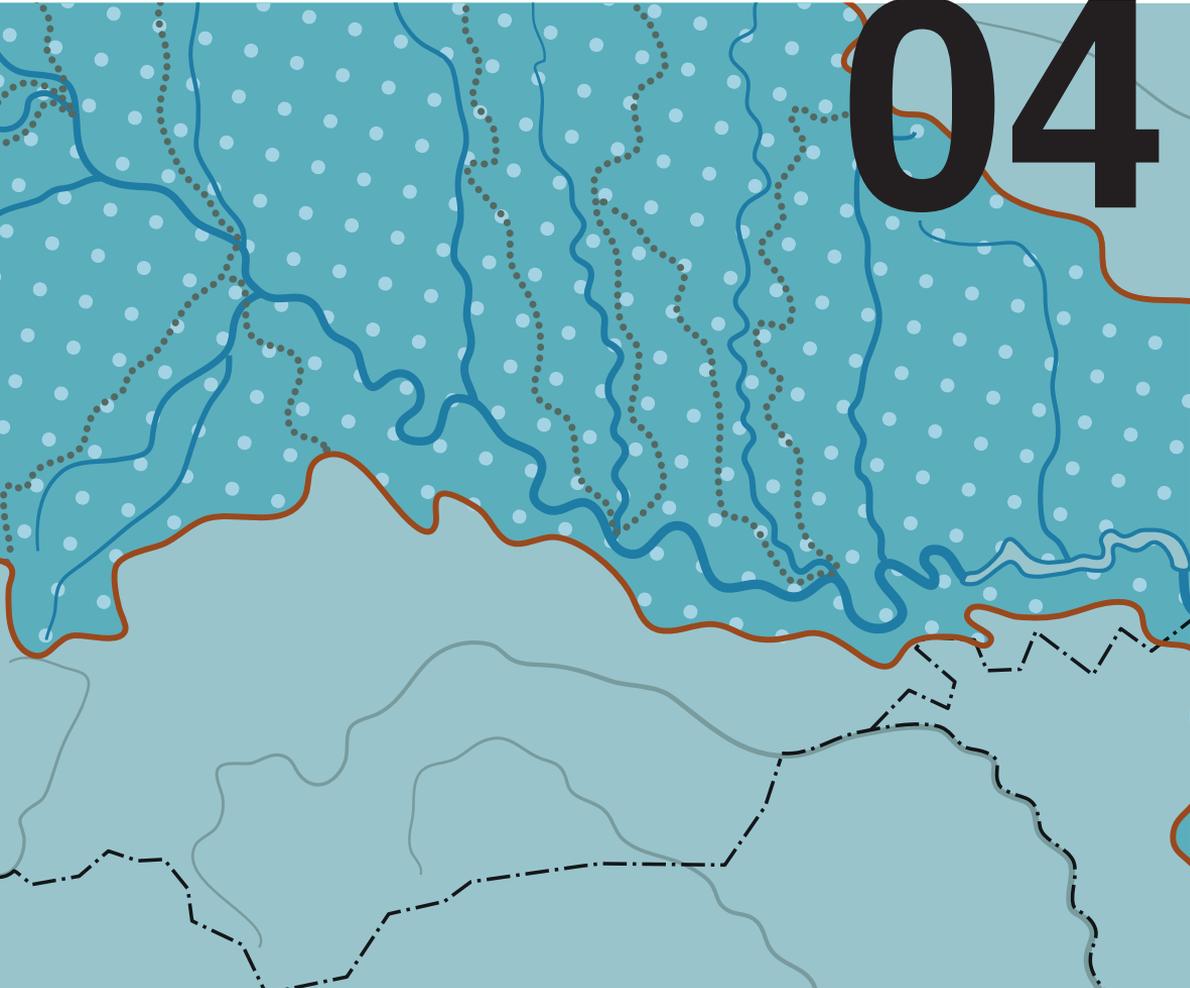
Participation by civil society is also necessary for the development and implementation of adaptation measures. Only nongovernmental organizations have sufficient energy and creative potential to keep all of the stakeholders in

the process informed of climate change challenges in the Dniester basin on a regular basis, at their own initiative and in an accessible form, and to encourage them to take concrete action. As the experience in the Dniester region also shows, civil society organizations are capable simultaneously of both participating effectively in the implementation of concrete adaptation measures - especially at the local level - and generally playing an intermediary role between national and local government authorities and the public.

Owing to a shortage of internal funding, in order for scientific and nongovernmental organizations to participate fully in addressing climate change challenges in the Dniester basin, they will require constant attention and support on the part of government, commercial and charitable organizations of Moldova, Ukraine and the international community. The development and implementation of a long-term programme offering small grants aimed at supporting climate change adaptation processes in the Dniester basin will also contribute to further activation and strengthening of the role of nongovernmental organizations.

#### Actions to implement the Strategic Framework and adaptation measures

- Ongoing analysis of scientific understanding around the world regarding climate change and its manifestations in the Dniester basin (scientific organizations in Moldova and Ukraine)
- Promotion of public awareness and lobbying with regard to adaptation needs in the Dniester basin, participation in actions at the local level (civil society organizations)
- Support for participation by scientific and public organizations in addressing climate change adaptation challenges in the Dniester basin (government, commercial, charitable, international organizations)



# 04

## **04. SUMMARY OF MECHANISMS FOR THE IMPLEMENTATION OF ADAPTATION MEASURES**

Table 4.1. provides a summary of the mechanisms discussed above, spelling out the concrete tasks and actions of various stakeholders aimed at the implementation of measures outlined in the Strategic Framework for Adaptation to Climate Change in the Dniester River Basin and listed in detail in Annex I, together with the corresponding “parallel processes” in Annex II.

