

# *Guidelines for the elaboration of municipal climate change adapted strategies*

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Proiect "Calea Verde spre Dezvoltare Durabilă"  
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## ***Guidelines for the elaboration of municipal climate change adapted strategies***

Activity	2.2.1. Elaboration of 5 guidelines for adaptation to climate changes in the Region 7 Centre, as follows: 1 guidelines for the elaboration of municipal strategies, and 4 guidelines for the selected vulnerable sectors: transportation, energy, infrastructure/constructions/urban planning, ecosystem.
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### **ABBREVIATIONS**

MMAP	Ministry of Environment, Waters and Forests
APM SB	Sibiu Environmental Protection Agency
KS	The Norwegian Association of Local and Regional Authorities
ULBS	Lucian Blaga University at Sibiu
ANM	NATIONAL METEOROLOGICAL ADMINISTRATION

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**Glossary**

<b>Concept</b>	<b>Presentation</b>
<b>Adaptation</b>	Includes any initiatives or actions in response to real or forecasted impact of climate changes, aimed at reducing the climate change impact on built-on, natural and social systems, and at exploiting the benefits. Several adaptation types can be distinguished: anticipatory, autonomous or planned.
<b>Mitigation</b>	Promotion of policy, legislative and project measures that contribute to stabilizing or reducing the concentrations of greenhouse gases in the atmosphere. Programs for renewable energy, energy efficiency and fossil fuels substitution are examples of measures to mitigate climate change
<b>Adaptation capacity</b>	The ability of a system to adapt to climate change (including climate variability and extremes) to reduce the potential damage, to take advantage of opportunities or to face the consequences
<b>Extreme events</b>	Refers to extreme weather conditions that rarely occur in a particular place and / or time as an intense storm or a heat wave above the normal activity limits. They can result from sudden and drastic changes in temperature, rainfall or gradual but prolonged changes in temperature, precipitation than normal. Such events include storms, frozen rain, heat waves, floods, droughts, fires, etc.
<b>Impact</b>	Effects of current or forecasted climate change on built, natural and social systems. It can distinguish between potential impact (following expected climate change, without considering the adaptation), and residual impact (climate change impact that could occur after adaptation)
<b>Probability</b>	The possible occurrence of an event or results, provided that this can be estimated probabilistically
<b>Resilience</b>	The ability of a system, community or society exposed to hazards, to adapt, through resistance or changes, in order to preserve the same structure and operations, the self - organization capacity
<b>Risk</b>	The risk can be considered as a combination of an event likely to occur and its impact - risk equals the probability of climate hazard multiplied by the impact of that event
<b>Climate change</b>	Any statistically significant variation of either average climate status or its variability, that persists for an extended period of time (decades). Climate change may be due to natural variability, i.e. atmospheric composition changes, or human action, i.e. land use.
<b>Sensitivity</b>	The degree to which a particular system is directly or indirectly affected (negatively or positively) by climate conditions (e.g. temperature rise) or specific impacts of climate change (e.g. increased flooding).
<b>Vulnerability</b>	The degree to which a system is prone to, or unable to cope with the adverse effects of climate change, including the climate variability and extreme events. The vulnerability is a function of sensitivity and adaptation capacity of a particular sector.

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## Introduction

### Rationale for the guidelines elaboration

This document was produced under The Greenway to Sustainable Development project financed from funds provided by Iceland, Liechtenstein and Norway through the European Economic Area Financial Mechanism 2009-2014 EEA, on the RO07 Adaptation to climate change. The project promoter is the Environmental Protection Agency from Sibiu, and its partners, the Norwegian Association of Local and Regional Authorities - KS, the National Meteorological Administration, Municipality of Sibiu, Brasov City Hall, Tg. Mures City Hall, and "Lucian Blaga" University of Sibiu. The project was implemented between January 2015 and April 2017. The overall objective is to reduce human and ecosystem vulnerability to climate change and aims to develop a set of best practices on adaptation to climate change.

Climate change is already a real part of our planet's life, the negative effects being of both economic and social nature. Constrained by the scale of these phenomena, especially the dangers more or less visible they incur, world leaders pledged global negotiations to set out the obligations of each country in order to reduce the overall impact of climate change. As a Member State of the European Union, Romania was involved responsibly in this international effort. By nature of its operations, the Ministry of Environment and Climate Change, which plays an important role in fulfilling the undertaken obligations, developed the National Strategy on Climate Change, a document that provides support, vision and benchmarks for future real actions.

### Importance/utility of Guidelines

This Guide mainly addresses the local public authorities, being useful to any municipality in the country, as it is a model of good practices in the elaboration of local strategies adapted to climate change. The main goal is to disseminate the current knowledge of adaptation to climate change, especially to decision-makers (authorities, public institutions and regional and local environmental, development, public works and urban planning agencies) due to its information and educational nature.

