



## Mainstreaming Climate Change Adaptation into Moldova's Policy and Planning

A simplified User's Guide

A publication of the ADA/UNDP project "Supporting Moldova's National  
Climate Change Adaptation Planning Process"

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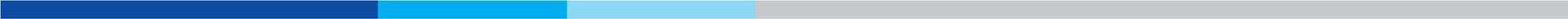
## A simplified User's Guide

As part of the Project

**Supporting Moldova's National Climate Change Adaptation Planning Process** supported by the Austrian Development Cooperation (ADC) with funding from the Austrian Federal Ministry of Agriculture, Forestry, Environment and Water Management and implemented by UNDP Moldova in partnership with the Ministry of Environment and its Climate Change Office.

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# 1. Introduction

Climate change is a potentially significant threat to global development, and naturally to Moldova as well. Impacts to society, economy and environment are complex, and require coordination across sectors and levels of governance. While many foreseen impacts will bring about negative effects, climate change can also generate opportunities, which can be harnessed with good planning.

1. Mainstreaming climate change into Moldova’s development process means integrating climate change considerations in decision-making processes, in an informed way. This includes identifying risks and opportunities from current climate conditions and trends as well as projections for future, long-term climate.

While climate mainstreaming is often applied to projects, programs or other specific activities in order to reduce risks and optimize preparedness for climate impacts, a process sometimes referred to as “climate proofing”, this Guide focuses on strategic development documents, such as **Plans, Strategies and Policies**

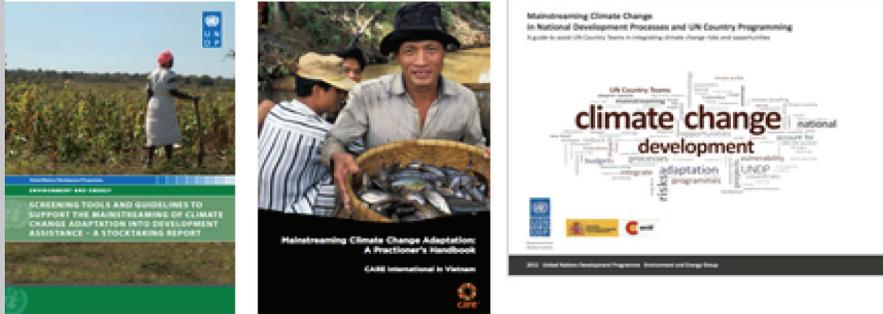
This Guide on Mainstreaming Climate Change in Moldova’s Development presents three main parts of the process:

- **Climate Risk Screening**
- **Integrating Climate Change into the Planning Process**
- **Prioritising options for adaptation or resilience**

The second part of the Guide provides an overview and recommendations on how to proceed with the integration of climate change considerations into national or sectorial strategy or policy documents, after the climate change risks have been duly screened and acknowledged. Climate risk screening is an important and integral part of the effort to determine current and future vulnerabilities to climate change, and a prerequisite to identify adaptation measures or pathways to reduce those vulnerabilities, increase resilience, and take advantage of any opportunities which may be identified.

There are various methodological tools used to screen for climate risks and opportunities in strategy planning processes (see Box 1). Many have been developed by or for development agencies and may be adapted specifically to national planning and policy documents.

More detailed Guides on Assessing Climate Risks and Opportunities



The image displays three book covers. The left cover is titled 'SCREENING TOOLS AND GUIDELINES TO SUPPORT THE MAINSTREAMING OF CLIMATE CHANGE ADAPTATION INTO DEVELOPMENT ASSISTANCE - A STOCKTAKING REPORT' and features a woman in a field. The middle cover is 'Mainstreaming Climate Change Adaptation: A Practitioner's Handbook' by CARE International in Vietnam, showing a man with a basket of fish. The right cover is 'Mainstreaming Climate Change in National Development Processes and UN Country Programming' with a word cloud centered on 'climate change' and 'development'.

- **UNDP:** Screening Tools & Guidelines to Support the Mainstreaming of Climate Change Adaptation into Development Assistance: A Stocktaking Report  
[www.ipcc-wg2.gov/njlite\\_download2.php?id=7316](http://www.ipcc-wg2.gov/njlite_download2.php?id=7316)
- **UNDP:** Mainstreaming Climate Change in National Development Processes and UN Country Programming  
[www.cbd.int/financial/climatechange/g-climateplanning-undp.pdf](http://www.cbd.int/financial/climatechange/g-climateplanning-undp.pdf)
- **CARE:** Mainstreaming Climate Change Adaptation: A Practitioner’s Handbook  
[www.careclimatechange.org/files/adaptation/CARE\\_VN\\_Mainstreaming\\_Handbook.pdf](http://www.careclimatechange.org/files/adaptation/CARE_VN_Mainstreaming_Handbook.pdf)

Box 1 Detailed Guides on Climate Change Mainstreaming

For the *Moldova Climate Change Adaptation Planning Process* Project (see Box 2), the UNDP’s own tool based on its “*Mainstreaming Climate Change in National Development Processes and UN Country Programming: A guide to assist UN Country Teams in integrating climate change risks and opportunities*”, is proposed. This methodological tool provides an analytical approach and structure, which can be applied to projects and programs, but also to strategy documents, plans and policies. It has also been tested and used on national level strategy documents as well as in plans at the local level, whether for general development documents or sector-specific strategies.

### Preparing Moldova’s National Adaptation Planning Process

Development of an integrated National Adaptation Plan requires a concerted effort between institutions and specialists from various sectors and fields of knowledge.

The Project “Supporting Moldova’s National Climate Change Adaptation Planning Process” was established to ensure that Moldova has a system and capacities to develop and implement long term adaptation planning and budgeting with the overall aim of reducing vulnerability of the population and key sectors.

The Project is supported by the Austrian Development Cooperation (ADC) with funding from the Austrian Federal Ministry of Agriculture, Forestry, Environment and Water Management, and implemented by UNDP Moldova in partnership with the Ministry of Environment through its Climate Change Office.

The Project engages national and international specialists focussing on Moldova’s climate vulnerability, as well as solutions for adaptation and building resilience through the strategies, plans and policies governing the most climate-sensitive sectors.

For more information, contact the Climate Change Office:

Email: [clima@mediu.gov.md](mailto:clima@mediu.gov.md) Web: [www.adapt.clima.md](http://www.adapt.clima.md), [www.clima.md](http://www.clima.md)

Box 2 Moldova’s National Adaptation Planning Process



## 1.1 Climate Change and Moldova

Moldova's economy, population, and environment are highly vulnerable to climate variability and change. According to a range of studies, including Moldova's Third National Communication under the United Nations Framework Convention on Climate Change (UNFCCC) and the 2009/2010 National Human Development Report, the impacts of climate change are expected to intensify as changes in temperature and precipitation affect economic activity. The National Adaptation Plan identifies the following priority sectors: agriculture, water resources, health, energy, and regional development.

The following risk factors have been identified in very general terms for Moldova, due to climate change and climate variability:

- Increased surface temperature over land;
- Increased natural disasters (intensity and frequency);
- Increase in annual precipitation and temperature;
- Changes in the frequency and intensity of storms;
- Increase in occurrences of droughts, floods and hail;
- Changes in waterways, increased risk of floods and episodes of accelerated soil erosion;
- Impoverished soils and ecosystems, loss of biodiversity;
- Reduced crop yields;

There are various sources of information on the present climatic conditions and trends and future climate projections and scenarios, which can be useful to frame the probable conditions impacting during the timeline of a policy, plan or strategy (see Box 3).

### Sources of information on climate change projections and impacts

Below is a non-exhaustive list of documents and links to relevant sources of information on climate change, both nationally and globally.

#### National

- **Moldova Climate Change web portal:** Information on climate science, international & national legal frameworks, research & reports, links, contacts. [www.clima.md](http://www.clima.md)
- **Third National Communication to the UNFCCC:** this major Moldovan publication updates information on the country's carbon emissions, climate change projections, climate vulnerability and adaptation needs, and more. <http://tinyurl.com/pp64o5t>
- **National Inventory Report**  
Latest (2013) official Report on Moldova's greenhouse gas emissions. <http://tinyurl.com/o2z48ff>
- **National Climate Change Adaptation Strategy**  
[www.clima.md/doc.php?l=en&id=2529&idc=237](http://www.clima.md/doc.php?l=en&id=2529&idc=237)

#### International

- **IPCC:** The Intergovernmental Panel on Climate Change web portal has much information on climate science, vulnerability and adaptation, and mitigation. The 5<sup>th</sup> Assessment Report, published in late 2014, brings together the latest findings of thousands of researchers from all over the world. [www.ipcc.ch](http://www.ipcc.ch)
- **UNFCCC:** The web portal of the UN Framework Convention on Climate Change is a wealth of information on countries' Climate Action Plans, National Communications, Mitigation Reports, Carbon Finance, international climate negotiations and the preparations of future climate management regimes. <http://newsroom.unfccc.int>
- **Adaptation Learning Mechanism (ALM):** a major portal and resource provided by UNDP and other UN institutions with project information and resources from many countries – including Moldova -, on a wide range of issues such as community-based adaptation, disaster risk management. [www.adaptationlearning.net](http://www.adaptationlearning.net)

Box 3 Climate information sources

## 1.2 Terms and Concepts

In screening for climate risks, and mainstreaming adaptation opportunities into national or sectorial Plans, Policies or Strategies, the most important considerations are Exposure and Sensitivity, Adaptive Capacity and Resilience, and Vulnerability. These are in relation one with the other, as illustrated in Figure 1. In essence, the level of Vulnerability is a function of Exposure and Sensitivity to Climate Change, attenuated by the Adaptive capacity of a societal group, economic sector or system; the higher the adaptive capacity, the lower the level of vulnerability.

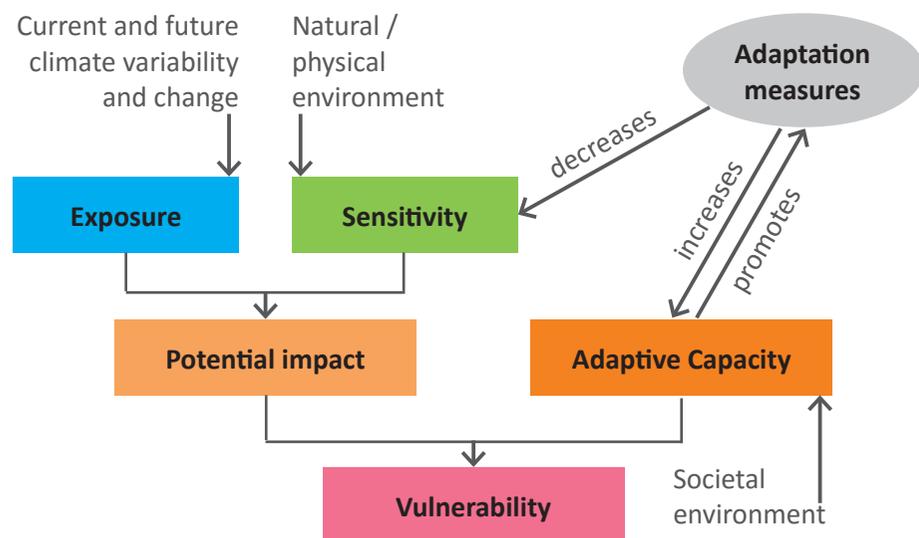


Figure 1 Components of Vulnerability, and the role of Adaptive capacity  
Adapted from Adelphi/EURAC 2014

Familiarisation with the following terms and concepts is useful in order to understand climate and development considerations. The terms defined here are as described in the UNDP Guide referred in Box 1; there are other definitions, but in essence communicate the same thing.

### Adaptation

Adjustments in human and natural systems, in response to actual or expected climate stimuli and/or their effects that moderate harm or exploit beneficial opportunities (IPCC 2007). Adaptation may be spontaneous (triggered by ecological changes in natural systems and by market or welfare changes in human systems) or planned (a result of a deliberate policy decision, based on an awareness that conditions have changed or are about to change and that action is required). It can also be in response to ('ex post'), or in anticipation of ('ex ante'), changes in climatic conditions. Adaptation entails a process by which measures and behaviors to prevent, moderate, cope with, and take advantage of the consequences of climate events are planned, enhanced, developed, and implemented (UNDP 2005).