Table 4.1. Summary of mechanisms for implementation of the Strategic Framework and adaptation measures

Key participants	Area of responsibility	Actions
<b>1. Integrated transboundary management of the Dniester basin</b>		
<b>Competent and interested agencies and organizations, basin commission</b>	Overall coordination of water and environmental activities in the basin	<b>Support for the entry into force of the basin treaty and full inclusion of climate dimensions in the integrated management plan for the Dniester basin</b>
<b>Competent government authorities responsible for implementation of the 1994 cooperation agreement on boundary waters</b>	Coordination of cooperation in the protection and use of boundary water bodies	<b>Inclusion of Dniester basin adaptation issues in meeting agendas and programmes of working groups, partial coordination of adaptation</b>
Other agencies responsible for transboundary cooperation	Coordination of bilateral cooperation in the relevant area	Inclusion of Dniester basin adaptation issues in bilateral cooperation programmes
<b>Organizations and agencies participating in the development and coordination of rules for the operation of reservoirs</b>	Development and coordination of rules for the operation of reservoirs	<b>Consideration of climate change trends and a possible change in flow regulation needs in operating rules</b>
Organizations and agencies that are members of the Interagency Commission on Establishment of Reservoir Operating Regimes	Effective coordination of the operating regime of hydraulic works on Dniester reservoirs	Increased attention to climate dimensions when determining the annual release regime
<b>2. European Union Association Agreements</b>		
<b>Environmental protection and water resources management bodies</b>	Planning and coordination of the implementation of the EU Water Framework Directive	<b>Inclusion of climate change issues and transboundary coordination of river basin management plans in plans for the implementation of EU water policy directives</b>
Agencies responsible for the implementation of other EU directives and the coordination thereof	Planning and coordination of the implementation of other directives	Consideration of climate change issues and proposed adaptation measures in the Dniester basin in plans for the implementation of other EU directives
Other interested organizations and agencies	Participation in the preparation of plans for the implementation of EU directives within the context of national processes and consultations	Lobbying for the consideration of climate dimensions and interests of the Dniester basin in the implementation of EU directives

Key participants	Area of responsibility	Actions
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### 3. National, sectoral and local development programmes

<b>Agencies responsible for national and sectoral plans and programmes</b>	Planning and coordination of the implementation of national and sectoral plans and programmes	<b>Inclusion of climate change adaptation measures in the Dniester basin in national and sectoral programmes</b>
<b>Government authorities responsible for local development plans and programmes</b>	Planning and coordination of the implementation of local development plans and programmes	<b>Inclusion of climate change adaptation measures in the Dniester basin in local plans and programmes</b>
Other interested organizations and agencies	Participation in national, sectoral and local plans and programmes	Lobbying for climate dimensions and interests of the Dniester basin in the design and implementation of plans and programmes

### 4. Climate change and adaptation policy

<b>Agencies responsible for government climate change adaptation plans and programmes</b>	Planning and coordination of the implementation of government adaptation plans and programmes	<b>Inclusion of climate change adaptation measures in the Dniester basin in climate change adaptation plans and programmes; initiation of the creation of new targeted financing mechanisms</b>
<b>Agencies responsible for government financial policy</b>	Coordination of the financing of government plans and programmes	<b>Initiation of new targeted financing mechanisms in the area of climate change</b>
<b>Local government authorities</b>	Planning and coordination of the implementation of local adaptation plans and programmes	<b>Inclusion of measures in the Dniester basin in local climate change adaptation plans and programmes</b>
<b>Other interested organizations and agencies</b>	Participation in national, sectoral and local plans and programmes	<b>Lobbying for the interests of the Dniester basin in national, sectoral and local plans and programmes and adaptation financing mechanisms</b>

Key participants	Area of responsibility	Actions
<b>5. International cooperation and technical assistance</b>		
<b>Organizations and agencies with an interest in the implementation of adaptation mechanisms in the Dniester basin</b>	Based on the scope of their authority	<b>Design of projects and programmes for targeted international financing of concrete adaptation measures</b>
<b>Agencies responsible for climate policy in Moldova and Ukraine</b>	Design and coordination of government climate policy, cooperation with the international community	<b>Assistance in seeking out targeted (including “new climate”) financing for adaptation in the Dniester basin</b>
<b>Organizations that are stakeholders in international projects; agencies responsible for the coordination of technical assistance</b>	Planning, implementation, financing of international projects	<b>Consideration of adaptation needs in the Dniester basin in projects related to climate change and other issues</b>
Agencies responsible for financial and climate policy, international investors	Strategic international cooperation between government and business in the area of climate change	Launching of public-private partnerships in the climate change arena, including arrangements for adaptation in the Dniester basin ☺
<b>6. Informational and promotional support</b>		
<b>Scientific organizations in Moldova and Ukraine</b>	Scientific research, scientific rationale for practical actions (including adaptation measures)	<b>Analysis of scientific understanding of climate change and its manifestations in the Dniester basin</b>
<b>Civil society organizations</b>	Public awareness campaigns, actions and mobilization of support at the local level	<b>Promotion of public awareness and lobbying with regard to adaptation needs in the Dniester basin, actions at the local level</b>
<b>Government, commercial, charitable, international organizations</b>	Financing for non-profit activities	<b>Support for participation by scientific and public organizations in addressing adaptation challenges in the Dniester basin</b>

Priority actions are identified in **bold**. The section numbers in the table correspond to the relevant section numbers in Chapter 3.

Successful implementation of these actions over the medium term will require a new critical analysis and possibly a revision of the package of adaptation measures, taking into consideration new data, experience and results. As indi-

cated above, the optimal organizational basis for this process is cooperation among the competent agencies, stakeholders, organizations and parties within the context of integrated management of the Dniester basin.

# ANNEX I

## FEATURES OF RECOMMENDED CLIMATE CHANGE ADAPTATION MEASURES IN THE DNIESTER BASIN

The proposed package of climate change adaptation measures in the Dniester basin was prepared through the joint efforts of specialists from Moldova, Ukraine and international organizations in 2014-2015. The proposed measures and their features were updated and revised taking into consideration consultations that were held as part of regular meetings of the bilateral Moldovan-Ukrainian Working Group on Flood Management and Climate Change Adaptation in the Dniester Basin and detailed discussions at meetings in Chisinau in Octo-

ber 2015 and in Kyiv in April 2016, as well as follow-up consultations during 2016 in Moldova and Ukraine.

The design of the measures and estimates of their cost were performed for three time horizons: less than five years, between five and ten years, and more than ten years. Current expenditures were not included in the cost estimates.

The “parallel processes” mentioned in the table are discussed in detail in Annex II, and their overall contribution to the financing of the implementation of concrete measures was estimated by experts using the available documents and financial information. The final table in Annex II provides a summary of information on “parallel financing” of adaptation measures in the basin.