#### Role of strategies and action plans on adaptation to climate change

Coherent and structured documents for local government, but also for all those interested to get involved in climate change adaptation

To increase the economic, technical and social capacity of municipalities and cities to adapt to climate change

To contribute to the achievement of environmental and regional objectives through direct involvement of regional and local authorities and relevant research institutions

To support the improvement of community involvement in making decisions on

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adaptation to climate changes

To contribute to the decrease of social and ecosystem vulnerability

To provide the grounds for identifying and implementing adapted solutions in the following sectors: agriculture, forestry, water resources, biodiversity, energy, industry, transportation, tourism and leisure, public health, infrastructure and urban planning, insurance, education, information and awareness

To contribute to a better understanding of the impact of climate change and variability, by analysing the specific adaptation needs for these sectors

Play a major information and educational role for both citizens and decision makers

To contribute consistently to strengthening the knowledge in order to support the development of policies on climate change, improved resilience and adaptation to it; to improve the understanding of climate change impact at sectorial and inter-sectorial levels; to develop the economic and social integration and development processes

To provide the necessary information for updating local strategic plans by including the adaptation measures

The methodology presented in the Guide comes to bring a common framework for all cities in Romania, based on the methods and tools successfully used at European and global level, thus facilitating the exchange of experience between cities and identification of projects of common interest.

## 1. Summary of the Guide proposed methodology

This chapter presents the methodology proposed for carrying-out the production of strategies and action plans on adaptation to climate change, and the following chapters and sub-chapters detail the necessary stages and steps for the elaboration and implementation of these documents, as well as various methods and tools to be used.

To summarize, the elaboration and implementation of a Strategy on adaptation to climate change, including the Action Plan, consists in:

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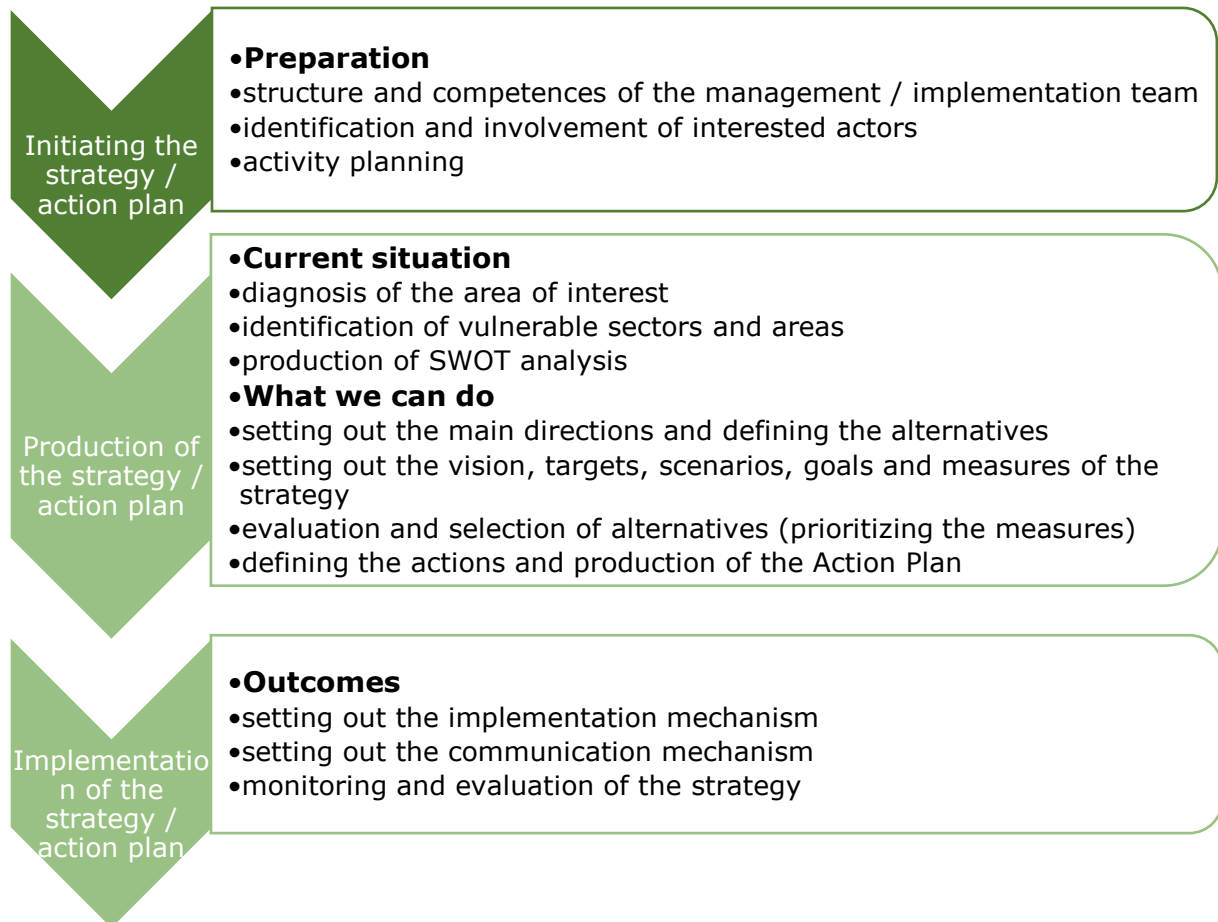
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As presented in the above figure, this process includes three major phases that come to answer some important questions: How we prepare?, Where we are?, What can we do?, and Did we achieve what we wanted?, and several steps summarized below:

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Stage 1. Structure and  
competences of the  
management /  
implementation team

- setting out the process management team considering the required competences
- clarification of institutional and administrative aspects

Stage 2. Identification and  
involvement of interested  
actors

- identification of stakeholders
- building partnerships
- setting out the work method for partners

Stage 3. Activity planning

- inventory of resources available
- defining the work methodology and tools
- design of activities

Stage 4. Diagnosis of the  
area of interest

- review of the existing relevant documents
- identifying the key information and relevant indicators
- data collection and analysis

Stage 5. Identifying the  
vulnerable sectors and  
areas

- analysis and prioritization of sectors
- selection of vulnerable sectors

Stage 6. Production of  
SWOT analysis

- analysis of internal environment (strengths and weaknesses)
- analysis of external environment (opportunities and threats)

Stage 7. Setting out the  
main directions and  
alternatives

- setting out the main directions of the strategy
- defining the alternatives using various tools: SWOT analysis, problem and objective trees, fishbone diagram

Stage 8. Setting out the  
vision, targets, scenarios,  
goals and measures of the  
strategy

- defining the vision
- identifying the sector objectives and targets to be reached throughout the strategy implementation
- defining the measures

Stage 9. Evaluation and  
selection of alternatives

- setting out the criteria
- prioritization of measures

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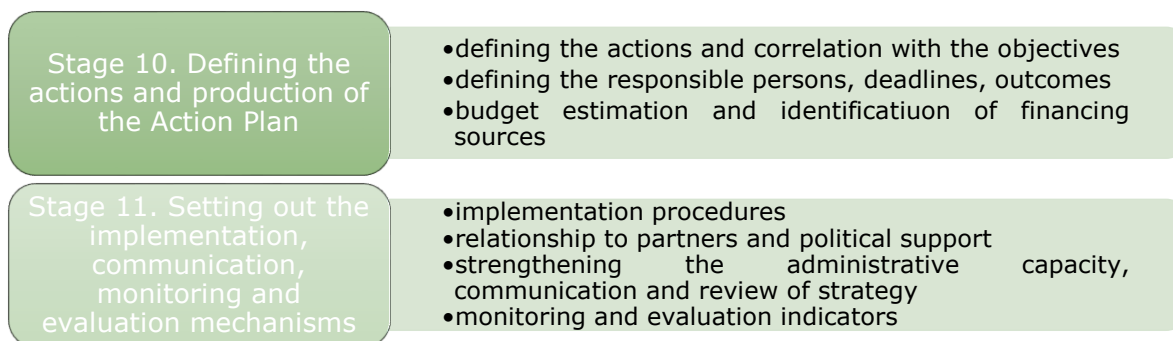


Figure 1. Examples of phases and stages of adapted strategies production:

<p>Norway, <a href="https://www.regjeringen.no/en/dokumenter/meld.-st.-33-20122013/id725930/">https://www.regjeringen.no/en/dokumenter/meld.-st.-33-20122013/id725930/</a>, White book - Climate change adaptation in Norway</p>	
<p><b>1. Raising the awareness/ motivation / understanding level</b></p>	<p>Is it necessary to prepare for climate change? Why? What is the objective? Is there a common understanding / motivation? Where can we get additional information from? Are the internal and external measures necessary for disseminating information?</p>
<p><b>2. Evaluation/ analysis of vulnerability against the current climate and climate impact. Are there any municipal plans to combat this impact?</b></p>	<p>Temperatures Snowfall Annual precipitation Short extreme / heavy rainfall Heat waves Drought Water level Wind</p>
<p><b>3. Evaluation/ analysis of vulnerability against the future climate and impact</b> <b>4. Identification / analysis/ evaluation of measures to combat the vulnerability to the forecasted climate and its impact</b></p>	<p>Increasing temperature Reduced annual precipitation / Increased precipitation intensity More frequent and intense heat waves Decreasing snow level Decreasing water level during drought / Increasing water level during extreme precipitation More frequent and intense droughts Stronger winds</p>
<p><b>5. Prioritizing the measures to combat the</b></p>	<p>Land use planning Planning and management of infrastructures Planning and management of buildings</p>