### Adaptive Capacity

The ability of a system to adjust to climate change (including climate variability and extremes), to moderate potential damages, to take advantage of opportunities, and/or to cope with the consequences. It can also be defined as the property of a system to adjust its characteristics or behavior, in order to expand its coping range under existing climate variability or future climatic conditions (IPCC 2007). A "system" can take the form of a country, a community, a family, or an individual.

### Climate Change

Any change in climate over time, whether due to natural variability or because of human activity (UNDP 2005).

### Climate Change Mainstreaming

The integration of priority climate change adaptation responses into development, so as to reduce potential development risks and take advantage of opportunities. The objective is for adaptation measures to be implemented "as part of a broader suite of measures within existing development processes and decision cycles" (OECD 2009).

### Climate Proofing

The process of guarantying the viability of investments in property or infrastructure, or by improving the viability of an activity, by taking climate change into account. Its purpose is to reduce climate risks to "acceptable levels through long-lasting and environmentally sound, economically viable, and socially acceptable changes" (ADB 2005).

## Climate Risks

The probability of harmful consequences or expected losses (deaths, injuries, property, disruption to livelihoods and economic activities, or environment damaged) resulting from interactions between climate-related hazards and vulnerable conditions.

## Climate Risk Assessment or Screening

A systematic process to determine the nature and extent to which existing development projects and programs already consider climate change risks and opportunities, so as to identify opportunities for incorporating climate change explicitly into future projects (Klein et al. 2007). It involves analysing potential impacts on activities, outputs, and programmes, while evaluating existing conditions of vulnerability that could pose a potential threat or harm to people, property, and/or livelihood, not to mention the environment on which these depend (UNISDR 2004).

## Climate Risk Management

Work that involves climate change adaptation, disaster management, and development. An approach to promote sustainable development by reducing vulnerability associated with climate risks (Hellmuth *et al.* 2007). This approach involves implementing proactive ‘no regrets’ strategies, aimed at maximizing positive and minimizing negative outcomes in climate-sensitive areas such as agriculture, food security, water resources, and health, across communities and larger societies. ‘No regrets’ decisions or actions are those that are expected to lead to positive development outcomes regardless of whether a specific climate threat actually materializes in the future.

## Exposure

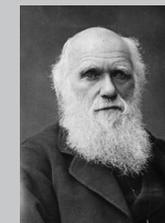
The nature and degree of climatic stress upon a system, including long-term changes in climate conditions and changes in climate variability. To assess exposure, one must consider:

- Effect of change on humans and materials, as well as the change in climate itself (i.e. dependency on scenarios or future climate predictions that do not occur, or actions that lack other benefits);
- Non-equitable vulnerability reductions (or the redistribution of vulnerability from one group to another);
- Inflexible decisions or investments that reduce the possibility of future adaptation;

- Measures that achieve short-term progress and success (increase in wealth) but may cause vulnerabilities in the long-term.

*“it is not the most intellectual of the species that survives;  
it is not the strongest that survives;  
the species that survives is the one that is able best to adapt  
and adjust to the changing environment in which it finds itself.”*

Attributed to Charles Darwin, 19<sup>th</sup> century naturalist and geologist



## Resilience

Capacity of communities to absorb external tensions and disturbances, as a result of social, political or environmental changes. Three conditions enable a social or ecological system to absorb change: ability to self-organize, ability to buffer disturbance, and capacity for learning and adapting (Trosper 2002).

## Sensitivity

The degree to which a system is affected – either adversely/beneficially, directly/indirectly – by climate variability and/or change (IPCC 2007).

## Vulnerability

The degree to which a system is susceptible to, or unable to cope with, adverse effects of climate change, including climate variability and extreme events. Vulnerability is a function of the character, magnitude, and rate of climate variation to which a system is exposed, its sensitivity, and its adaptive capacity (IPCC 2007).

One other term that is sometimes considered as an objective when determining strategic options, whether for climate adaptation or mitigation (reducing carbon emissions, for instance), is “**optimal**”, “**low-**” or “**no regrets options**”. By definition, these are strategic or policy options that have negative net costs, because the costs of implementing the options are lower than the direct or indirect benefits that can be accounted.

The concept of “**gender mainstreaming**” is also an important consideration in relation to efforts to integrate climate change into development processes. This includes identifying, incorporating and integrating the needs and interests of women and men in programmes, policies, strategies, and administrative or financial activities relating to climate change processes.

## 2. Climate Risk Screening and Assessment

The ultimate objective of examining climate risk policies, plans and strategies is to determine whether the basic strategic documents analyze the consequences of climate change in a particular area of interest, despite climatic uncertainties. Experience tells us that new tools and processes work best when integrated into existing systems so that they become intrinsic to the 'day job' and are not onerous to apply. This is a key issue for Moldova and reflects the recognition that tools and processes have to be designed to work within organizations that have competing priorities, capacity challenges and limited resources. Application of these guidelines should help to minimize climate change related loss to public and private investments, leading to more robust policies and more efficient investment projects and, ultimately, more resilient economies. They should help decision makers ensure long-term sustainability and delivery of national development plans.

Climate risk assessment can be described as having a "bottom-up" or "top-down" approach. This has to do with the kind of information that is available, but also the level of analysis, which is desired.

**"Top-down" approach to climate risk/vulnerability assessment:** typically based on scenarios and impact modelling. They are often the basis of longer term planning and strategies. Outputs may be quantitative, risk maps, etc.

**"Bottom-down" approach:** usually rely on local knowledge in identifying risks, involve stakeholder consultations and sectorial experts. They provide for more localized, and often more qualitative results of risk assessment.

### Climate Risk Screening as part of the Climate Mainstreaming effort

In order to successfully integrate, or mainstream, climate change considerations into Strategies, Plans and Policies, it is first important to understand what the future climate risks are.

- Step 1 Create a Climate Country Profile
- Step 2 Prepare an Institutional Map
- Step 3 Involve stakeholders and select the document / plan / strategy to be evaluated
- Step 4 Assess the risks and opportunities of climate change ("climate screening")
- Step 5 Build capacity of stakeholders
- Step 6 Integrate climate change into the chosen document ("climate mainstreaming")

In Moldova, the National Climate Change Adaptation Process project has already developed several important documents identifying the climate country profile, institutional mapping, and assessment of stakeholder knowledge and capacities.

#### Box 4 Climate Risk Screening as part of the Mainstreaming Process

Climate risk assessments can also be carried out **ex-ante** (before the strategy document is finalized, i.e., the climate specialist is working alongside the strategy planning team to ensure that the finished strategy document is already mainstreamed), or **ex-post**, wherein a finished and approved document is later screened. The latter is the most common situation; its utility depends on the willingness of the strategy document "owner" (for instance, a particular Ministry) to formally revise the document with the improvements, or to identify "lessons learned" for the next version of the strategy document, for the next time frame.

An ex-post or **rapid climate risk assessment** can be performed at different levels of analysis. A rapid climate risk assessment (screening) allows for a quick, though superficial, understanding, of obvious climatic risks to a plan, policy or strategy. This type of assessment can easily establish whether the policy, plan or strategy requires a more thorough understanding of the extent and variety of potential risks, or whether a deeper understanding of potential adaptation opportunities needs to be developed. See Figure 4 and Box 10 for more details.

The development of a comprehensive (detailed) climate risk assessment will usually involve a specialist in this field to work with industry and other stakeholders. Typical resources (time, effort), tasks and components for development of a detailed climate risk assessment of a report on climate change risks and opportunities are described in a pragmatic way in Box No. 5.

There are different ways to conduct, and to report, a climate risk assessment. And, depending on the desired results, there are various “climate risk screening tools” which are available on the internet, often developed by academic institutions or international development agencies (see the UNDP publication “Screening Tools & Guidelines to Support the Mainstreaming of Climate Change Adaptation into Development Assistance: A Stocktaking Report”, described in Box 1, for a list and description). These tools, often in an Excel base, provide a means to input specific data and information, and result in standardized reports that enable the comparison with climate risk assessments for other sectors, or time frames.

Assessing Climate Change Risks and Opportunities: Resources required and Outputs expected
<p><b>Objective:</b> Undertake a risk screening analysis of a government development Plan, Strategy, Policy or Program.</p> <p><b>Responsible person:</b> Climate Change Risk Expert</p> <p><b>Work effort:</b> 10 – 20 days per document.</p> <p><b>Tasks involved*:</b></p> <ol style="list-style-type: none"> <li>1. Assess each selected document component for climate change risks, using an appropriate approach, methodology or tool, such as the UNDP mainstreaming approach. The assessment report should include at least the following points: <ul style="list-style-type: none"> <li>• How and where climate risks and opportunities are already incorporated into the Document, and propose improvements if necessary.</li> <li>• Risks of maladaptation.</li> <li>• Adaptation opportunities.</li> <li>• Adaptation measures and/or entry points to better manage climate change risks/opportunities, and a set of priority actions to be implemented by the national entity.</li> </ul> </li> <li>2. Obtain feedback from the document’s stakeholders on the draft findings, potentially during a workshop to build capacity and raise awareness.</li> <li>3. Refine the findings based on these comments and finalize a report.</li> </ol> <p><b>Climate Risk and Opportunities Report outline:</b>  Since this report is to be shared widely with stakeholders, it is useful to include the following sections: <ul style="list-style-type: none"> <li>• Executive Summary</li> <li>• Background to the risk and opportunity assessment, including rationale for selecting the object of the analysis</li> <li>• Methodological Approach</li> <li>• Climate risk assessment results</li> <li>• Recommendations and identification of priority actions</li> <li>• Conclusions</li> <li>• References / Acronyms / Annexes</li> </ul> </p> <p><i>*The work effort will be higher for the first climate risk assessment undertaken and then lower for any subsequent ones. The time required will also depend on the scope of the selected document.</i></p>

Box 5 Assessing Climate Change Risks and Opportunities  
Source Adapted from UNDP: Mainstreaming Climate Change in National Development Processes and UN Country Programming (Reference in Box 1)

Even without the use of such tools, it is possible to develop simplified climate risk assessment that communicates the most obvious and significant risks. The simplest form of a climate risk assessment is a matrix that summarizes the risks and opportunities of climate change adaptation for each component of the strategy, plan or policy (Box no. 6). However, a prerequisite to the development of any climate risk assessment is the establishment of the potential impact of the various climatic factors (such as temperature, precipitation) for each sector or component of a strategy (Box no. 7).

Climate Risks and Adaptation Opportunities Matrix		
A simple matrix like this can help to quickly identify risks and opportunities for adaptation associated with each component of a Plan, Policy or Strategy under review. Identification of significant risk factors should trigger a more detailed climate risk assessment.		
Strategy Component	Climate Change Risks	Adaptation Opportunities
Component A		
Component B		
...		