### 1 = recommended implementation period

(short – 3-5 years; med – 5-10 years; long – more than 10 years)

### 2 = estimated cost of adaptation measures (€1000)

### 3 = Parallel processes (see Annex II) with an estimate of parallel financing for implementation of

the proposed measures ● 0–10% ● 10–25% ● 25–50%

**Table I.I. Features of recommended climate change adaptation measures in the Dniester basin**

	1	2	3
<b>Improved monitoring and forecasting of flow and information sharing</b>		<b>13322</b>	●
Creation of a telecommunications system for the sharing of hydrological data from automated observations	short	10	M-int U-wat U-em R-eu R-int
Creation and maintenance of an electronic platform for public access to hydrometeorological information	short	12	
Creation of and support for an interactive water balance calculation and forecasting system	short	20	
Automation of three priority hydrological stations in Ukraine	short	45	
Purchase and installation of instruments for the measurement of river water flow to depths of up to 50 metres in Moldova	short	45	
Improvement of flow forecasting methodology for the upper reaches of the Dniester	short	50	
Feasibility study of automation of the hydrometeorological observation network in the basin	short	50	
Improvement of the recording of utilization of water resources based on user reporting data	med	20	
Creation of and entry of data in an electronic water inventory system for the Dniester basin	med	30	
Improvement of short-term flood forecasting using weather radar	med	40	
Performance (updating) of surface and groundwater resource assessment in the Dniester basin	med	1500	
Purchase and installation of meteorological locators	med	10000	
Purchase and servicing of other equipment for development of the observation network	long	1500	
<b>Analysis and mapping of flood risk</b>		<b>1600</b>	●
Analysis and mapping of probable flood damage	short	200	M-wat M-eu U-wat U-eu U-plan U-em R-int
Analysis and mapping of zones vulnerable to flooding	short	600	
Performance of field work to update river channel profiles and hydromorphology	med	700	
Periodic updating of flood-risk mapping technology	long	100	

	1	2	3
<b>Inventory of flood protection infrastructure</b>		<b>4450</b>	●
Inventory of flood-control levees in Moldova	short	100	M-wat M-eu M-env U-wat U-plan
Inventory of the collector-drainage network and drainage pumping stations	short	150	
Study of the condition of water-regulation and water-retention facilities (dams and floodgates)	short	1000	
Inventory and creation of a GIS for river flood-control structures	short	2000	
Inventory of the Dubasari Hydroelectric Plant dam	med	500	
Assessment of the condition of shoreline reinforcement structures at reservoirs	med	700	
<b>Updating of flood protection plans</b>		<b>11100</b>	●
Pilot project to remove some homes from the flood zone in the village of Crocmaz, Stefan Voda district, Moldova	short	100	M-eu M-env U-wat U-em R-int
Analysis of built-up areas in flood zones and determination of the feasibility of removing structures from zones subject to flooding with varying frequency	short	400	
Preparation of flood protection plans for small and medium-sized tributaries	short	400	
Moving (parts of) population centres from zones potentially subject to catastrophic flooding and high-risk zones	short	10000	
Analysis of the functioning of flood protection systems in the basin and adjustments to future plans and systems, taking climate change into account	med	200	
<b>Restoration and optimization of the system of flood protection structures and culverts</b>		<b>96450</b>	●
Drafting of project documentation for restoration of priority sections of levees in the villages of Copanca, Causeni district; Crocmaz and Olanesti in Stefan Voda district; Onitcani and Corjova, and the city of Criuleni, Criuleni district, Moldova	short	250	M-wat M-eu M-env U-wat
Construction and reconstruction of storage capacities and polders with the aim of reducing maximum flood costs in Ukraine	short	4000	
Measures to provide flood protection for water intake facilities	short	4000	
Design and reconstruction of a levee with floodgates along the Odesa – Reni highway, on the Mayaki - Palanca section	short	1000	
Construction and reconstruction of levees, shoreline reinforcement, regulation of river channels with the aim of providing for the unhindered flow of floodwaters	short	50000	
Setting of priorities and preparation of a feasibility study for the reconstruction of highway and railroad bridges	med	200	
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Performance of measures to reduce surface runoff from the watershed (erosion control measures, protective embankments, afforestation, planting of grasses along the shoreline)	med	12000	
Performance of measures to prevent landslides and mudslides	long	10000	
Reconstruction of highway and railroad bridges to reduce resistance to the passage of water under them	long	15000	
<b>Updating and implementation of emergency response plans</b>		<b>9280</b>	●
Improvement of the regulatory and legal framework for the early warning system	short	10	M-int U-plan U-em R-eu R-int
Development and introduction of uniform rules for response in the event of emergencies of a transboundary nature	short	10	
Establishment of a standard risk assessment methodology for manmade and natural disasters in the Dniester basin	short	15	
Creation and introduction of national disaster risk reduction platforms	short	20	
Updating, preparation (if necessary) and implementation of action plans in the event of extreme flooding	short	50	
Training of residents in flood-prone areas, development of materials and handbooks for them, work with local population	short	50	
Updating of the functions and additional staffing of agencies involved in flood-related emergency prevention and response, including modernization of existing rescue equipment and purchase of new equipment	short	9000	
Design of measures to switch to groundwater supplies in the event of a critical drop in water levels, an accidental release of pollutants or other emergencies in the Dniester basin	med	50	
Compilation of an atlas of natural, manmade and social hazards and emergency risks in the Dniester basin	med	75	
<b>Providing the public and local authorities with timely information about the danger of flooding</b>		<b>1512</b>	●
Publication of maps of flood-risk zones on the websites of the relevant agencies	short	2	M-eu M-int U-em
Organization of internet access to current data on precipitation and flood risks	short	5	
Providing population centres with cartographic information on probable inundation zones	med	5	
Creation or reconstruction of (automated) warning systems to notify the public of flood-related emergencies	med	1500	