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<p><b>vulnerability to the forecasted climate</b></p> <p><b>6. Implementation</b></p> <p><b>7. Monitoring, control and plan updates</b></p>	<p>Biodiversity and habitats</p> <p>Health</p> <p>Planning of emergency situations (e.g. fire stations)</p> <p>Industrial policy</p>
<p><b>Austria, <a href="http://www.klimawandelanpassung.at/ms/klimawandelanpassung/en/">http://www.klimawandelanpassung.at/ms/klimawandelanpassung/en/</a>, <i>Methods and Tools for Adaptation to Climate Change. A Handbook for Provinces, Regions and Cities</i></b></p>	
<p><b>8. Design of an adaptation framework</b></p>	<p>Adaptation needs</p> <p>Coordination team</p> <p>Mitigation and adaptation to climate change</p> <p>Political framework for adaptation</p> <p>Economic aspects of climate change</p> <p>Extreme event costs</p> <p>Climate change</p> <p>Climate change impact</p> <p>Critical points of climate change</p> <p>Climate change in urban areas</p> <p>Climate change at global level</p> <p>Social aspects of climate change</p> <p>Literature and information platforms</p> <p>Projects and research institutions</p> <p>Glossary</p> <p>Examples of best practices in adaptation</p> <p>Survey on the current situation in terms of adaptation</p> <p>Selection, analysis and integration of stakeholders</p>
<p><b>9. Identifying risks and finding solutions</b></p>	<p>Inventory: current situation and climate issues</p> <p>Current social, economic and ecological situation</p> <p>SWOT analysis</p> <p>Climate change effects</p> <p>Measures of adaptation to climate change</p> <p>Prioritization criteria</p> <p>Tools in place</p> <p>Presentation of political tools</p> <p>Strategy and action plan</p>
<p><b>10. Implementation and monitoring</b></p>	<p>Recommendations for successful implementation</p> <p>Adaptation process steps</p> <p>Monitoring and evaluation of adaptation measures</p> <p>Questionnaire on the implementation status</p> <p>Communication principles</p> <p>Examples of communication on climate change and adaptation</p>
<p><b>Netherlands, <a href="http://www.ruimtelijkeadaptatie.nl/en/">http://www.ruimtelijkeadaptatie.nl/en/</a>, <i>Guide to spatial adaptation</i></b></p>	
<p><b>1. Analysis – vulnerabilities and opportunities</b></p>	<p>Which are the climate changes in the target area?</p> <p>How do floods, extreme precipitation, drought, and heat waves affect the envisaged area?</p>

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	<p>What are the vulnerable functions of the area and how vulnerable are the people working and living in this area? If we want to take actions, are there any opportunities that help us reduce costs, contribute to a better environment or to create added value?</p>
<b>2. Ambition – objectives &amp; challenges and strategies</b>	<p>Establishing one or more specific objectives to be supported by partners. The objectives are in line with the vision established for this territory Determining how these objectives can be achieved: How can we implement the tasks arising from the objectives set? What measures would be most effective? What we can do by ourselves and where do we need stakeholders? When do we want to see the results?</p>
<b>3. Action –political accountability and implementation</b>	<p>Development of policies and regulations on adaptation. Maybe there is a policy or a program of adaptation in place or adaptation can be incorporated into various sectoral policies The implementation of the adaptation process refers to the use of conventional management, maintenance and rehabilitation processes</p>
<p><b>Spain, <a href="http://www.adaptecca.es">http://www.adaptecca.es</a>, <i>Guia para la elaboracion de programas municipales de adaptation al cambio climatico</i></b></p>	
<b>1. Integrating the adaptation to climate change into the local Action Plan</b>	<p>Identifying the climate change risks Identifying the priority action areas of the municipality Adjustment to adaptation of the objectives and actions existing in the local Action Plan</p>
<b>2. Producing a municipal program on adaptation to climate change</b>	<p>Building a mechanism for internal process coordination Identifying the potential risks of climate change Identifying the major risks and priority action areas of the municipality Setting out the adaptation objectives Defining the adaptation actions Creating a monitoring and evaluation system Program updates and review Communication and contribution throughout the process</p>

## 2. Details of the process stages

The drafting and implementation of the strategy and action plan on adaptation to climate change relies on the planning, decision-making through a partnership between local government and relevant actors from the city, to set out the objectives and actions to be undertaken in the future, based on the existing resources and conditions. Basically, this partnership identifies the ways for actions aimed at improving the situation and more effective allocation of resources to achieve the objectives set.

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## 2.1 Initiating the strategy/action plan

This first phase is dedicated to creating the necessary framework for developing and implementing the strategy and action plan on climate change at the city level (steps 1-3).

### 2.1.1 Structure and competences of the management/implementation team

Local government's role is to initiate, coordinate and maintain the process of developing and implementing the strategy on adaptation to climate change. Also, this team must ensure that this process will involve relevant actors and stakeholders in the city. Thus, the local government will form a management / coordination team and will allocate the necessary resources (staff, time, money) for the fulfilment of the activities defined for the achievement of goals. This team should be composed of people with skills and knowledge needed for this process, which may be changed during the process, if it requires additional skills. The team will include both managers, especially for the decision-making stages of the process, and executive staff, which ensures the proper production of documents. This team will be the "engine" of the process that ensures the smooth running of it.

The figure below presents a minimal structure of the members and tasks of the management / coordination team:

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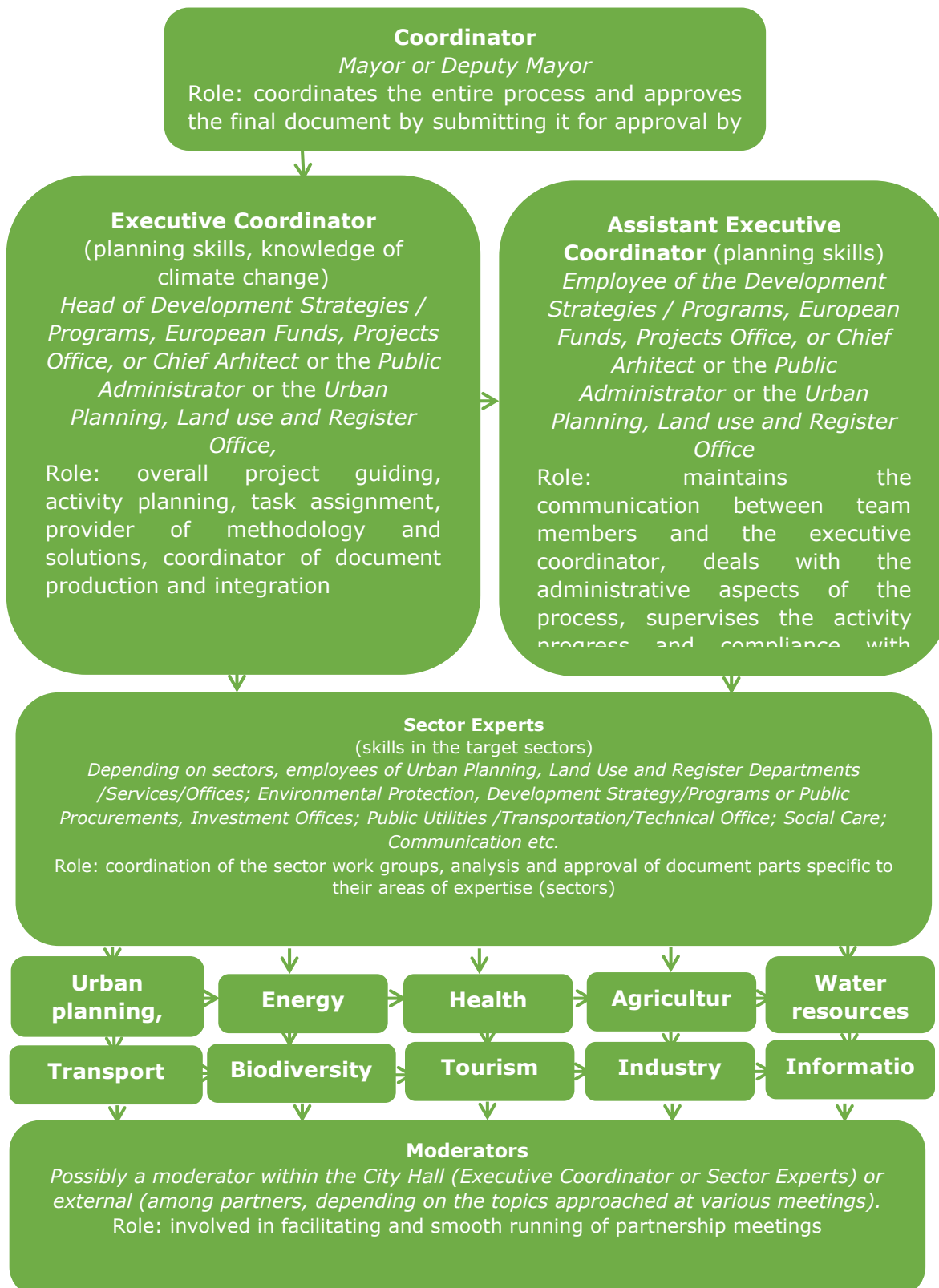
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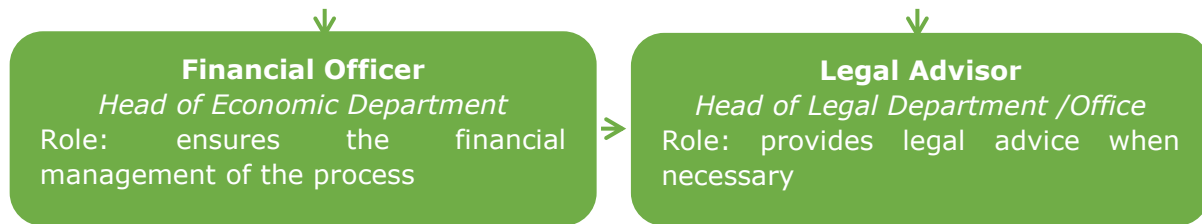


Table 2. Example of Local Government Departments involved in the elaboration and implementation of a strategy on adaptation to climate change

### Strategy on adaptation to climate change, Malmo City, Sweden

**City Hall**  
**Real Estate Office**  
**Social Resources Department**  
**Internal Service Department**  
**Environmental Department**  
**Water and Wastewater Authority of the City**  
**Urban Planning Office**  
**City Street and Park Department**  
**Neighborhood Offices**  
**City Council**

## 2.1.2 Identification and involvement of stakeholders

As mentioned above, one of the success factors in developing the strategy and plan of action on adaptation to climate change is to involve the relevant actors / stakeholders at local level and beyond, in the process, in order to consider their interests, problems, and visions. This step is particularly critical to ensure the ownership and successful implementation of strategic documents. This stage identifies the stakeholders, builds partnerships (management / coordination, advisory, executive, monitoring and control, general or sectoral working groups), and determines how to work with partners. The establishment of partnership networks, as well as the exchange of ideas and experience, lead to the development of better documents, more practical and the success of implementation.