Box 6 Simple climate change risk/adaptation opportunities matrix

Box 7 (on right) Key factors for climate exposure of land productivity sub-sector, as identified in the development of this guide

Key factors for climate exposure of land productivity sub-sector			
Climate Hazard	Timeframe	Description	
Extreme temperature	Current	Seven of the 10 warmest years in Moldova's history occurred within the last 20 years. Annual temperature has seen a sharp increase since 1980 of about 0.58°C per decade.	
	Future	Annual temperatures are projected to be warmer by about 2-3°C by 2050, with largest warming in northern-part in the summer (June, July, and August). Hot days are projected to increase by 32 days.	
Extreme Precipitation and Flooding	Current	Since 1980 the historical rainfall trend has reversed with an increase in spring (March, April May) rainfall and decrease in summer rainfall. Autumn (September, October, November) and winter (December, January, and February) rainfalls, and annual average precipitation have also seen a gradual increase.  In 2008 Moldova suffered from a flash flood that reached the historical maximum mainly along the Dniester and Prut rivers.  Historical data indicate that Moldova is exposed to a highly variable climate that has already experienced an increase in extreme events	
	Future	Generally climate model projections are for a mild reduction in annual precipitation (by approximately 10-15%) by the end of the century, with drier summers, wetter winters and more variable precipitation (projections range from a 20 mm decrease to a 2 mm increase).	
Drought	Current	In northern Moldova, there is a drought every 10 years. Central Moldova experiences drought every 5-6 years, and southern Moldova every 3-4 years. In the last two decades, droughts have been more frequent and generally more severe. Moldova registered 9 summer drought years between 1990-2007 with significant yield declines in crops and pastures. In 1990, 1992, and 2003 the droughts lasted throughout the whole vegetative period (April-September). The 2007 record catastrophic drought affected 75-80% of the country causing significant economic damage.	
	Future	Predictions are for a mild reduction in annual precipitation by the end of the century, with drier summers and wetter winters. Since summer is a typical cropping season for maize (April - Oct) and wheat (Oct. - July), this could mean increased droughts for crops.	
Legend:			
Not Exposed No Potential Impact No Risk	Slightly Exposed Low Potential Impact Low Risk	Moderately Exposed Moderate Potential Impact Moderate Risk	Highly Exposed High Potential Impact High Risk

This guide elaborates on the UNDP methodological approach for developing a climate risk and opportunity assessment (Section 3, below) that provides a clear and consistent exposition of the main considerations of this kind of assessment. While it provides a tool or structure for noting, on one side, factors of vulnerability to climate and, on the other, opportunities for adaptation, in general terms that can be applied at a national or community level to the population in general, it should be noted that risks and opportunities may impact men and women in different ways. Accordingly, so as not to incur maladaptation in the responses to climate risks, it is important to be sensitive to gender considerations in identifying factors of climate vulnerability and ensure also that efforts to deal with climate risks are equitable (see Box 9).

Gender analysis of Climate Mainstreaming
<p>Both men and women are subject to climate change risks, but the nature and extent of vulnerability may be differentiated between the genders. <b>Gender impact analysis</b> of responses to climate change risks involves the examination of why and how the effects of climate vulnerability and gender inequality are closed linked.</p> <p>The following checklist provides questions to consider when developing or assessing public policy. As discussed in relation to climate risk screening, gender impact analysis can be performed <i>ex-ante</i> (prior to implementation), or <i>ex-post</i> (assessment of the real effects of an existing policy or law)</p>
<p><b>Gender Impact Assessment Checklist:</b></p>
<p><b>Participation:</b> Are numbers of men and women equal, e.g., in terms of the policy's target group, participants of training, beneficiaries of subsidies, etc.? Are men and women participating in equal capacities?</p>
<p><b>Resources:</b> Do men and women have equal access to resources in order to benefit from the policy? (Remember, resources include time, money, information, etc.) Will the policy or programme generate equal resources for men and women?</p>
<p><b>Norms and values:</b> How will gender stereotypes and cultural and social norms and values affect men and women differently in the implementation of this policy? Will stereotypes and values be an obstacle for men or women in fully enjoying the benefits of the existing or proposed policy?</p>
<p><b>Rights:</b> Do men and women have equal opportunity to benefit from the policy? Will the policy affect men's or women's rights directly or indirectly?</p>

Box 8 Integrating gender analysis into climate mainstreaming  
 Source: Gender Mainstreaming in Practice: A Toolkit. UNDP RBEC, 2007

## 3. Application of Climate Risk Screening Methodologies

### 3.1 Climate Risk Management

Climate risk management is a systematic process for selecting the best course of action in uncertain situations. It does this by identifying, understanding, analyzing and communicating risk issues. In adapting to climate change, risk management provides a framework for developing strategies to respond to potential climate changes that create or increase risk. The decision-making process consists of seven steps, as shown in Figure 2.

The key activities in the process of identifying, estimating, evaluating and ranking risks and selecting options to lower risks to acceptable levels include:

- Identifying the risks and opportunities of climate change adaptation that are relevant to planning strategies, policies and plans and projects, specific programs and other activities;
- Guidance and integration of adaptation measures to climate change strategies, policies and new plans as part of the development cycle; and
- Understanding stakeholders' perceptions of probabilities and consequences through continuous dialogue. See Section 4 for more details.

Following the identification of risks and opportunities, specific adaptation measures should be identified to mitigate the risks, improve resilience and take advantage of opportunities. The development of these adaptation measures may require additional considerations on implementation, such as cost, feasibility, potential effectiveness, social acceptability, monitoring and evaluation protocol.

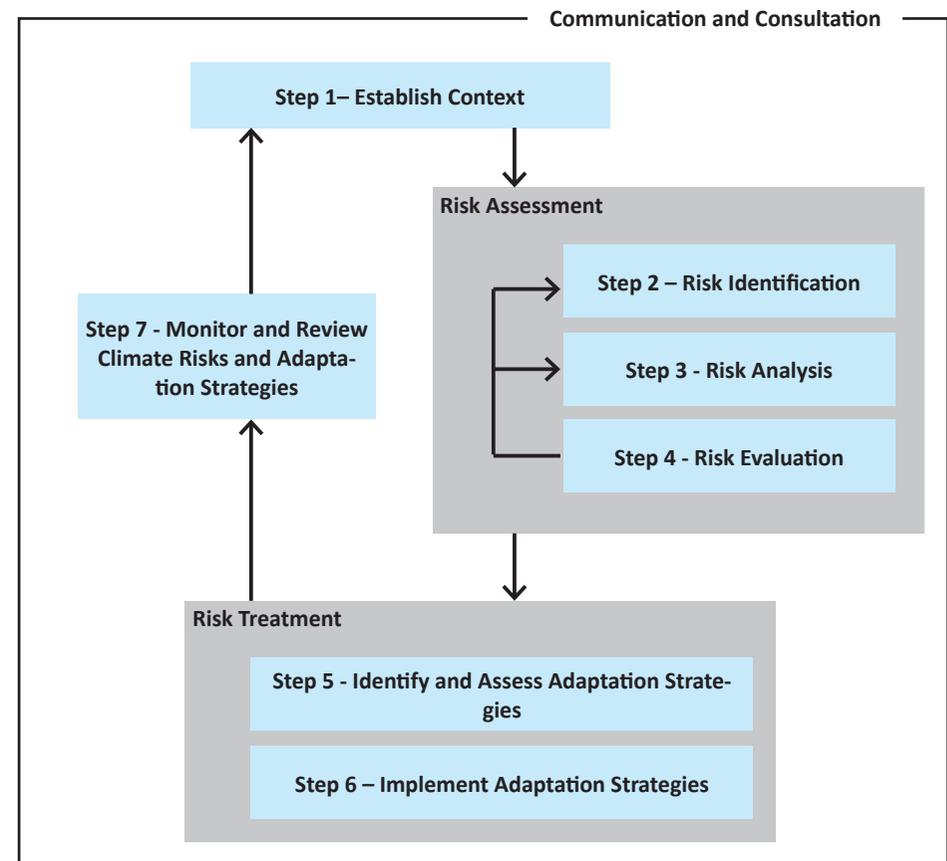


Figure 2 Key steps of the climate risk assessment process. Adapted from source

## National Legislation on EIA and SEA

Common assessment processes that often include climate risk screening include: **Environmental Impact Assessment (EIA)** and **Strategic Environmental Assessment (SEA)** are two important systematic processes for incorporating environmental diligence into planning and decision-making. Both consider a variety of environmental factors (soil, water, health, biodiversity, etc.) including climate change, and both follow the basic principles of EIA (transparency, participation, etc.). But there are key differences as to how they are applied and respective timescale and scope.

### Differences between EIA and SEA

**EIA** aims to achieve a good design for a well-defined objective of the assessment, which is an **Action** or **Project**. As such, it normally deals with actions dealing with Construction or Operations – over a medium to short time-scale. It involves quantitative assessments of specific impacts on the local state of the environment, and emphasizes minimization and mitigation of the negative impacts.

**SEA**, on the other hand, deals with Strategy, Visions and Concepts. Instead of “good design”, as with an EIA, the objective is “good strategy”. SEA are used in the Policy, Planning and Programming levels of decision-making, and therefore have much larger boundaries than EIA in terms of time and space and the coverage of the subject of the process. Accordingly, because of the usually longer temporal horizons of strategies and plans, climate change and variability considerations, including assessments of risks and adaptation opportunities, take on an important significance.

In Moldova, the State Ecological Expertise (Review) System (SEE) and EIA processes are regulated by Law No. 851-XIII of 29.05.1996. The Division of Prevention of Environmental Pollution (Ministry of Environment) is tasked with the coordination of implementation of the EIA process. A formalized national legislative procedure for SEA does not yet exist, though the [Association Agenda Between the EU and Moldova](#) (26.06.2014) states that “EU and Moldova will work together to prepare and implement EU law and international standards, in particular: adopt and implement national legislation and designate competent authorities in the fields of environmental impact assessment, strategic environmental assessment, waste and resource management, water quality and management, air quality, nature protection, industrial emissions and management of chemicals; ...” The EU has issued [Guidance on Integrating Climate Change and BioDiversity into Strategic Environmental Assessment](#).

## 3.2 Application of Climate Risk Screening

The climate risk assessment (screening) process uses the **exposure – sensitivity – adaptive capacity framework** to capture those measures (strategies, policies or plans) that are:

- ‘Climate-influenced’ and may be affected by climate change during the life-time of the measure if the impacts are ignored; and
- Climate adaptation measures, whose main aim is to reduce vulnerability to existing or future climate hazards.

The primary objective of the process is to provide information on the high-level steps that can be undertaken to:

- Evaluate measures (strategies, policies, plans, actions or projects) for their sensitivity to climate variability and climate change;
- Identify those measures for which additional analysis will be required;
- Help manage the risks arising from climate change by ensuring that investment decisions will lead to the delivery of outputs that are resilient to climate variability and change; and
- Complement existing national and sectoral documents and strategies and integrate within the National Adaptation Planning Process.

The overall steps of the screening process are described below in Figure 3. The climate risk screening process may not proceed in a linear process, and in practice some steps may be performed in combination.

Box 9 (on left) Moldovan EIA and SEA legislative frameworks

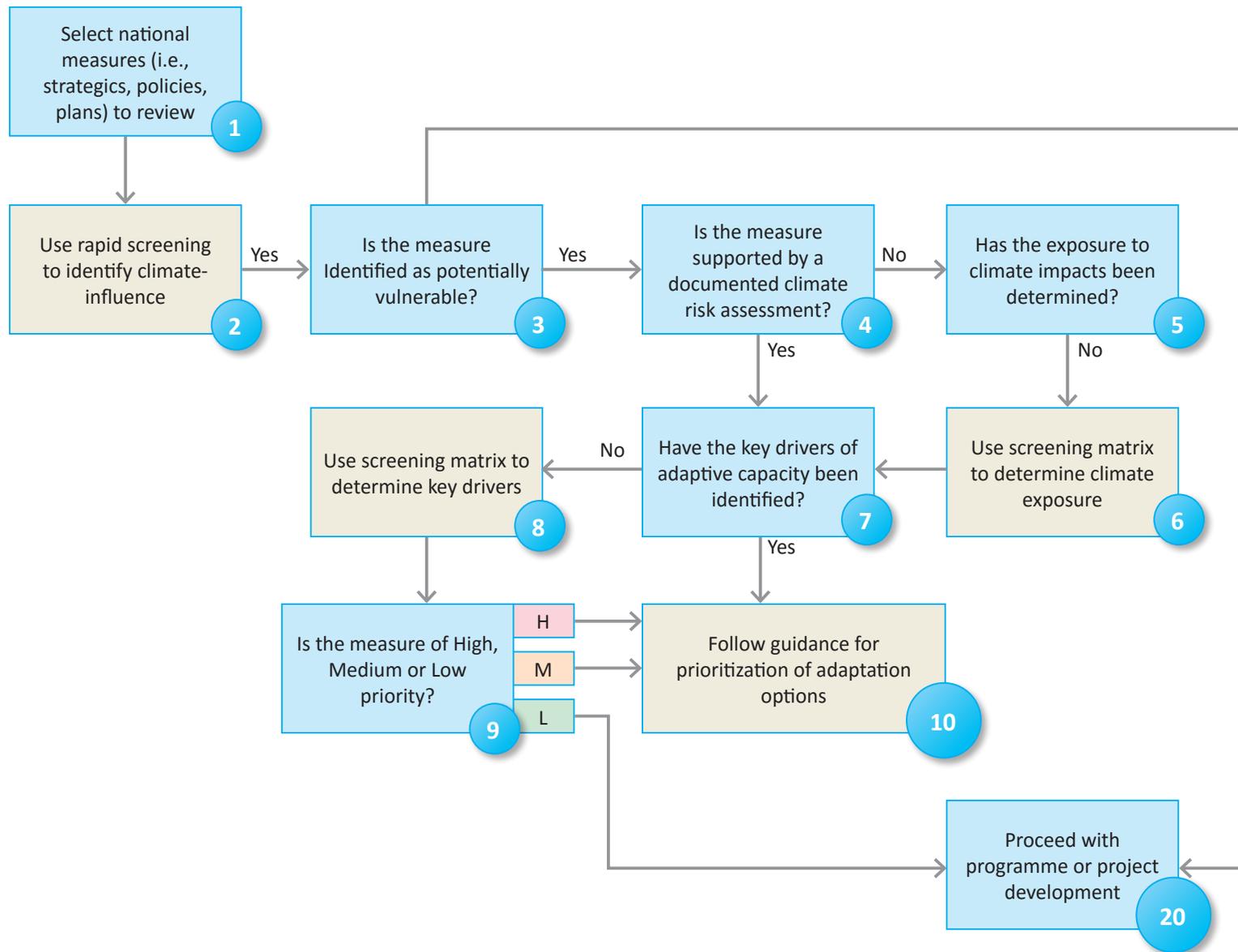


Figure 3 Climate screening flowchart (Part A)

The key steps of the climate screening process (Figure 3) are outlined below.