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<b>Introduction of a climate risk insurance system</b>		80	●
Study of the possibility of introducing mandatory insurance for housing, agricultural lands and other infrastructure facilities in flood-prone zones	short	50	U-em R-eu
Preparation of draft laws on mandatory insurance in flood-prone zones	short	30	
<b>Updating and observance of rules for the operation of the Dniester's system of reservoirs</b>		430	●
Changes to rules for the operation of the Dubasari reservoir	short	100	M-env U-plan R-int R-tech
Completion and coordination of rules for the operation of Dniester reservoirs, accompanied by the establishment of current standards for environmentally based releases	short	130	
Design and introduction of a management model for Dniester reservoirs	short	200	
<b>Reduction in water consumption and losses and modernization of irrigation systems</b>		2225	●
Development of a regulatory framework for tax incentives for the installation of drip irrigation	short	5	M-wat M-eu M-tech M-env U-agr
Pilot projects for the reconstruction of main water-supply canals and the Lower Dniester irrigation system in Ukraine's Odesa Oblast	short	100	
Pilot projects for the restoration of irrigations systems in the villages of Olanesti in Stefan Voda district, Gura Bicului in Anenii Noi district, and Holercani in Dubasari district, Moldova	short	270	
Introduction of water-saving irrigation technologies and drip irrigation (100 hectares) and subsurface irrigation (70 hectares) pilot projects in Moldova	short	550	
Purchase of economical low-pressure irrigation equipment	med	100	
Replacement of hydromechanical and electrical equipment in irrigation systems in Odesa Oblast and other areas of Ukraine	med	150	
Pilot projects for the construction of drip irrigation systems in the Dniester River basin in Ukraine's Odesa Oblast	med	1050	
<b>Improved monitoring of surface and groundwater quality</b>		1180	●
Compilation of maps indicating the quality of surface and groundwater	short	20	U-wat U-eu U-reg U-env R-eu R-int
Introduction of water quality classification in Ukraine in accordance with the EU Water Framework Directive	short	30	
Reorganization of the water quality monitoring network based on new (designated) sections of water bodies in accordance with the EU Water Framework Directive	short	250	
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Supplying laboratories with modern equipment (including mobile instruments) for water quality analysis	short	600	
Improvement of joint transboundary monitoring of surface and groundwater quality	med	60	
Equipping individual stations and wells with automatic sensors for the measurement of water quality indicators	med	220	
<b>Improvement of drainage and wastewater treatment systems</b>		<b>22700</b>	●
Improvement of the legal framework and standards concerning water supply, drainage and wastewater treatment	short	200	M-tech M-env
Reconstruction of sewage treatment facilities in the municipalities of Teplodar and Mayaki in Odesa Oblast	short	500	
Preparation of a feasibility study, design and construction of treatment facilities in the city of Soroca, Moldova	short	1000	
Utilization of alternative solutions for wastewater treatment (in particular those involving the use of artificial wetlands)	short	1000	
Restoration, expansion and modernization of existing water supply and sewage networks in the Dniester basin (including decentralized systems)	short	20000	
<b>Upgrading and diversification of water treatment and supply systems</b>		<b>1950</b>	●
Pilot projects using modern water treatment systems, including modular systems	short	700	M-wat M-eu M-tech M-env U-wat
Silt removal from water intake facilities in the cities of Khotyn and Kamianets-Podilskyi and the village of Rukshyn in Khmelnytsky Oblast, Ukraine	short	700	
Preparation of a feasibility study for a water supply and sewer system project in the village of Dubasarii Vechi in Criuleni district, Moldova, using components of the existing irrigation system	med	30	
Research on alternative water supply sources for population centres in the Dniester basin	med	500	
Study of the possibility of increasing operational groundwater reserves through artificial recharging	long	20	
<b>Protection and regulation of the use of water protection zones</b>		<b>1275</b>	●
Creation of a spatial database of water protection zones	short	50	M-wat M-eu U-agr U-wat
Identification and creation of a spatial database of potential surface and groundwater pollution sources	short	100	
Project to set up a water protection zone between the Dubasari Hydroelectric Plant and Olanesti	med	125	
Projects to identify and develop water protection zones on the Dniester, Raut, Bic and Botna rivers	med	1000	