The identification of such stakeholders must consider the ones acting in the public sector, at local and national level, from business, labor, non-governmental and community organizations, political parties, media, the general public. There are two types of stakeholders: primary (those who are directly affected by the proposed strategy and actions), and secondary (the mediators in developing and implementing strategic documents). The chart below presents the main categories of stakeholders at local level:

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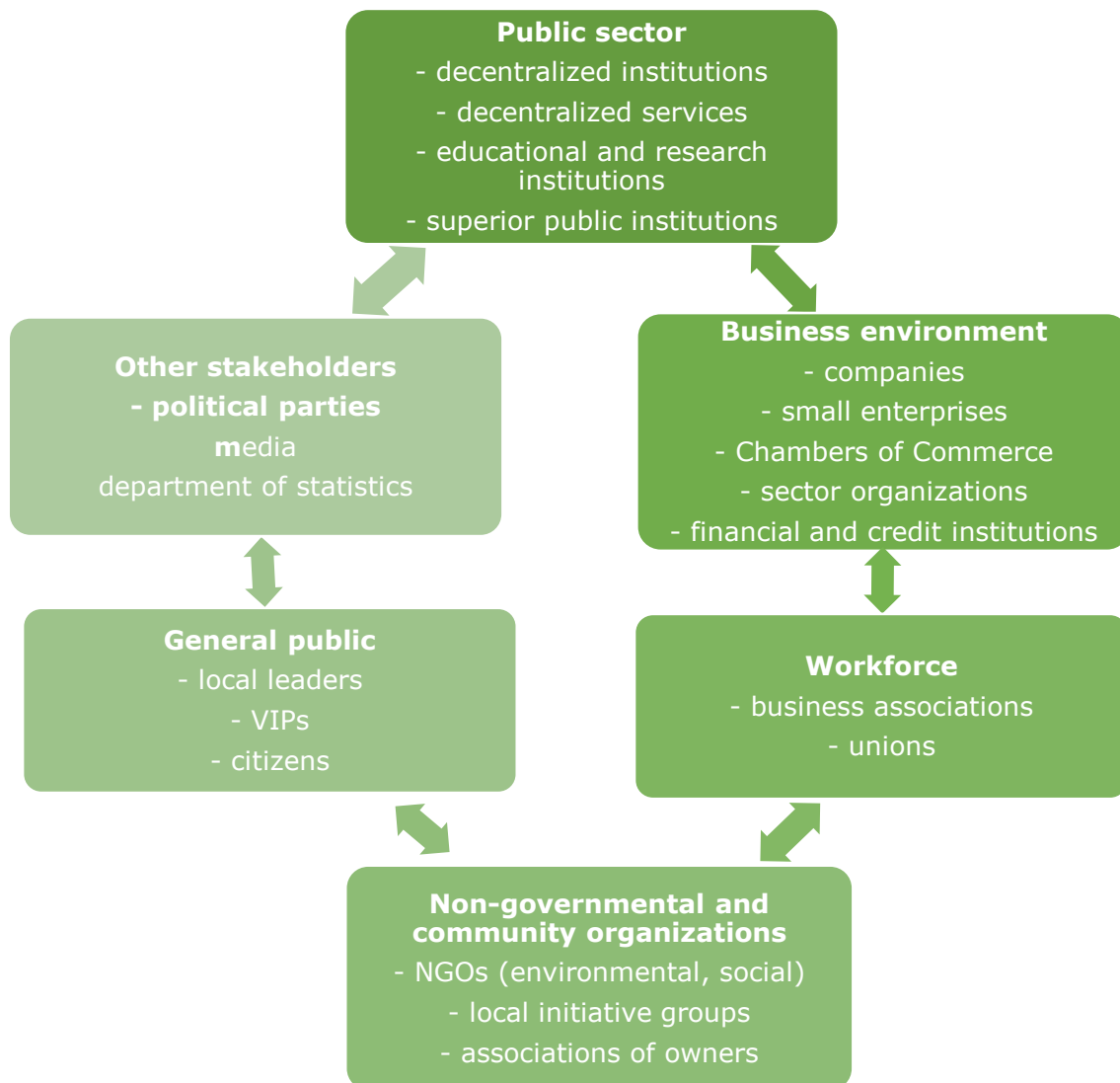


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The group of identified stakeholders may start from a small number (e.g. one for each category), and, following the discussions with them, the list may be extended.

The final list of stakeholders must consider:

- The importance – how important is the partner to the process
- Influence – the partner’s power to influence the process
- The interests for which partners get involved in the strategy elaboration and the implementation of the action plan, i.e. how the strategy meets their priorities.

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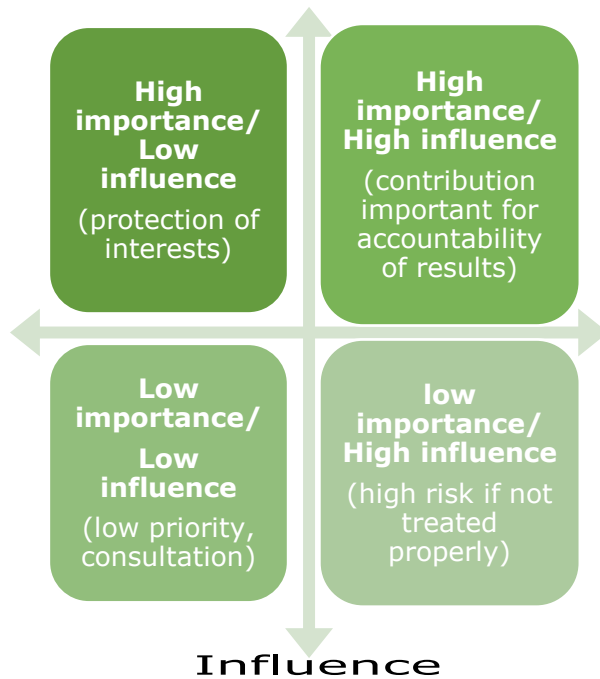
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For these purposes, two instruments can be used, as follows:

The importance / influence matrix

and

The matrix of interests



Stakeholders	Field of analysis			
	Field 1	Field 2	Field ...	Field n
Stakeholder 1				
Stakeholder 2				
Stakeholder ...				
Stakeholder n				

Minimal interest	
Average interest	
High interest	

The analysis of these matrices maximizes the involvement of partners that can support the elaboration and implementation of documents and reduces the reaction of those who might block this process.

Once determined the partnership size, it can become official to start building the partnership network, i.e. decision will be made on the partners' contribution by stage and activity, depending on their expertise and required skills.

The partnership structures to be created may have various purposes:

- information – bidirectional, i.e. information by the initiators on the stages fulfilled and the main results (addressing all stakeholders), and data collection for the elaboration of documents (addressing those who possess such information, according to the field of analysis)
- consultation – collection of opinions, observations, supplements to the documents, during various process stages (e.g. for analysis, alternatives or actions); consultations can be made in various forms: face-to-face, via internet (e-mail, forums, websites of institutions, social media), by telephone
- active involvement and cooperation – direct work with the stakeholders during each stage, including the actual production of documents and decision-making
- implementation (including monitoring and control) – stakeholders are actively involved in the implementation of the strategy and action plan and the monitoring of their fulfilment.

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A partnership structure might include the following groups:

- decision-making – **City Council** – approves the final documents and establishes the conditions for their implementation
- coordination – **Management / coordination team** formed within the City Hall (see the description in section 2.1.1) – is involved in all stages and coordinates all activities, proposes methodologies and tools, conducts assessments and provides input throughout the process, integrates the documents produced by the sector work groups, ensures the communication between all partners involved in the process, the dissemination of knowledge required and project results, and drafts the City Council Decision on the approval of final documents. Also, the coordination team will play an active role in the implementation of these documents
- consultation – **Consultation Committee** – consists of the decision makers in the different institutions and bodies from the city, the representatives of economic, social, educational environment, including the civil society, that will be consulted regularly on the content of documents and results achieved at each stage, and formulates recommendations and proposals related to the content of the materials presented
- executive – **Sector work groups** – consisting of experts in the target fields (the proposed sectors are specified in section 2.1.1), will collect and analyze the quantitative and qualitative data, elaborate the sector analysis, will identify and prioritize the major risks of that sector, set the objectives, assess and select the alternatives, and identify the priority interventions in the target sector, under the action plan. Sector groups will conduct activities both independently and in collaboration with other groups, so as to ensure the integration of objectives, priority interventions and actions required for implementation at city level
- implementation – the partners who have been identified as in charge with the implementation of activities under the Action Plan will ensure the implementation of the strategy, and the **Monitoring Committee** – formed by the members of the coordination team, consultation committee and sector work groups, will follow up the implementation of the actions set out in the action plan, quantify the degree of achievement of objectives, identify the implementation issues and find solutions to them.

Each partnership group should clearly establish the following aspect from the very beginning: the resources allocated to the partners (people, money, information, time), the activities undertaken, people in charge, the envisaged results and deadlines, the communication mechanisms and frequency of meetings, and the decision-making mechanisms (including the internal rules of the group, depending on the tasks assigned in the process).

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Table 3. Example of partners involved in the elaboration of the strategy and action plan on adaptation to climate change in Tg. Mureș Municipality

Tîrgu Mureș City Hall	
Mureș Water Basin Administration – Water Management System, Mureș	Local Construction Inspectorate - Centre
Tîrgu Mureș International Airport	Mureș Prefect’s Office
Mureș Environmental Protection Agency	Romanian Order of Architects – Mureș Branch
Sibiu Environmental Protection Agency	Ministry of Environment, Waters and Forests
National Agency for Land Improvement – Branch: Mureș – Oltul Superior – Mureș Management Unit	RCS&RDS SA Romania
National Environment Agency	Brașov Regional Railway Authority
Valea Soarelui Association	Romanian Register of Urban Planners – Cluj Office
PRO BICICLO URBO Environmental and Nature Protection Association	SC AQUASERV SA
National Authority for Communication Management and Regulation (ANCOM)	SC E.ON Gaz Distribuție SA
Teacher Training Center	SC Proiect SRL
Mureș County Council	SC Silentia Impex SRL
Public Health Authority	SC Transport Local SA
Mureș Forestry Authority	Mureș Department of National Roads
FDEE Electrica Distribuție Transilvania Sud SA	TELEKOM Romania
Focus Eco Center	Tîrgu Mureș University of Culture & Sciences
Mureș Emergency Inspectorate	“Petru Maior” University, Tîrgu Mureș
Mureș County School Inspectorate	“Lucian Blaga” University, Sibiu

### 2.1.3 Activity planning

This stage identifies the objectives envisaged by the strategy and action plan development (the main objective is the preparation of these documents, see examples of other objectives in table 4), the available resources (people, money, time, information), the work methodology and tools, and clarifies the institutional and administrative issues.