## Step 2

The initial, rapid climate risk assessment (Box 10) recognizes that organizations have to prioritize efforts and resources. It provides a rapid and easy to use screening process that highlights those measures that are potentially climate influenced and in need of further assessment.

The scores for priority measures have 3-levels:

- **High Priority (score of 7 or above):** This is a climate-influenced measure of high priority that requires further assessment.
- **Medium Priority (score of 5 – 6):** This is a climate-influenced measure of medium priority. Climate change is likely to threaten or diminish outcomes for this measure. It is advised to continue assessing this measure, unless time and/or resources do not permit. It is also recommended that international resources be reviewed for any readily available information that support the decision making process.
- **Low Priority (score of 4 or below):** This may be a climate-influenced measure but it is a low priority one. Given limited time and resources, it is not necessary to further assess this measure.

Box 10 (on right) Rapid climate risk assessment exercise for prioritizing national level policies and/or strategies

Rapid climate risk assessment exercise for national level policies and/or strategies		
The rapid climate risk assessment exercise is based around 10 questions that do not require any prior climate change knowledge or expertise. Each question has a yes or no response, with each yes response scoring 1 point (except question 10, which scores 3 points because of the relative importance of national development planning and its critical role in building resilience). It is anticipated that over time the questions will need to be reviewed and updated to reflect a growing understanding of climate influences and national priorities.		
Is the measure located in or relevant to a specific environment/area, ecosystem or any other environmentally sensitive area?	Yes	No
Will the outcomes of the measure last longer than 10 years? Measures with longer-term outputs or effects will be exposed to an increasing range of climate change variability.	Yes	No
Does the measure involve priority sectors (as identified in the National Development Plan)?	Yes	No
Are any existing or similar measures already experiencing impacts due to adverse weather conditions?	Yes	No
Is the measure, once implemented, irreversible and inflexible? Measures with inflexible outputs (that cannot be periodically reviewed and adjusted) should be given increased attention	Yes	No
Does the measure focus on vulnerable population groups as a primary target? Socio-economic characteristics (such as low income and education levels, female to male ratio, percentage of children, elderly, those in poor health and disabled) shape population sensitivity and adaptive capacity and contribute to the overall vulnerability to climate change	Yes	No
Will the measure contribute to improving disaster risk management? A measure that contributes to improving disaster risk management (DRM) should be given increased attention regarding climate risk	Yes	No
Is the measure dependent upon the availability of national, or locally, critical infrastructure?	Yes	No
Will the measure require a significant investment of annual capital and/or operational expenditure by Ministry/ organization? Any investment of more than 5% of annual capital and operational expenditure should be thoroughly assessed for all types of risk, including climate risk.	Yes	No
Will the measure deliver or make a significant contribution towards the achievement of priority objectives in the national development plan?	Yes	No

## Step 6

**Are there any climate risks that could influence this measure (strategy, policy or plan) or sub-sector?**

Climate change impacts can vary depending on a combination of factors. Once the measure or sub-sector to be examined has been identified (see Step 1), its **individual** exposure to the key climate drivers – the key hazards that pose the biggest potential threat to it – need to be determined for current and future conditions (see Box 11).

The future timeframe should be projected from the most likely the 2040-2059 average based on global, quality-controlled datasets. See data for Moldova: <http://tinyurl.com/p3ch7w5>

### Example of selected review measure:

**Improve sustainable land management to enhance competitiveness in agricultural sector**

Box 11 (on right) Key factors for climate exposure of land productivity sub-sector for the measure: Improve sustainable land management to enhance competitiveness in agricultural sector

Key factors for climate exposure of land productivity sub-sector		
Climate Hazard	Timeframe	Description
Extreme temperature	Current	Seven of the 10 warmest years in Moldova's history occurred within the last 20 years. Annual temperature has seen a sharp increase since 1980 of about 0.58°C per decade.
	Future	Annual temperatures are projected to be warmer by about 2-3°C by 2050, with largest warming in northern-part in the summer (June, July, and August). Hot days are projected to increase by 32 days.
Extreme Precipitation and Flooding	Current	Since 1980 the historical rainfall trend has reversed with an increase in spring (March, April May) rainfall and decrease in summer rainfall. Autumn (September, October, November) and winter (December, January, and February) rainfalls, and annual average precipitation have also seen a gradual increase.  In 2008 Moldova suffered from a flash flood that reached the historical maximum mainly along the Dniester and Prut rivers.  Historical data indicate that Moldova is exposed to a highly variable climate that has already experienced an increase in extreme events
	Future	Generally climate model projections are for a mild reduction in annual precipitation (by approximately 10-15%) by the end of the century, with drier summers, wetter winters and more variable precipitation (projections range from a 20 mm decrease to a 2 mm increase).
Drought	Current	In northern Moldova, there is a drought every 10 years. Central Moldova experiences drought every 5-6 years, and southern Moldova every 3-4 years. In the last two decades, droughts have been more frequent and generally more severe. Moldova registered 9 summer drought years between 1990-2007 with significant yield declines in crops and pastures. In 1990, 1992, and 2003 the droughts lasted throughout the whole vegetative period (April-September). The 2007 record catastrophic drought affected 75-80% of the country causing significant economic damage.
	Future	Predictions are for a mild reduction in annual precipitation by the end of the century, with drier summers and wetter winters. Since summer is a typical cropping reason for maize (April - Oct) and wheat (Oct. - July), this could mean increased droughts for crops.

Legend:

Not Exposed No Potential Impact No Risk	Slightly Exposed Low Potential Impact Low Risk	Moderately Exposed Moderate Potential Impact Moderate Risk	Highly Exposed High Potential Impact High Risk
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## Step 8

*Have the key drivers that could significantly influence the delivery and future success of this measure (strategy, policy or plan) or its requirements been identified?*

The screening matrix (Box 12) allows decision-makers to assess the extent to which the three main components of adaptive capacity contribute to the reduction and management of potential climate impacts on the selected measure or sub-sector.

## Step 9

What steps should be taken next?

- If the overall results of Step 8 **slightly or significantly increase impacts**, this is a measure of lower climate related priority. Proceed to **Step 20** unless time and resources are available for additional review and inputs.
- If the overall results of Step 8 **slightly reduce impacts**, climate change is likely to threaten or diminish outcomes for this measure and it should be considered for extra attention, if time and resources are available. Proceed to **Step 10**
- If the overall results of Step 8 **significantly reduce impacts**, climate change makes this planned measure of high priority, proceed to **Step 10**.

Box 12 (on right) Key drivers of risk for soil and land management aspect of the measure: Improve sustainable land management to enhance competitiveness in agricultural sector

Key drivers of risk for soil and land management aspect			
	Current	Future	
<b>Development Context:</b> Does the sector's enabling environment (i.e., economic, political, technical and social environment) increase or reduce risks from the climate impacts identified in Step 1?			
<b>Sector: Institutional capacity</b>			
Awareness of climate and geophysical hazards	Yellow	Orange	
Ability to conduct risk and impact assessments	Pink	Pink	
Ability to plan and implement adaptation measures	Pink	Pink	
Adaptive management capabilities	Pink	Pink	
<b>National context</b>			
Land and soil quality	Pink	Pink	
Financial resources	Orange	Orange	
<b>Non-Physical Components:</b> Do the <b>specific</b> non-physical components of the sub-sector or measure increase or reduce risks from the climate impacts identified in Step 1? Sectors that show moderate to high risk from climate hazards will likely require attention if national goals are to be realized			
Capacity building and training	Yellow	Yellow	
Agricultural extension and research	Yellow	Yellow	
<b>Outcome / Service Delivery:</b> What is the level of risk posed to the outcome / service delivery by the climate impacts identified in Step 1?			
Infrastructure services	Orange	Orange	
Technical or operational practices	Red	Red	
Lifetime (i.e., how long will the output last: less than 10 years, 10 – 20 years or more than 20 years)	Orange	Orange	
<b>Overall</b>	Orange	Orange	
<b>Legend:</b>			
Significantly Reduces Impact	Slightly Reduces Impact	Slightly Increases Impact	Significantly Increases Impact

### 3.3 The 4 Principles of the UNDP Methodology

The climate risk screening process (Section 3.2) also incorporates within it the four key principles that underpin the UNDP methodology for identifying climate risks, risks of maladaptation, opportunities for adaptation and specific adaptation measures.

#### 1. Identification of Climate Change Risks to Strategies, Policies or Plans (or Programs and Projects)

Strategy or Policy components are assessed to determine whether their viability or longer-term sustainability is threatened by climate change. This involves the identification of components that are sensitive or vulnerable to emerging or anticipated manifestations of climate change (e.g. changes in extreme events, or longer term changes in average climatic or environmental conditions).

#### 2. Identification of Risks that May Result in Maladaptation

Unintended and unforeseen increases in vulnerability may result from Policies, Strategies or Plans that do not consider changing climatic conditions over time. Policy and Strategy components are assessed for their potential to increase long-term environmental or societal vulnerability to climate change and variability. This might require a cross-evaluation between sectors, for actions that might be contradictory between them.

#### 3. Identification of Adaptation Opportunities

Adaptation opportunities may include entry points to: (i) facilitate adaptation through synergies with existing or planned initiatives, (ii) combine mitigation (reductions in greenhouse gas emissions) and adaptation, (iii) deliver additional development benefits, and/or (iv) exploit potentially beneficial changes in climatic or environmental conditions.

#### 4. Assessment and Integration of Potential Adaptation Measures

Policy and Strategy planners and managers translate the identified adaptation opportunities into changes that can be integrated in a strategy document. These measures may include the re-evaluation of the Policy or Strategy objectives and intended outcomes, changes to outputs and activities, or policy recommendations. Adaptation measures are assessed and prioritized on the basis of feasibility, efficacy, and acceptability, and then integrated into the strategy document.

The following matrix summarizes the UNDP approach to assessing Climate Change Risks and Opportunities and the type of questions that can be asked in each stage (Box 13).

The UNDP screening process starts from the “risks” side (left) that identifies the climate risks to which the Strategy, Policy or Plan is subject, or where vulnerability is in fact increased through the implementation of the Strategy document. Then, the “opportunities” side is completed. Each adaptation opportunity, or recommendation for improving resilience, can be matched to respond with a solution to a particular climate risk, though there may also be wider adaptation or resilience recommendations that improve the strategy document.