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<b>Optimization of the regulation of flow at the local level</b>		<b>2200</b>	●
Installation of small flood control structures using the resources of local government authorities and the public in Ukraine	short	1000	U-em
Analysis and recommendations regarding the optimal degree of local flow regulation in the Dniester basin	short	1200	
<b>Protection and restoration of forests</b>		<b>21250</b>	●
Assessment of the potential for and limitations on energy plantations along the Dniester and its tributaries	short	50	M-bio M-clim M-int M-env U-bio U-reg R-eu
Assessment of the distribution of zones with insufficient water-protection plantings and identification of priority sites for tree-planting projects	short	60	
Development of legislative and institutional measures at the national and regional levels to encourage an increase in forest cover in the Dniester basin	short	70	
Legal definition and introduction of local authorities' fiscal and administrative responsibility for the condition of shoreline shelterbelts. Increased responsibility of forest plantation owners at the local level	short	70	
Special pilot measures for forest protection and restoration	short	200	
Creation of gene banks for forest tree species	short	800	
Design and implementation of a programme for the reconstruction and replacement of degraded shelterbelts along the Dniester, its main tributaries and reservoirs	med	8000	
Design and implementation of a priority tree-planting programme in zones with insufficient water-protection plantings	med	12000	
<b>Improved monitoring and assessment of ecosystems and biological resources</b>		<b>5035</b>	●
Territorial analysis of threats to forests, floodplain ecosystems and floodplain meadows	short	100	M-био M-клим M-межд M-эко У-био У-рег У-эко
Assessment of the basin's vulnerability in terms of surface runoff distribution and retention, planning of the relevant protection measures	short	150	
Determination of the parameters for ecosystem monitoring (including forest ecosystems) from the standpoint of tracking the impact of climate change in decision-making	short	180	
Inclusion of observations of the migration and aggregations of wetland birds in the monitoring system, within the context of the Bonn Convention and the EU Birds Directive	short	180	
Assessment of the condition, mapping and creation of a GIS of shoreline forest plantings along the Dniester, primary and secondary tributaries, reservoirs, and sources of primary, secondary and tertiary tributaries	short	180	
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Identification of ecosystem resilience and vulnerability zones and determination of the relevant management measures; inventory and mapping of promising ecosystems for restoration	short	200	
Inclusion of ecosystem observation parameters in the monitoring system (including forest and wetland ecosystems) within the context of climate change	short	350	
Creation of systems for the early detection of fires in forest and floodplain ecosystems and for issuing fire warnings	short	2400	
Assessment of prospects for the development of hydrological and edaphic processes in ecosystems and long-term planning with respect to wetland zones	med	145	
Creation of combined databases for transboundary environmental protection areas	med	300	
Inclusion of observations of the status of territories in the monitoring system within the context of the EU Habitats Directive	med	850	
<b>Analysis of ecosystem services at the basin level</b>		<b>970</b>	●
Analysis and financial assessment of wetland and other major ecosystem services	short	170	M-bio U-bio U-env R-eu
Analysis and financial assessment of forest ecosystem services	short	320	
Financial assessment of ecosystem services in the preservation of biodiversity	short	350	
Analysis and financial assessment of steppe and meadow ecosystem services	med	130	
<b>Regulation of activities within floodplains and wetland areas</b>		<b>10820</b>	●
Development of mechanisms for sectoral and intersectoral responsibility for the management of wetlands under shared control	short	60	M-bio M-clim M-env U-bio U-reg U-env
Technological adaptation of forestry in floodplain areas under climate change	short	60	
Implementation of drought-prevention measures in Dniester floodplains in Belyayev district, Odesa Oblast, Ukraine	short	60	
Long-range planning for problem sections of the Dniester basin (shoreline and shallow parts of the Dniester and Dubasari reservoirs, degraded sections of shoreline communities)	med	40	
Change in the designated use of eroded, inundated agricultural lands in floodplains, and their conversion from arable land into pastureland, grassland and forest land	med	300	
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Implementation of demonstration projects for the regulation and integrated use of reeds, sedges and other vegetation in the Lower Dniester and in Dniester wetlands	med	1000	
Implementation of demonstration projects for the restoration of natural or nearly natural grazing in floodplains using wild (roe deer, boars, bison) and domestic animals (horses, cattle, Carpathian buffalo, geese)	med	1500	
Regulation of the use of pasturelands: official permitting documentation, legislative provisions, drafting of model pasture management plans	med	1800	
Withdrawal of lands from agricultural use when they have lost their profitability or are being used illegally in water protection zones	med	3000	
Implementation of demonstration projects for the reconstruction of hydraulic engineering structures of unregulated agricultural polders, turning them into polders with regulated flooding	med	3000	
<b>Expansion and strengthening of the network of specially protected natural areas and ecological corridors</b>		<b>12180</b>	●
Inclusion of ecological network components in land-use planning and urban development documentation	short	130	M-bio M-clim M-int M-tech M-env U-eu U-reg R-eu
Completion of the planning of an ecological corridor system in the Dniester basin on a 1:100000 scale	short	300	
Drafting of land-use planning projects and establishment of the boundaries of specially protected natural areas	short	600	
Development of projects for the creation and modification of specially protected natural areas in the Dniester basin, including the development of an ecological network, taking into account climate change, the Natura 2000 programme, and obligations and practices in connection with association with the EU and the Bern Convention	short	1200	
Installation of irrigation systems at tree nurseries, introduction of technologies for growing seedlings with a closed root system	short	3330	
Creation of transboundary biosphere reserves in the middle and upper reaches of the Dniester based on existing and new national parks and Ramsar sites	short	3600	
Development of the status and legal definition of protection of ecological network elements	med	20	
Creation of shelterbelts to control surface runoff along ecological corridors	med	3000	

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<b>Combating poaching and invasive species</b>		<b>6144</b>	●
Legislation establishing wildlife refuges in areas with a high concentration of biodiversity and relative ecosystem resilience to climate change	short	2	M-bio U-reg R-eu
Multilateral moratorium on commercial fishing under the treaty between Ukraine and Moldova on utilization of the Dniester's resources (with the exception of the Dniester estuary), or establishment of a quota system based on stocking performed by fishermen	short	2	
Stricter penalties for poaching, introduction of the relevant amendments to legislation	short	40	
Fiscal-legal regulation of efforts to combat aggressive invasive species in forestry and fishing	short	40	
Public education programmes aimed at the general population, land-users, forestry workers, hunters and fisherman to aid in controlling the number of invasive species	short	60	
Development and implementation of methods, plans and programmes to combat aggressive invasive species such as box elder ( <i>Acer negundo</i> ), silverberry ( <i>Elaeagnus commutata</i> ), false indigo bush ( <i>Amorpha fruticosa</i> ), Sosnowsky's hogweed ( <i>Heracleum sosnowskyi</i> ) and golden jackal ( <i>Canis aureus</i> ), among others, in protected natural areas, lands operated by forestry enterprises (as part of environmental harvesting) and hunting grounds	med	6000	
<b>Protection and restoration of shoreline, wetland and aquatic ecosystems</b>		<b>7919</b>	●
Legislation establishing protection for sections of lakes, ponds, reservoirs and adjacent areas with special importance for the treatment and preservation of natural waters	short	4	M-bio M-tech M-env U-reg R-int
Introduction of measures for the conservation, restoration and increase in the numbers of targeted groups of flora, fauna and plant communities protected under international and national laws (old-growth forests, fish, birds, mammals, including bats, etc.)	short	600	
Development of recommendations and implementation of demonstration projects for the restoration of sites and their economically effective use (plantings, regulated spawning grounds, pasturelands and grasslands, hunting grounds, tourism and recreation)	short	1500	
Environmental restoration of the old channel of the Dniester (restoration of its connection to the Dniester, clearing of the channel)	short	2000	
Restoration of other problem ecosystems and preservation of ecosystems of especially valuable sites	short	3000	
Assessment of the prospects for restoration of the populations of anadromous fish species (herring, sturgeon) and construction of fish bypass channels on the Dniester and Dubasari reservoirs	med	100	
Restoration of the exchange of water between the Dniester and estuary wetlands	med	325	
Assessment of the outlook for and environmental restoration of small water bodies in the Dniester valley	med	390	

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<b>Analysis and forecasting of climate change and its impacts in the basin</b>		<b>275</b>	●
Analysis of the impact of climate change in the basin on the vulnerability of water resources	short	30	M-wat
Analysis of the impact of climate change in the basin on the vulnerability of agriculture	short	70	M-eu M-clim
Regular analysis of climate change in the basin over the medium and long term	med	50	M-int U-clim
Research on the basin's vulnerability to climate change and risk assessment for sectors of the economy and natural ecosystems over the medium and long term	med	125	U-plan R-int
<b>Inclusion of adaptation needs in IWRM plans and development plans for sectors and territories</b>		<b>900</b>	●
Consideration of climate dimensions in the management plan for the Dniester basin district in Moldova	short	50	M-clim M-int U-agr U-reg R-eu R-int
Consideration of the Dniester basin in national climate change adaptation plans	med	100	
Consideration of climate dimensions in the management plan for the Ukrainian part of the Dniester basin	med	100	
Integration of climate change measures into development plans for population centres	med	150	
Drafting of water supply development plans taking climate change into account	med	150	
Drafting of irrigation development plans taking climate change into account	med	150	
Integration of climate dimensions into the joint Dniester basin management plan	long	200	
<b>Dissemination of information about climate change challenges in the basin</b>		<b>180</b>	●
Inclusion of information about climate change challenges in the Dniester basin in regular government reports on the status of the environment	short	30	U-plan M-int R-int
Organization of conferences, seminars and round tables for the purpose of sharing information and experience in addressing problems caused by climate change in the Dniester basin	short	50	
Preparation and publication of popular science materials about the impact of climate change on the status of the environment in the Dniester basin and ways to address the relevant problems	short	100	

## **ANNEX II**

### **OVERVIEW OF “PARALLEL PROCESSES”: PROGRAMMES, STRATEGIES, PLANS AND PROJECTS ADDRESSING RELATED TASKS**

#### **MOLDOVA**

##### **M-bio targeted programmes and strategies for the protection and use of biological and forest resources**

National Programme for the Creation of a National Ecological Network for 2011-2018 (approved by Republic of Moldova Government Resolution No. 593 of 1 August 2011)

National Strategy for the Preservation of Biological Diversity for 2015-2020 and the strategy implementation plan (approved by Republic of Moldova Government Resolution No. 274 of 18 May 2015)

National Strategy for the Long-Term Development of the Forestry Sector in the Republic of Moldova (approved by Republic of Moldova Government Resolution No. 350 of 12 July 2001)

National Strategy for the Development of Agriculture and Rural Areas for 2014-2020 (approved by Republic of Moldova Government Resolution No. 409 of 4 June 2014)

National Plan to Expand the Forest Cover for 2014-2018 (approved by Republic of Moldova Government Resolution No. 101 of 10 February 2014)

Plans for the management of wetlands under the Ramsar Convention:

- management plan for the Unguri-Holosnita Ramsar site (approved by Republic of Moldova Ministry of the Environment Order No. 93 of 1 December 2014)
- management plan for the Lower Dniester Ramsar site (approved by Republic of Moldova Ministry of the Environment Order No. 93 of 1 December 2014)

## **M-wat** **targeted programmes and strategies for the protection and use of water resources**

National Strategy for the Development of Agriculture and Rural Areas for 2014-2020 and the strategy implementation plan (approved by Republic of Moldova Government Resolution No. 409 of 4 June 2014)

Management Plan for the Moldovan Part of the Dniester River Basin District (draft)

Programme for the Development of Water Resources Management and Water Management Practices in Agriculture in the Republic of Moldova for 2011-2020 (approved by Republic of Moldova Government Resolution No. 751 of 5 October 2011)

Water Supply and Drainage Strategy for 2014-2018 and implementation plan for this period (approved by Republic of Moldova Government Resolution No. 199 of 20 March 2014)

## **M-eu** **European Union assistance projects**

Flood Protection in the Republic of Moldova, European Investment Bank. 2012-2016 technical assistance project (financed by the Eastern Partnership Technical Assistance Trust Fund, or EPTATF) and investment programme (in the preparation process)

## **M-clim** **targeted programmes in the area of climate change**

Climate Change Adaptation Strategy for the Republic of Moldova up to 2020 and action plan for its implementation (approved by Republic of Moldova Government Resolution No. 009 of 10 December 2014)

## **M-int** **international assistance projects**

Adaptation to Climate Change in Moldova, GEF and World Bank investment project (in the preparation process)

Our Rivers - the Challenge of Transboundary Waters, Global Environment Facility Small Grants Programme in Moldova and EcoCatalyst Foundation (USA), 2014-2015

Moldova Agriculture Competitiveness Project, Global Environment Facility/World Bank (including the Support for Rehabilitation of Forestry Shelterbelts component), 2012-2017

Building Agricultural Resilience to Climate Change, International Fund for Agricultural Development, 2014-2020

Supporting the Climate Change Adaptation Planning Process, Building Institutional and Technical Capacities for Iterative Development of National Adaptation Plans component, Aus-

trian Development Agency/UNDP, 2013-2017

Disaster and Climate Risk Reduction Project, Phase II, UNDP (Bureau for Crisis Prevention and Recovery, or BCPR), 2013-2016

Disaster and Climate Risk Management Project, World Bank, 2010-2016

Improved Meteorological and Climatological Services in Moldova, technical support grant from the Global Facility for Disaster Reduction and Recovery (GFDRR, in the preparation process)

## **M-tech** **foreign (bilateral) technical assistance projects**

Water and Sanitation Project in the Republic of Moldova (ApaSan), Swiss Agency for Development and Cooperation, with the participation of the Austrian Development Agency, 2015-2019

Rehabilitation of Centralized Irrigation Systems, Millennium Challenge Corporation (USA)

Sustainability Measures for Water-Related Ecosystems in the Lower Dniester Ramsar Site, Austrian Development Agency, 2014-2017

Inter-Municipal Water Management along the Dniester River, German Agency for International Cooperation (GIZ), 2016-2018

Strengthening the Institutional Framework in the Water and Sanitation Sector in Moldova, Austrian Development Agency and Swiss Agency for Development and Cooperation, 2016-2019

**M-env**  
**targeted environmental protection programmes and strategies**

Republic of Moldova National Environmental Fund financing programmes

Environmental Strategy for 2014-2023 and action plan for its implementation (approved by Republic of Moldova Government Resolution No. 301 of 24 April 2014)