Preliminary results of climate risk and opportunity screening using this methodological approach, on the Moldovan Strategy documents for the Energy and Transport sectors are provided in matrix form in Boxes 14 and 15, respectively.

## Simplified matrix for UNDP approach for climate risk screening reporting

Following is the UNDP methodological approach for climate risk screening and reporting, indicating the order in which the sections are developed following a rational sequence. The matrix can be used to systematize and organize the thinking and responses to the following non-exhaustive list of questions.

Climate Change Risks	Adaptation Opportunities
<p><b>1. Sensitivity to climate change and variability</b></p> <ul style="list-style-type: none"> <li>- Is the activity affected by climate variability?</li> <li>- What are the assumptions about future climate conditions?</li> <li>- Are there other areas which are indirectly sensitive (ex. Governance)</li> </ul>	<p><b>4. Viability: Feasibility of the Plan, Policy or Strategy in light of climate change</b></p> <ul style="list-style-type: none"> <li>- Does the activity presume continuity of the present climate scenario?</li> <li>- Does the activity need to be reconsidered or re-structured?</li> <li>- Can the activity be made “climate proof”?</li> </ul>
<p><b>2. Climate Hazards</b></p> <ul style="list-style-type: none"> <li>- Which hazards are presently identified?</li> <li>- Future hazards foreseen, including long term hazards</li> <li>- What is the level of uncertainty?</li> </ul>	<p><b>5. Reducing vulnerability and Increasing Adaptive Capacity</b></p> <ul style="list-style-type: none"> <li>- Which alterations/interventions (measures) can be identified?</li> <li>- Can these be integrated into the activity in its presently planned form, or as a separate activity/project?</li> <li>- What is the level of knowledge and awareness (of stakeholders, operators, beneficiaries...)</li> </ul>
<p><b>3. Risks from climate change and variability</b></p> <ul style="list-style-type: none"> <li>- Which are the most relevant risks to the activity?</li> <li>- Characteristics of the risk to the activity, and how it is vulnerable;</li> <li>- Are there potential indirect risks (ex. distraction of attention or diversion of resources from other priority areas)</li> <li>- Do the risks affect the population in a homogenous way? Are women and men affected by differently by the risks from climate change and variability?</li> </ul>	<p><b>6. Maladaptation avoidance: identification of risks of maladaptation of the Plan, Policy or Strategy proposed, or of the adaptation measures themselves</b></p> <ul style="list-style-type: none"> <li>- Do the proposed adaptation measures make sense, even in the absence of predicted climate change impacts?</li> <li>- Do the measures maximize the results, and are they flexible?</li> <li>- Can the measures result in “winners” and “losers”? Do women and men benefit equitably from the proposed policy?</li> <li>- Are there negative impacts arising from the measures themselves?</li> </ul>
	<p><b>Costs</b> associated with the proposed measures;</p> <p><b>Prioritization</b> of measures for implementation;</p> <p><b>Other considerations</b>, including monitoring and assessment recommendations</p>

Box 13 UNDP. 2012. Mainstreaming Climate Change in National Development Processes and UN Country Programming: A guide to assist UN Country Teams in integrating climate change risks and opportunities

## Climate Change Risks and Opportunities for Adaptation in the Energy Strategy of the Republic of Moldova until 2030

Component	Climate Change Risk	Opportunities for Adaptation (and avoiding maladaptation)
<b>Natural gas sector</b>	<ul style="list-style-type: none"> <li>Increased natural gas consumption due to rising domestic electric charge;</li> <li>The deterioration of environmental conditions for crop growth forest climate, it poses a serious threat to energy production from biomass.</li> </ul>	<ul style="list-style-type: none"> <li>Implementing energy efficiency measures;</li> <li>Sorting of waste and biogas from biodegradable household waste;</li> <li>Implementing projects for installation of solar collectors for domestic hot water heating;</li> <li>Increase consumption of natural gas in areas where there will be shortage of combustible materials (pellets, briquettes, bales of straw).</li> </ul>
<b>Electric energy sector</b>	<ul style="list-style-type: none"> <li>Increased demand for electricity caused by the increase in summer temperature and the need for indoor air climate;</li> <li>Increased demand for electricity for irrigation caused the decline in soil moisture insurance;</li> <li>Increased electricity losses due to rising air temperatures and lengthening the duration of the cooling system operating electrical equipment;</li> <li>Increased duration of unplanned interruptions to electricity supplies increase the frequency of cases caused by wildfires in the protection of overhead lines;</li> </ul>	<ul style="list-style-type: none"> <li>Insulation of buildings and promoting modern room-conditioning systems (eg heat pumps);</li> <li>Develop programs coordinated development of power grids and construction of farmland irrigation stations;</li> <li>Develop regulations on electrical equipment requirements limit to the new prosecutor, to reduce the climate impact on electricity networks and reducing energy losses;</li> <li>Strengthen the regulatory framework for the promotion of energy efficient technologies within energy companies (including the approval of tariffs and enabling long-term reinvestment of savings achieved from reducing losses);</li> <li>Create common regulation of the Ministry of Economy, Ministry of Environment and other stakeholders, the protection areas of networks;</li> <li>Electric energy market liberalization and integration into ENTSO-E. Implementation of differentiated tariffs for electricity and construction in the southern republic of pump-storage hydropower plants (CHEAP) to settle the load curve in the national energy system.</li> </ul>
<b>Thermal energy sector</b>	<ul style="list-style-type: none"> <li>Reduce heat demand due to rising mean annual temperature and shortening the cold period;</li> <li>Decrease capacity of generating electricity and heat at power plants District (CET) caused by insufficient thermal load;</li> <li>Increase water losses caused by the diminishing capacity of the cooling towers MGRES condensation heat.</li> </ul>	<ul style="list-style-type: none"> <li>Implement technologies cogeneration heat and power based on gas turbine combined cycle steam turbine;</li> <li>Create near CHPs and MGRES of free economic zones for economic production from fields in technological processes using steam;</li> <li>Construction in nearby MGRES CHPs and refrigerators to preserve fruit and vegetables, producing cold with steam.</li> </ul>
<b>Energy efficiency sector</b>	<ul style="list-style-type: none"> <li>Increase energy intensity caused by the increase in electricity consumption for air conditioning and irrigation;</li> </ul>	<ul style="list-style-type: none"> <li>Insulation of buildings;</li> <li>Energy labeling;</li> <li>Implement building energy performance certificates;</li> <li>Introduction of new forestry crops with higher tolerance to heat stress and water scarcity;</li> </ul>
<b>Renewable energy sector</b>	<ul style="list-style-type: none"> <li>Decrease power generation capacity of HPP caused by diminishing water flow in the rivers Prut and Nistru result of lower rainfall;</li> <li>Diminishing quantities of biomass due to higher occurrence of droughts;</li> <li>Reduce the quota of renewable energies in the electricity system that ensures stability due to decreasing availability of balancing energy;</li> <li>Reduce crop capacity growth will cause oily liquid biofuels produced smaller amounts.</li> </ul>	<ul style="list-style-type: none"> <li>The construction of wind farms, where wind potential will increase due to the increase in mean annual temperature;</li> <li>The construction of solar power stations (photovoltaic) generation potential had risen;</li> <li>Electric energy market liberalization and integration into ENTSO-E. Implementation of differentiated tariffs for electricity and construction in the southern republic of pump-storage hydropower plants (CHEAP) to settle the load curve in the national energy system.</li> </ul>

Box 14 Preliminary results of Climate Change Risk and Opportunity Screening of the Moldova Energy Sector

Source Aparatu, S., 2014 as part of ADA/UNDP Project to support the National Climate Change Planning Process

## Climate Change Risks and Opportunities for Adaptation in the Moldova Transport and Logistics Strategy 2013-2022

Sector	Risk	Opportunities to adapt
Transport	Significant variations in temperature	<ul style="list-style-type: none"> <li>• Development of new materials for use in road construction that is resistant to high temperatures.</li> <li>• Design and construction of street pavement tolerant to heat waves.</li> <li>• Grinding cracks roads</li> <li>• Adapt stations harmless cooling systems.</li> </ul>
Transport	Intense rainfall	<ul style="list-style-type: none"> <li>• Use of road asphalt that is more resistant to cracking.</li> <li>• Promoting technologies of asphalt sealing against water intrusion.</li> <li>• Promoting effective road maintenance technologies.</li> <li>• Assess the impact of new roads climate change.</li> <li>• Improve flood protection.</li> <li>• Improving monitoring water levels.</li> <li>• Upgrading drainage for roads.</li> </ul>
Transport	<ul style="list-style-type: none"> <li>▪ Surface deformations caused by temperature asphalt, rain, snow.</li> <li>▪ Reduced public transport circulation and / or increased costs that will affect first of all vulnerable groups (including older women, children, etc.)</li> </ul>	<ul style="list-style-type: none"> <li>• Upgrading technology design, construction and maintenance of roads in the context of climate change.</li> <li>• Restrict traffic in extreme periods (winter and summer).</li> <li>• Speed limits on certain sections of road.</li> <li>• Prohibit movement of vehicles weighing more than the allowed limit.</li> <li>• Development of affordable transportation networks, especially in rural areas</li> </ul>
Transport	Damage to bridges and viaducts caused by heavy rains	<ul style="list-style-type: none"> <li>• Replacing the pavement on bridges and viaducts.</li> <li>• Covering deformed pavement surfaces on bridges with a protective layer</li> <li>• Restrict traffic on bridges and viaducts.</li> <li>• Construction of reservoirs around bridges</li> </ul>
Transport Air	Surface deformation of runways for takeoff and landing aircraft	<ul style="list-style-type: none"> <li>• Restrict take off and landing aircraft during heat waves.</li> <li>• Lengthen runways.</li> </ul>
Roads	Damage to the health of technical personnel involved in the maintenance and repair of roads	<ul style="list-style-type: none"> <li>• Use of specialized equipment.</li> <li>• Shortening working days.</li> <li>• Increase the frequency of medical reviews</li> </ul>
Transport Naval	Navigation routes become impassable due to low water levels or climate events (droughts and floods that hit).	<ul style="list-style-type: none"> <li>• Creating a specialized body for the management of waterways.</li> <li>• Equipping ports with facilities and equipment for collection, storage and use of waste from ships.</li> <li>• Procurement of equipment necessary for cleaning river beds</li> <li>• Construction of additional ports.</li> <li>• Procurement of equipment adapted to the waterway use</li> <li>• Widening rivers.</li> <li>• Continuous maintenance of navigable routes.</li> <li>• Planting forest bands on river banks.</li> <li>• Construction of overflow water reservoirs</li> </ul>

Box 15 Preliminary results of Climate Change Risk and Opportunity Screening of the Moldova Transport and Logistic Strategy 2013-2022

## 4. Engaging Stakeholders

The success of the mainstreaming effort, over the short to medium terms, depends largely on the extent to which stakeholders have been engaged to participate in, inform and be informed on how climate change impacts development and vice versa. Stakeholders may include many different actors, such as from national ministries and agencies, civil society organizations, academic or research institutions and the private sector, as well as simply concerned citizen. When the subject is the mainstreaming of strategy documents, whether at national, regional or sectorial levels in Moldova, then the main stakeholders may be representatives of the Ministries and associated agencies.

Stakeholder engagements often include focussed, individual consultations - for instance, meeting with Ministry representatives to discuss the rationale, benefits and procedure for mainstreaming a sectorial strategy or planning document or process - or workshops. Workshops are important opportunities for informing participants about the issue of climate change, its impacts and adaptation opportunities. Participants can also be a source of useful feedback, information and perspectives. From the experience of a Seminar and Training Workshop on Climate Risks and Opportunities in Moldova's Planning (see Box 14, below), it can also be an excellent forum to strengthen inter-institutional dialogue and cooperation.

Experience from various UNDP-run workshops on integrating climate change into the development process shows that sessions which focus on "hands-on" exercises are popular, as they allow a real integration of the information and material presented, and participants can exchange and reflect on their own experiences as well as the position of their respective institutions. Workshop events can fulfil the following objectives<sup>1</sup>:

- Enhance participants' understanding of climate science and concepts;
- Present the summary results of the Country Climate Profile;
- Present the climate risk assessment methodology;
- Share and validate draft results of sectorial climate risk assessment;
- Enhance participant's capacity to identify climate change risks and opportunities, as well as adaptation measures;
- Raise awareness of national authority stakeholders on the importance of integrating climate change into development processes;
- Encourage inter-institutional collaboration through the exchange of tools, data and experience.
- 

### Engaging stakeholders at the District level

A District-level training program on climate change, risk assessment, and Community Based Adaptation options was organized by the Climate Change Office.