**UKRAINE**

**U-agr**  
**targeted programmes and strategies for agricultural development**

Conceptual Framework of the State Targeted Programme for Development of the Agricultural Sector of the Economy up to 2020 (approved by Ukrainian Cabinet of Ministers Directive No. 1437-r of 30 December 2015)

**U-bio**  
**targeted programmes and strategies for the protection and use of biological and forest resources**

“Ukrainian Forests” State Targeted Programme for 2010-2015 (approved by Ukrainian Cabinet of Ministers Resolution No. 977 of 16 September 2009)

Conceptual Framework of the State Targeted Programme for Development of Forestry in Ukraine for 2016-2020 (draft)

Conceptual Framework for Preservation of Biodiversity in Ukraine (as amended by Ukrainian Cabinet of Ministers Resolution No. 1048 of 12 October 2011) and State Programme for Preservation of Biodiversity in Ukraine for 2007-2025 (draft)

**U-wat**  
**targeted programmes and strategies for the protection and use of water resources**

“Drinking Water in Ukraine” State Programme (approved by Law of Ukraine No. 2455-IV of 3 March 2005)

Targeted State Programme for Integrated Flood Protection in the Dniester, Prut and Seret River Basins (approved by Ukrainian Cabinet of Ministers Resolution No. 1151 of 27 December 2008)

Targeted State Programme for the Development of Water Resources Management and Environmental Restoration of the Dnieper River Basin up to 2021 (approved by Law of Ukraine No. 4836-VI of 24 May 2012), Integrated Flood Protection in the Dniester, Prut and Seret River Basins section

Integrated Programme for the Protection of Rural Population Centres and Agricultural Lands from the Harmful Effects of Water up to 2010 and a Projection up to 2020 (approved by Ukrainian Cabinet of Ministers Resolution No. 901 of 3 June 2006)

**U-eu**  
**plans for the implementation of European Union directives and assistance projects**

Plan for the implementation of European Parliament and Council Directive 2000/60/EC of 23 October 2000 establishing a framework for Community action in the field of water policy, as amended by Decision 2455/2001/EC and Directive 2009/31/EC

Plan for the implementation of European Parliament and Council Directive 2007/60/EC on the assessment and management of flood risks (with regard to measures with an implementation deadline before the end of 2017)

Plan for the implementation of Directive 2009/147/EC on the conservation of wild birds

Plan for the implementation of Directive 91/676/EEC concerning the protection of waters against pollution caused by nitrates from agricultural sources, as amended by Regulation (EC) 1882/2003

Plan for the implementation of Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora, as amended by Directives 97/62/EC and 2006/105/EC and Regulation (EC) 1882/2003

Plan for the implementation of EU Council Directive 91/271/EEC of 21 May 1991 concerning urban waste-water treatment

Plan for the implementation of EU Council Directive 98/83/EC of 3 November 1998 on the quality of water intended for human consumption

Support to Ukraine in approximation of the EU environmental acquis (APENA), 2015-2018

### **U-clim targeted programmes and strategies in the area of climate change**

Conceptual Framework for the Implementation of Government Policy in the Area of Climate Change up to 2030 (approved by Ukrainian Cabinet of Ministers Directive No. 932-r of 7 December 2016; assumes the drafting and adoption of the Climate Change Adaptation Strategy in 2017)

### **U-plan planning work by government enterprises and institutions**

According to the regulations for the operation of flood-protection structures, the State Water Resources Agency performs a survey of their condition on an annual basis and after heavy flooding. The Dniester Reservoirs Operating Service periodically performs inspections and assessments of the condition of bank reinforcement structures. When necessary, repairs or reconstruction of bank reinforcement structures on reservoirs are performed. Within the context of medium-range planning work in Ukraine, there are plans to study the condition of the catchment area of the Dniester basin, evaluate the reliability of the existing water control facilities and compile the documentation necessary for future design work.

The State Water Resources Agency is also coordinating planning work related to updating the rules for the operation of the Dniester reservoirs.

The Dniester-Prut Basin Water Resources Administration and oblast water resources administrations of Lviv, Ivano-Frankivsk, Ternopil, Khmelnytsky and Odesa oblasts observe International Dniester River Day every year.

Ukraine has a national emergency response plan in place, which was approved by Ukrainian Cabinet of Ministers Resolution No. 1567 of 16 November 2001.

Within the framework of the plan for scientific and scientific-technical activities of the Ukrainian Hydrometeorological Institute, the State Emergency Service and the National Academy of Sciences, there are provisions for scientific research work that could be useful, among other things, for the development of climate change adaptation measures in the Dniester basin (the identification of “climate-vulnerable” parts of Ukraine, quantitative assessment and forecasting of the condition of the climate system, calculation of the characteristics of maximum runoff from spring high-water levels, development of criteria and preliminary estimates of flood risk within the boundaries of river basins in accordance with EU regulatory documents).

### **U-reg regional targeted programmes and strategies**

State Regional Development Strategy up to 2020 (approved by Ukrainian Cabinet of Ministers Resolution No. 385 of 6 August 2014) and the 2015-2017 action plan for its implementation (approved by Ukrainian Cabinet of Ministers Resolution No. 821 of 7 October 2015)

Environmental monitoring programmes of Ukrainian oblasts:

- Vinnitsya Oblast for 2012-2016 (draft)
- Lviv Oblast for 2011-2015 and up to 2020 (approved by Oblast Council Decision No. 322 of 20 December 2011)

- Odesa Oblast for 2011-2017 (approved by an Oblast Council decision on 31 March 2006)
- Khmelnytsky Oblast for 2011-2016 (approved by a decision of the third session of the Oblast Council on 29 February 2016)

Environmental protection programmes of Ukrainian oblasts:

- Odesa Oblast Integrated Programme for Environmental Protection, Rational Use of Natural Resources and Environmental Safety for 2014-2019
- “Ecology” Integrated Programme for Environmental Protection in Chernivtsi Oblast for 2016-2018
- Ivano-Frankivsk Oblast Programme for the Protection of the Natural Environment up to 2020
- Ternopil Oblast Programme for the Protection of the Natural Environment for 2014-2020
- Ternopil Oblast Programme for the Development of Water Resources Management and Restoration of the Aquatic Natural Environment up to 2021
- Vinnitsya Oblast Regional Programme for Environmental Protection and Use of Natural Resources for 2013-2018
- Lviv Oblast Regional Programme for the Development of Conservation Activity for 2009-2020