The training sessions took place in early 2015 in Singerei, Falesti and Nisporeni towns, with the participation of Municipal planners, local civil society organizations, farming associations and local businesses.



Box 16 District level seminar

<sup>1</sup> UNDP (2011). Mainstreaming Climate Change in National Development Processes and UN Country Programming: A guide to assist UN Country Teams in integrating climate change risks and opportunities. United Nations Development Programme: New York, NY, USA

## “Screening for Climate Risks and Opportunities in Moldova’s Planning” - A Seminar and Training Workshop

As part of the commitment to improve knowledge and capacity of public sector professionals involved in planning and policy, in the frame of the Project to support the National Climate Change Planning Process, the Climate Change Office, together with UNDP Moldova, organized a training seminar and workshop in Chisinau, 16-17 December 2014, for representatives from various Ministries and public agencies.

The seminar included national and international experts sharing their knowledge on climate science globally and as it pertains to Moldova, methodologies for assessing climate risks and mainstreaming climate into national development planning. It focussed on initial results of climate risk screening of Moldova’s transport and energy sectors. In the workshop session, participants worked in groups and focused on the regional development sector in order to identify and prioritize the most relevant adaptation measures.

The program was as follows:

### Session A: Introduction and fundamentals

- Introduction to the National Adaptation Planning Project;
- Climate Change: basic climate science and projections;
- Key concepts in climate change and management of its impacts;
- Mainstreaming: integration of climate risks and opportunities into Strategies;

### Session B: Tools and methodologies

- Assessing Adaptation Costs & Benefits, and Prioritization of Measures;
- Screening for climate risks & opportunities: a methodological approach;

### Session C: Sectorial case studies

- Energy and Transport in Moldova; Adaptation and Food Security in a small island developing state

The full package of documentation from the seminar can be downloaded from [www.adapt.clima.md](http://www.adapt.clima.md)



Box 17 Screening for Climate Risks and Opportunities Seminar and Workshop

## 5. Integrating Climate Change into the Selected Strategy Document(s)

After establishing the country's climate profile, understanding who the key stakeholders are and their roles and influence, and having carried out an assessment, or screening, of the climate risks and possible adaptation opportunities for a given sector, the principal considerations can then be "mainstreamed", or integrated, into the particular strategic document such as a Sector, Plan or Policy.

The objective of the climate change mainstreaming process for a strategy document is to address pertinent climate risks, and integrate priority adaptation responses such as to reduce risks and prepare to take advantage of the potential opportunities in the specific sector or strategy. As discussed further below, this work is usually carried out by a consultant or an implementation team, in coordination with the stakeholders and in particular with the document "owner", i.e. the Ministry or agency which is politically or administratively responsible for implementing the strategy, policy or plan.

One of the decisions to take early on by the implementation team with the document "owner" is whether it is more useful and appropriate to:

- **elaborate a report or note** with recommendations for the integration of climate risks and opportunities into the selected strategic document; or whether it is preferable to
- **revise the strategic document** itself and annotate directly the recommended changes.

There are usually two different ways in which the mainstreaming effort can be conducted; each has benefits and conditioning factors:

- **"Active" mainstreaming with stakeholders:**  
The Implementation team / consultant works very closely with the relevant stakeholders, whether through focussed meetings or technical group meetings. Recommendations for improving the strategy document, based on identified climate risks or opportunities

for adaptation, are discussed and integrated into the document by the lead stakeholders themselves, in a process which is supported and facilitated by the implementation team.

- **"Passive" mainstreaming:** in this case, the Implementation team / consultant follows carries out the climate risk assessment independently and submits the recommendations to the stakeholders or document "owner". The document "owner" institution then integrates the recommendations in the strategy document through their own processes and timing, and can call upon the Implementation team for support or responses to queries.

The mainstreaming effort can be a tremendous opportunity to inform stakeholders and build capacity of governments and national institutions. Accordingly, the "active" process of mainstreaming, in a strong collaboration between the document "owner" institution, other relevant stakeholders and the Implementation team, is best for building capacity in the medium term. However, this requires resources of all the participants. The context, timing, and level of interest and engagement of the stakeholders will determine if the "active" process is possible, or whether the "passive" process is more suitable if quicker results are needed.

How a strategy document is mainstreamed, in practice, varies from case to case and depends on various factors:

- **The kind of document** For instance, is it a focussed policy, perhaps pertaining to a particular sector or even sub-sector, or a wide-reaching strategy which can involve various sectors or interests?
- **Timing** Does the mainstreaming procedure follow a process-based approach or an end-results oriented approach? The former is useful to build capacity through a participatory process, but will take longer than the latter carried out by a consultant or small team.
- **Pertinence** The activities in the mainstreaming effort should be aligned with the natural cycles of the strategic document and partner institutions in order to be successful. This requires flexibility and accommodation by the implementing team to maximize opportunism.

- **Degree or interest** The interest by authorities or the document “owners”, such as the respective sector’s Ministry, is paramount to the success of the mainstreaming effort. There should be a clear mandate and sense of priority by the document “owner” or respective authorities to the implementation team, and signals that recommendations will be incorporated into strategy document design or review processes.

This is a very important point. The success and effectiveness of the mainstreaming effort involves the consideration of commitment and priority of the document “owner” and respective decision-makers. However, as is the case in Moldova, policy makers and planners alike from different Ministries may not be fully informed of the needs and benefits of mainstreaming climate risks and adaptation opportunities into their sector’s strategies, policies and plans and respective strategic documents. Therefore, it will be important to first engage and inform on this issue. With the increasing attention on climate change, governments and state bodies such as Ministries and parastatal organizations will tend to become more alerted and even pressured to address climate change more consistently and strategically. More than just an institutional obligation, this is also important in order to access climate funds for both mitigation and adaptation projects or activities.

Boxes 18 and 19, provide comments on the integration of climate change considerations in the main Moldovan Strategy documents for two of Moldova’s priority sectors: Transport and Energy.

**Climate Change and the Transport Sector Strategy**

With about 90% of the country’s GDP coming from trade between EU and former Soviet Union countries, and with an economy depending on agriculture and agro-economy, access to regional markets is a strategic priority, depending on a well functioning transport industry and a solid transport infrastructure. However, the transport sector has received a low share of public expenditure, and, among several critical issues, almost 80% of national roads and 90% of local roads have reached the end of their economic life and are technically outdated<sup>2</sup>.

The “Strategia de transport și logistică pe anii 2013-2022” (Hotărîrea Guvernului nr.827) is the key reference for Moldova’s Transport sector. It does not acknowledge climate change as a pressuring factor for the conditions of transport infrastructure or the operation of different transport modalities over time with climate change, and in particular, with climate variability, though floods and other extreme weather events have caused the deterioration of roads and knocked out bridges in different parts of the country. Given the strategic importance of the sector at the national level, and the relevance of the climate change and variability impacts to transport infrastructure and industry, it is considered one of the “priority areas” under the “Supporting Moldova’s National Climate Change Adaptation Planning Process” Project.

The Climate Change Office is working with the Ministry of Transport to identify climate change and variability risks to the transport sector, looking into each specific sub-sector (road, air, naval/river transport, etc.). The work also includes identifying concrete opportunities for integrating good practise, innovative materials and appropriate planning for climate risks, which are components of “climate proofing” efforts. A succinct listing of climate change and variability risks, as well as adaptation ideas for the transport sector, are presented in Box 15, above.

Climate change risks to the transport sector are becoming better understood, as are technological, technical, planning and policy responses. The UNECE publication, “Climate Change Impacts and Adaptation for International Transport Networks” (UN, 2013) provides a good overview of the climate change implications for transport, potential adaptation measures, and discusses various case studies. For Moldova, at a critical time when a significant proportion of its transport – and in particular, road – infrastructure is up for renewal, it is imperative that best available techniques and planning are taken into consideration in order to optimize the safety and endurance of the public investments made.



Box 18 Climate Change and the Transport Sector Strategy for Moldova

<sup>2</sup> World Bank Transport Sector Review Update for Moldova: <http://tinyurl.com/qce42gk>

## Climate Change and the Energy Sector Strategy

The key strategy document for the Energy sector in the Moldova is the Energy Strategy up to 2030 (HOTĂRÎRE Nr. 102 din 05.02.2013). It establishes a series of general strategic objectives for the period 2013-2030, as well as Specific Objectives for the period in two phases (2013-2020 and 2021-2030). These include, *inter alia*, objectives concerning security of energy supply issues, Moldova's position in transmission networks, improving energy efficiency and increasing the use of renewable energy sources, and ensuring integration with legal, institutional and operational frameworks for competition and pricing in accordance with agreements with the EU.

The document acknowledges climate change from the perspective of mitigation, i.e. to acknowledge the impact of the energy sector on greenhouse gas emissions and commitments to reduce emissions through efficiency measures on both the supply and demand sides. It does not consider the climate risks to both the supply and demand sides of the Energy system in the country; as such, there is benefit in a climate mainstreaming effort of this Strategy document.

The Climate Change Office is supporting the Energy Ministry by examining how the energy supply system may be affected by predicted climate change impacts in order to improve its resilience in the medium to long term, as well as highlight changes to the characterization of energy demand due to climate-related factors. Some of the key climate change and climate variability risks to the energy transformation and distribution sectors are identified, as well demand-side concerns such as the desire for space cooling in public and private buildings that will accompany hotter summers and better socio-economic conditions, with the concomitant increase in energy consumption in the summer, and, inversely, decrease in the winter with a reduction in "cold days" and "cold nights". Identification of potential seasonal shifts in energy demand due directly or indirectly to climate change are part of the climate risk screening effort. The support to the Energy Ministry also includes the identification of policy, technical, market based or other recommendations to adapt to forecast climate changes which can be considered at a strategic level for the sector, or for integration in the strategy document in subsequent revisions. See Box 14, above, for a succinct summary of climate risks and adaptation opportunities identified for the Moldovan Energy sector.

Box 19 Climate Change and the Energy Sector Strategy for Moldova

## 6. Identification and Prioritization of Adaptation Measures

The shift from assessing impacts, risks, and vulnerabilities to identifying adaptation options can be challenging. Identifying options requires clarity around the problem statement and the decision context, while the design of adaptation options must be based on the understanding and prioritization of the impacts posed by climate change (see Boxes 11 and 12). At the same time, the context specific nature of adaptation options means that it is hard to draw generalizations from specific options in a given location.

The mainstreaming of climate change into Moldova's development strategies and its strategy documents requires the characterisation of the country's climate profile, the "mapping" of relevant climate change related institutions and stakeholders, and an assessment of risks from climate change impacts – present and forecast – to each sector. These aspects are either already prepared or in the process of development by the Climate Change Office. This information will support development of sectoral and national interventions. Adaptation options can be recommended to a Ministry or other relevant sector authority, including for integration in a revised strategy document. But how can the identified options or measures be assessed and prioritised?

The questions that must be answered are:

- What type of adaptation measures will be used;
- How will the Ministry define successful adaptation; and
- How will progress be measured?

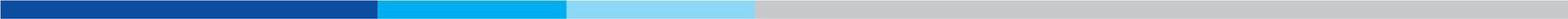
Steps for the implementation of adaptation initiatives
The function of prioritisation is highlighted in this list of the main tasks involved in proper design and implementation of adaptation initiatives.
Awareness raising for adaptation
Screening of possible adaptation options
Definition of suitable adaptation options
Analysis of defined adaptation options
<b>Appraisal and selection of adaptation options</b>
<b>Implementation of selected adaptation options</b>
<b>Monitoring and evaluation</b>

Box 20 Prioritisation of adaptation options in the context of the project cycle  
Source: Hammill and Tammer (2011) in GIZ: Economic Approaches for Assessing Climate Change Adaptation Options under Uncertainty

### 6.1 Selecting Appropriate Adaptation Options

While technical consultants play an important role in assessing climate risks, highlighting adaptation opportunities and even preparing recommendations on climate change adaptation options, it is the Planners of the Ministries that are usually responsible for identifying and prioritizing adaptation options.

The identification of adaptation options is often an iterative process. The selection of adaptation options, on the other hand, is frequently conducted through more formal decision-making processes. Selecting adaptation options is often about picking the best intervention to implement in the context of other competing claims to resources and priorities. Option evaluation and prioritization, therefore is about resolving the various trade-offs involved in decision-making and picking the options that will be the most successful in helping produce the intended outcomes and be sustainable over the long-term. This work is usually best done through a structured and transparent process aided by evidence.



A commonly used framework for classifying adaptation options places adaptive action into four main categories:

- **Retreat and relocate:** Involves accepting that pre-impact behaviour and activities no longer can be pursued, because they are too risky, too expensive or simply no longer possible. Adaptation involves switching to a different use strategy (e.g., from a process that uses water once to one that recycles water). Adaptation strategies that involve a change of location are a more extreme response. It may also involve accepting that some affected assets are not, or will not be, worth sustaining given the degree of climate risk they face and the alternatives that will need to be considered. An example might be a relocation of a port facility due to reduced water levels.
- **Accommodate and manage:** The aim of these adaptations is to prevent the consequences of climate change from occurring while allowing some pre-impact systems, behaviours and activities to continue, but with new measures introduced to reduce exposure. This approach is usually adopted where the assets at risk are sufficiently valuable to warrant some degree of protection. These measures most often involve the construction of structural works that will reduce the impacts of climate change. Dams and reservoirs that store water are common examples in this category. Revising design standards and policies to new conditions is another example.
- **Accepting losses:** This involves bearing losses and sharing losses. Loss bearing typically is an individual adaptation. However, it may be pursued by communities that have no other choices or where all the other choices to be too costly. Losses can be shared within wider communities (neighbours assisting each other) or via mechanisms, such as insurance and public relief.

- **Exploiting positive opportunities** ('win-win'). Involves introducing new activities, behaviours or practices to take advantage of new opportunities that climate changes bring about.

An example of the type of adaption options possible in the water sector can be seen in Box 21 below.

Once the decision has been made on the adaption measures to be used, there is a need to define the measure of successful adaptation and the pathways to achieve it.

Example of adaptation options for stakeholders in agricultural irrigation sector (Grand River basin, Ontario, Canada)

Stakeholder group	Sample adaptation options		
	Accepting losses	Accommodate and manage	Retreat and relocate
Irrigation farmers	Supplement income by seeking of-farm employment	Acquire additional rights to water	Switch from low- to high-efficiency irrigation systems
	Purchase additional crop insurance	Construct farm ponds and dugouts to store water (especially private irrigators)	Switch to crops that require less water
		Increase pumping capacity and relocate intakes (especially private irrigators)	
Irrigation districts	Contingency planning for water shortages	Upgrade canals and storage infrastructure to increase capacity and to reduce losses during transportation and storage	Adjust operation of district water control structures and water distribution systems (e.g., automation, system optimization)
		Relocate water intakes to accommodate changes in river channels	Promote efficiency and proper water use practices among water users
Federal government	Enhance crop insurance, stabilization, and relief programmes	Subsidize irrigation district infrastructure improvements	Promote research into new cultivars, new practices, new technologies
		Relocate diversion structures to accommodate changes in river channels	Adjust operation of provincial water control structures (e.g., automation, system optimization)
		Promote construction of farm ponds and dugouts (Prairie Farm)	Encourage shift from marginal lands to more productive lands
		Subsidize infrastructure improvements	

Box 21 Example adaptation options for stakeholders in agricultural irrigation sector, Grand River basin, Ontario. Source: de Loe et al. 2001. Adaptation options for the near term: climate change and the Canadian water sector. Global Environmental Change 11 (2001) 231-245

## 6.2 Prioritizing Adaptation Options

It is impossible for any country to undertake an in-depth analysis for the identification and the selection of each and every adaptation or mitigation option, in each sector. Prioritization is important because resources – such as finance, technical means, human resources and time – are scarce and must therefore be properly allocated. Technical methods that can be used in making decisions about selecting adaptation options often start from a suite of options and then help decision-makers prioritize the most efficient and effective adaptation option. Cost considerations can be a big concern; however, other criteria may be more important in a specific context. Some of these other criteria can include social and political acceptance, environmental impacts, legal and administrative requirements or technical feasibility.

The assessment and selection of the adaptation measures depends on their contribution to meeting certain objectives, on which a decision must be made. One of the most challenging points for achieving consensus is on the criteria to be used to assess the adaptation measures or options, and how important each of the criteria is in contrast with the others (weighting).

The process of determining the prioritization and selection of certain adaptation options over others should be transparent, and based on rationalized criteria. Ideally it is carried out and supported by a stakeholder group that can weigh in with considerations and concerns from different economic, social, cultural or political spheres. However, as with any participatory process, the wider the consultation and stakeholder engagement, the more time the process may take to achieve consensus.

A typical prioritization process relies on both quantities and qualitative assessment methods. Some of the typical criteria used are shown in Figure 4, while Box 22 provides the UNFCCC's recommended list of possible criteria for assessing adaptation options.

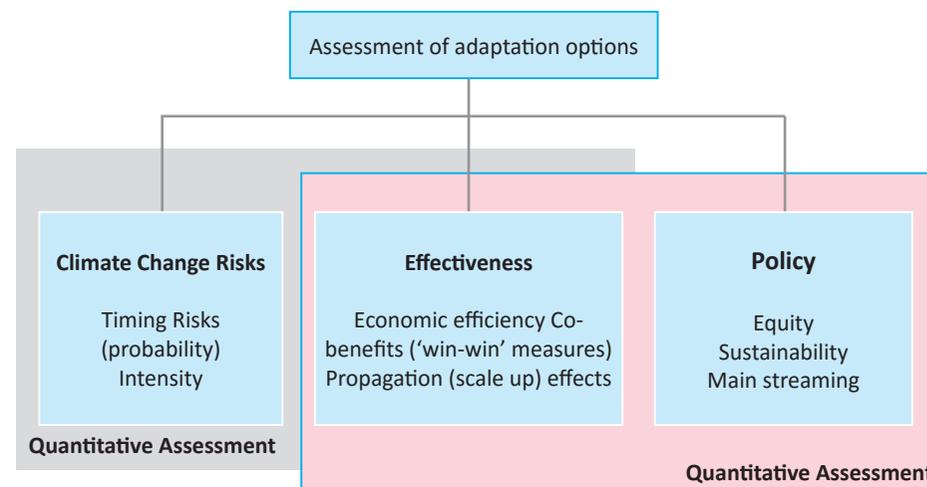


Figure 4 Key factors for climate exposure of land productivity sub-sector for the measure: Improve sustainable land management to enhance competitiveness in agricultural sector

### Possible criteria for assessing and prioritizing adaptation options

A non-exhaustive listing:

<b>Efficiency</b>	are the results optimized to the resources that were used?
<b>Effectiveness</b>	does the option achieve the objective?
<b>Equity</b>	does the option benefit vulnerable groups and communities?
<b>Urgency</b>	when does the option need to be implemented?
<b>Flexibility</b>	is the option flexible? Can it be adjusted and implemented incrementally, depending on the level and magnitude of climate change?
<b>Strength</b>	is the option strong in different projected climate change scenarios?
<b>Practicability</b>	can the option be implemented at different times? In a timely manner?
<b>Legitimacy</b>	is it politically, culturally and socially acceptable?
<b>Synergy / Coherence</b>	are there co-benefits? (for instance, improving management practices in agricultural land can also reduce erosion, and increase carbon sequestration, and capture nitrogen...)

Box 22 Criteria for assessing adaptation options

Source: UNFCCC Nairobi Framework: Assessing the Costs and Benefits of Adaptation Options: An Overview of Approaches

The purpose of the prioritization process is to clearly distinguish between the various adaptation options that are proposed in order to identify the ones that are most suitable to support the chosen approach.

The technical methods used to select adaptation options assess stakeholder-determined costs and benefits, based on financial and non-financial criteria, to categorize the adaptation options into:

- **No-Regret options** that do not incur major risks and provide high benefits; these should be immediately included and developed into implementable activities;
- **Low-Regret options** have high or medium costs or risks; and the benefits, even if potentially important, do not clearly outweigh costs. In such cases, additional in-depth analysis will be required to decide on their implementation;
- **High-Risk options** generate high risk and low or very low benefits. Through the screening process, the experts should clearly highlight what types of risks (i.e., institutional, financial, technical) these options induce. If the identified risks are high and the expected benefits (whether climate related or not) are low, the screening process should exclude these from any further consideration without any additional analysis.

The process of adaptation options analysis and the conversations it generates about trade-offs, preferences, and adaptation and resilience in general, are as important as the technical outputs from each method.

Some of the most common technical methods used to select adaptation options include cost-benefit analysis (CBA), cost effectiveness analysis (CEA) and multi-criteria analysis (MCA). Additional options include portfolio theory, real options analysis and trade-off analysis. The decision on which model is most applicable is illustrated in the following flowchart (Figure 5). Section 6.3 summarizes the most common methods in more detail.

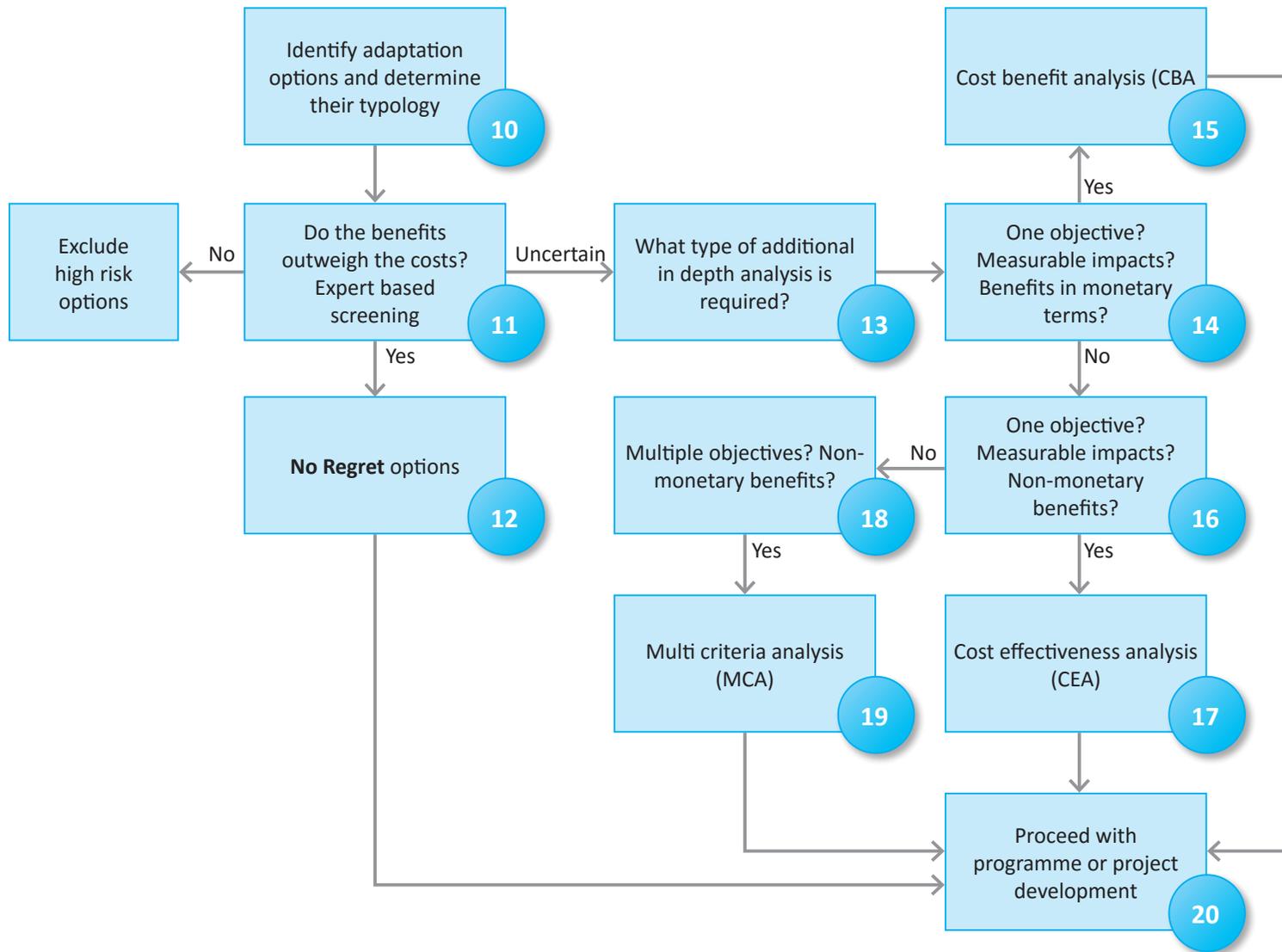


Figure 5 Climate screening flowchart (Part B): prioritization of adaptation options

## 6.3 Assessment Methods

The assessment methods discussed below are some of the most common technical methods used to select adaptation options and are widely used by planners to select between options in many different applications and contexts.