Regional development strategies of Ukrainian oblasts:

- Ivano-Frankivsk Oblast Development Strategy up to 2020 (approved by Oblast Council Decision No. 1401-32/2014 of 17 October 2014)
- Lviv Oblast Development Strategy up to 2020 (draft)
- Khmelnytsky Oblast Regional Development Strategy for 2011-2020 (approved by Oblast Council Decision No. 24-4/2011 of 18 May 2011)
- Vinnitsya Oblast Balanced Regional Development Strategy up to 2020 (approved by Oblast Council Decision No. 893 of 24 June 2015)
- Odesa Oblast Economic and Social Development Strategy up to 2020 (approved by Oblast Council Decision No. 272-VI of 28 October 2011)

**U-em targeted programmes and strategies for emergencies**

State Targeted Programme to Protect the Population and Territories from Manmade and Natural Emergencies for 2013-2017 (approved by Law of Ukraine No. 4909-VI of 7 June 2012)

Conceptual Framework for the Management of Risks Associated with Manmade and Natural Emergencies (approved by Ukrainian Cabinet

of Ministers Directive No. 37-r of 22 January 2014) and action plan to implement the conceptual framework for 2015-2020 (approved by Ukrainian Cabinet of Ministers Directive No. 419-r of 25 March 2015)

**U-env targeted programmes and strategies in the area of environmental protection**

Package of measures to improve environmental monitoring and government regulation in the handling of waste in Ukraine (Decree No. 572/2013 of the President of Ukraine of 18 October 2013, on the Decision of the Ukrainian National Security and Defence Council of 25 April 2013)

Conceptual framework for combating land degradation and desertification (approved by Ukrainian Cabinet of Ministers Directive No. 1024-r of 22 October 2014) and National Action Plan to Combat Land Degradation and Desertification (approved by Ukrainian Cabinet of Ministers Directive No. 271-r of 30 March 2016)

Conceptual framework for reform of the state environmental monitoring system (draft)

Basic provisions (strategy) of Ukraine’s state environmental policy up to 2020 (approved by the Law of Ukraine of 21 December 2010; draft amendments to the 2016 version of the law provide for strengthening of the climate component of the strategy)

## REGIONAL PROCESSES

### R-eu

#### European Union assistance projects

European Union Water Initiative Plus for the Eastern Partnership (EU WI Plus), 2016-2019

Environmental Protection of International River Basins (EPIRB), 2012-2016

Support to Climate Change Mitigation and Adaptation in the Eastern Neighbourhood Countries and Russia (ClimaEast), 2013-2016

European Neighborhood and Partnership Instrument East Countries Forest Law Enforcement and Governance Program, Phase II (ENPI FLEG II), 2012-2016

Prevention and Protection against Floods in the Upper Siret and Prut River Basins through the Implementation of a Modern Monitoring System with Automatic Stations (EAST AVERT)

Programme on Prevention, Preparedness and Response to Manmade and Natural Disasters in the ENPI East Region (PPRD East), Phase II, 2015-2018

### R-int

#### international assistance projects

Climate Change and Security in Eastern Europe, Central Asia and the Southern Caucasus. Project under the international Environment and Security Initiative with the support of the European Commission and the Austrian Government, 2013-2017. Climate Change and Security in the Dniester River Basin component

Transboundary Cooperation and Integrated Water Resources Management in the Dniester River Basin. GEF, UNDP and OSCE, 2017-2020 (in the preparation process)

Climate Forum East. Project funded by the European Union, the Austrian Development Agency, the Austrian Red Cross and the Worldwide Fund for Nature, 2013-2017

### R-tech

#### foreign (bilateral) technical assistance projects

Development of an integrated model for the functioning of the Dniester reservoirs. Project of the Institute for Water Resources of the U.S. Army Corps of Engineers and the Alliance for Global Water Adaptation, 2013-2016



**Table II.I. Relationship between proposed adaptation measures in the Dniester basin and actions within the context of the “parallel processes” analysed**

Measures	Moldova							Ukraine							Regional				
	M-bio	M-wat	M-eu	M-clim	M-int	M-tech	M-env	U-agr	U-bio	U-wat	U-eu	U-clim	U-plan	U-reg	U-em	U-env	R-eu	R-int	R-tech
Improved monitoring and forecasting of flow and information sharing					●					●					●		●	●	
Analysis and mapping of flood risk		●	●							●		●			●			●	
Inventory of flood protection infrastructure		●	●				●			●			●						
Updating of flood protection plans			●				●			●					●			●	
Restoration and optimization of the system of flood protection structures and culverts		●	●				●			●									
Updating and implementation of emergency response plans					●							●			●		●	●	
Providing the public and local authorities with timely information about the danger of flooding			●		●										●				
Introduction of a climate risk insurance system													●		●		●		
Updating and observance of rules for the operation of the Dniester's system of reservoirs							●						●					●	●
Reduction in water consumption and losses and modernization of irrigation systems		●	●			●	●	●			●								
Improved monitoring of surface and groundwater quality										●		●		●		●	●	●	
Improvement of drainage and wastewater treatment systems						●	●												
Upgrading and diversification of water treatment and supply systems		●	●			●	●				●								
Protection and regulation of the use of water protection zones		●	●					●		●	●								
Optimization of the regulation of flow at the local level															●				
Protection and restoration of forests	●			●	●		●		●						●		●		
Improved monitoring and assessment of ecosystems and biological resources	●			●	●		●		●						●	●			
Analysis of ecosystem services at the basin level	●								●							●	●		
Regulation of activities within floodplains and wetlands	●			●			●		●					●		●			
Expansion and strengthening of the network of specially protected natural areas and ecological corridors	●			●	●	●	●							●			●		
Combating poaching and invasive species	●													●			●		
Protection and restoration of shoreline, wetland and aquatic ecosystems	●					●	●							●				●	
Analysis and forecasting of climate change and its impacts in the basin		●	●	●	●								●					●	
Inclusion of adaptation needs in IWRM plans and development plans for sectors and territories				●	●			●			●			●			●	●	
Dissemination of information about climate change challenges in the basin					●									●				●	