When the monetary values of costs and benefits are known for a particular adaptation option, tools such as CBA and CEA can be used to analyze and pick options. When monetary values are absent, when there are gaps in technical information, or when uncertainties are high and biases are strong, MCA provides a decision-making framework to sift through layers of complex information and make consistent and transparent decisions. Additional information on these methods is widely available, and some of the most widely distributed guides are listed below in Box 24.

These analyses should only be applied to measures that do not qualify under the “no-regret” umbrella or to measures where the benefits do not clearly outweigh costs. The decision on which model is most applicable is illustrated in Figure 5.

### Multi Criteria Analysis (MCA)

MCA techniques allow decision makers to establish preferences for specific policy options by referencing a set of already established objectives. There are multiple ways to conduct an MCA. The heart of an MCA is the creation of a “performance matrix” that allows for comparison of different options across chosen criteria. MCA can assess different options according to a specific set of disaggregated criteria, which can be attributed a particular weighting, for instance when one criterion is deemed to be more relevant or significant than another, such as health effects and environmental impacts, and potentially over different time horizons and future scenarios. The options are assessed according to the selected criteria, in a quantitative way, without requiring financial values.

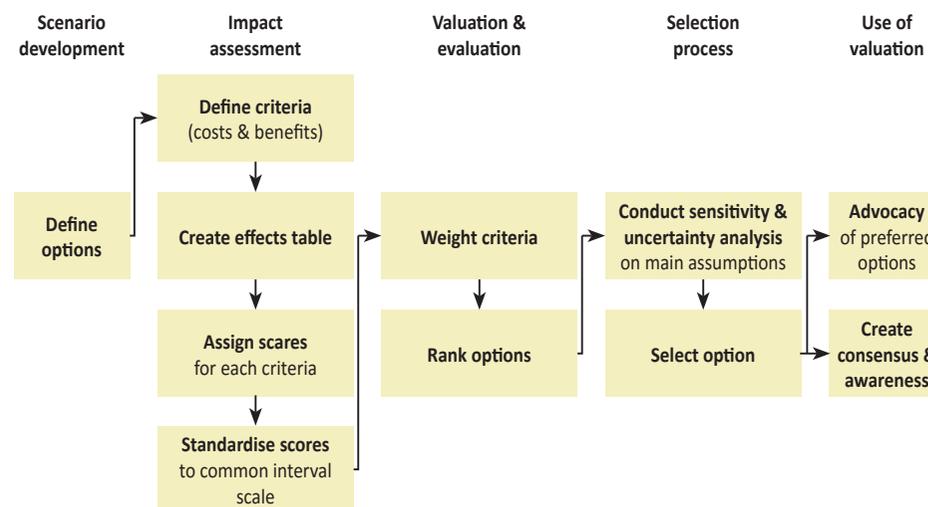


Figure 6 Phases in implementing a Multi Criteria Analysis process for selecting Adaptation Options<sup>3</sup>

MCA are the most widely used methodology for assessing and prioritizing options for climate change adaptation or enhancing resilience. The method was used during the creation of National Adaptation Plans of Action (NAPA). The UNFCCC called on all Least Developed Countries to create these plans and provided guidelines for tools to use while picking options<sup>4</sup>

An example of a criteria screen for conducting a MCA for adaptation options is shown in Box 23.

<sup>3</sup> <http://jncc.defra.gov.uk/page-4065#download>

<sup>4</sup> [http://unfccc.int/files/cooperation\\_and\\_support/lcd/application/pdf/annguide.pdf](http://unfccc.int/files/cooperation_and_support/lcd/application/pdf/annguide.pdf)

### Example of MCA criteria screen for assessing adaptation options

Criteria and Indicator	Rating
<b>Win-Win options:</b> Does the option address current climate variability and future climate change?	1 = Uncertainty; 2 = Based only on current; 3 = Both current and short-term (3 – 5 years); 4 = Medium- to long-term (more than 5 years)
<b>Existing risk management:</b> Is the option consistent with existing risk management activities	1 = No; 2 = Has short-term consistency (extreme event); 3 = Has long term consistency (average change); 4 = Both long- and short-term consistency
<b>Cost effectiveness:</b> Can the costs and benefits of the option be easily determined	1 = Very difficult; 2 = Difficult; 3 = Easy; 4 = Very easy
<b>Adaptive flexibility:</b> Does the option focus on a narrow range of future scenarios or allow flexibility of responses	1 = No, irreversible; 2 = Limited flexibility; 3 = Flexible; 4 = Very flexible
<b>Unintended impacts:</b> Are there potential negative spin-off impacts beyond targeted activities?	1 = Adverse impact; 2 = Uncertain; 3 = No impact; 4 = Beneficial impact
<b>Practical considerations:</b> Is the option practical and feasible for implementation	1 = Unfeasible; 2 = Problematic; 3 = Relatively simple; 4 = More easy
<b>Knowledge level:</b> How certain are we in predicting a particular change in a climate hazard and its impacts?	1 = Uncertainty (less than 10%); 2 = Low certainty (10 – 20%); 3 = Medium certainty (~50); 4 = High certainty (more than 80%);
<b>Policy coherence:</b> Does the option reflect national DRR or adaptation plans/studies?	1 = Only long-term or only medium-term need; 2 = long-term and medium-term need; 3 = short-term need; 4 = Both above all
<b>Emission reduction potential:</b> Does the option have technology potential for carbon removal and GHG emission reduction	1 = No; 2 = Low; 3 = Medium; 4 = High

Box 23 A criteria screen for conducting a MCA for assessing adaptation options

When the monetary value of an objective is clear, techniques such CBA and CEA can be used to pick from a list of identified adaptation options:

### Cost Benefit Analysis (CBA)

CBA compares the costs of implementing a particular option with its benefits and calculates the net benefits or efficacy (measured by net present value, the rate of return or the benefit-cost ration).<sup>5</sup>

Cost considerations are a critical element of public decision-making, and CBA tools can play an important role in decision making because they can put a monetary and easily understood value to specific adaptation actions.

CBA is usually used when the only criterion considered is the comparative efficiency of costs of the adaptation options of two or more options. This naturally requires knowledge of the economic value of both the costs and the benefits of the options.

Despite an increasing number of studies and case studies that analyze the costs and benefits of adaptation, it remains a difficult and complex exercise.

### Cost Effectiveness Analysis (CEA)

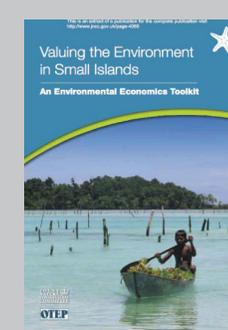
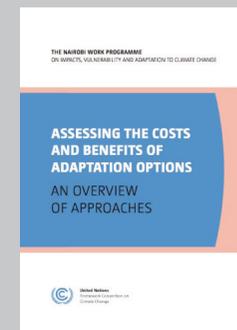
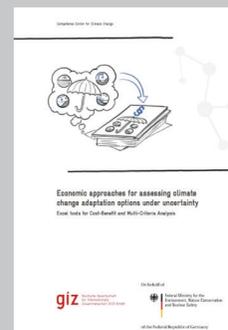
A CEA is typically employed when the objectives of a particular option are very clear but cannot be valued. CEA provides a tool to assess the most affordable method of achieving the objective.

“Cost Efficiency” – the key criterion of CBA, and “Cost Effectiveness” (CEA) are distinct concepts. For instance, a measure can be the most cost efficient to implement, but not be effective at achieving an objective.

In contrast, a measure can be effective, meaning it achieves a desired objective, but be so expensive to implement as to render it an irrational option.

<sup>5</sup> The net present value (NPV) is the difference between the present value of benefits and the present value of costs. An option can be acceptable if the NPV is greater than zero. Calculating the NPV of future costs and benefits requires the use of discount rates to determine the value of future benefits in the present. A benefit–cost ratio indicates the overall value for money of a project. If it is higher than one, a project is acceptable. Finally, the internal rate of return is the discount rate that makes NPV equal to zero. An option is more desirable if its internal rate of return is high.

## More detailed Guides on economic models for assessing climate change adaptation options



- **GIZ (2013)** Economic approaches for assessing climate change adaptation options under uncertainty: Excel tools for Cost-Benefit and Multi-Criteria Analysis <http://tinyurl.com/nhm9q9k>
- **UNFCCC** Assessing the Costs and Benefits of Adaptation Options: an Overview of Approaches ( a publication under The Nairobi Work Programme on Impacts, Vulnerability and Adaptation to Climate Change ) <http://tinyurl.com/o8hytmp>
- **Joint Nature Conservation Committee / OTEP (UK FCO)** (2007) Valuing the Environment in Small Islands – An Environmental Economics Toolkit <http://jncc.defra.gov.uk/page-4065>

Box 24 A criteria screen for conducting a MCA for assessing adaptation options

## Conclusions

Risk and opportunity screening and assessment is an integral part of mainstreaming climate change and variability in order to improve strategy documents such as national or regional Policies, Plans and Strategies, by ensuring that the strategic vision underlying the document is viable and realistic in light of future climate scenarios, and contributes to the resilience of the community, natural systems and the economy.

- Moldova's National Adaptation Planning Process project aims to develop capacities in the country, as well as a body of knowledge, in order to better plan for integrating climate change and variability into the strategic planning processes (Box 2).
- There are various sources of information and guides to the use of different climate screening and mainstreaming tools (Box 1).
- There are also various sources of information on present trends and future scenarios of climate change (Box 3).
- The overall objective of efforts to screen for climate risks and adaptation opportunities, and mainstream climate into strategy development documents, is to decrease vulnerability / increase resilience at the national level, by reducing sensitivity and improving adaptive capacity (Figure 1).
- Several methodologies and tools to organize and communicate climate risk screening analysis are identified and explained in section 3.
- Engaging and involving stakeholders in the climate mainstreaming process is essential to its success; not only are stakeholders informed and participative, they may also contribute with valuable data, knowledge and perspectives which can help identify and shape adaptation solutions (section 4).
- Strategy documents, including Plans and Policies, can be revised to include recommendations for mainstreaming climate change considerations; this can be done in an active way by an implementation team as part of a participative stakeholder engagement, or a more passive way, by the institutional "owners" of the documents with recommendations by the Implementation team (section 5).

- In a context of limited resources (capital, technical means, time, etc.), it is important to short-list then prioritise those adaptation or resilience measures that are deemed to be most effective or efficient; there are different methodologies for this, though the most usual is the Multi Criteria Analysis (section 6).



Climate mainstreaming is a pluri-disciplinary, engaging process. Screening and assessing the main risks from climate change and variability, but also the potential opportunities for adaptation measures which improve resilience, is an important initial step.

Photo of participants developing group work at the ADA/UNDP Seminar and Workshop on Screening for Climate Change Risks and Opportunities in Moldova's Planning, 2014.

This Guide can be freely distributed and downloaded from:  
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