Table 4. Examples of goals set during the elaboration of the climate change adapted strategy

Vancouver, Canada
To increase the resilience of the city's infrastructure, programs and services to the anticipated impact of climate change

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To promote and facilitate the integration of information on climate change in the City Hall’s activities

To improve the awareness, knowledge, skills and resources of the City Hall’s personnel

To raise the coordination and cooperation opportunities by building partnership networks

**Melbourne, Australia**

To reduce the probability and effects of risks or to raise the control over them

The activities to be undertaken during the development, the timelines, tasks leaders, by ensuring the correlation and clear delineation between the start activities, coordination and maintenance of the process run by the local authority, and the executive and consultation activities undertaken by partners will also be set. Activity planning can be done using the GANTT chart:

Activities	Result	Task Leader	Month 1				Month 2				Month n			
			S1	S2	S3	S4	S1	S2	S3	S4	S1	S2	S3	S4
A1														
A2														
A3														
A4														
Year														

The elaboration of an adapted strategy on climate change can take between 1 and 2 years, and activities must be correlated to the steps 4-11 below (as presented and summarized in the diagram on the steps needed to be followed for developing the strategy and action plan in Chapter 1), the latter activity being the approval of the final document by the Local Council. The implementation period of the Strategy and Action Plan depends on the period for which those documents are drawn up, and the activities mainly aim at fulfilling the projects and actions identified in the Action Plan, communication, monitoring & evaluation and updating.

## 2.2 Elaboration of the strategy/action plan

### 2.2.1 Recommendations for the diagnosis of the target area

The diagnosis refers to the analysis of weather events that have affected the city / town and other studies already drawn for Risk Assessment – the trend of relevant climatic variables (temperature, precipitation as rainfall, snow, hot days, storms etc.). This stage seeks to find answers to the following question: **Does the municipality / city actually face climate change-related phenomena?**

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*Climate context:*

*The urban heat island (UHI) is a phenomenon which manifests itself by concentrating higher temperatures in densely populated and built-up urban areas, compared with the surrounding rural areas*

The literature presents two complementary methods for detecting urban heat islands:

- ✓ detecting the UHI through direct measurements made at 1.5 m height from ground level to determine the air temperature variations in the layer of breathable air (atmospheric urban heat island - AUHI); direct measurements are carried out under a clear sky, calm atmospheric conditions, high pressure, city cross sections, and fixed points (the central area, the extra urban – benchmarks to determine the deviations, urban area with tall and medium height buildings, green area and industrial area).
- ✓ detecting the area urban heat island through surface temperature readings (ICUs) using remote sensing instruments, based on satellite images; this type of analysis does not provide information on air temperature at a constant level as in the previous case, but the temperature of any surface, regardless of the level at which it is situated (on the ground, the canopy of trees, the roofs made of various materials etc.). It can make a comparison of the UHI for a period of 29 years (1989-2016)

The variability and evolution trend of extreme heat and rainfalls started to be measured in 1961. It is proposed the detection and temporal analysis of 30 indicators compiled using extreme temperatures (19) and extreme rainfall (11) recorded at the Meteorological Station:

1. Summer days (SU25):  $T_{max} \geq 25 \text{ }^\circ\text{C}$
2. Tropical days (TD30):  $T_{max} \geq 30 \text{ }^\circ\text{C}$
3. Frost days (ID0):  $T_{max} \leq 0 \text{ }^\circ\text{C}$
- 4-6. Annual mean ( $T_{xmean}$ ), minimum ( $T_{Xn}$ ) and maximum ( $T_{Xx}$ ) values of maximum temperatures;
7. Warm days ( $TX90p$ ): percentage of days when  $T_{max} > 90^{th}$  percentile of that day temperature;
8. Chilly days ( $TX10p$ ): percentage of days when  $T_{max} < 10^{th}$  percentile of that day temperature;
9. Warm spell period duration index (WSPI): the annual count of minimum 6 consecutive days when  $TX > 90^{th}$  percentile of temperature value.
10. Tropical nights (TR20):  $T_{min} \geq 20 \text{ }^\circ\text{C}$ ;
11. Very cold nights (FN-10):  $T_{min} \leq -10 \text{ }^\circ\text{C}$ ;
- 12-14. Annual mean ( $T_{nmean}$ ), minimum ( $T_{Nn}$ ) and maximum ( $T_{Nx}$ ) values of minimum temperatures;
15. Warm nights ( $TN90p$ ): percentage of days when  $T_{min} > 90^{th}$  percentile of temperature value;

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16. *Chilly nights (TN10p): percentage of days when  $T_{min} < 10^{th}$  percentile of temperature value;*
17. *Cold spell duration index (CSDI): the annual count of minimum 6 consecutive days when  $TN < 10^{th}$  percentile of temperature value.*
18. *Diurnal temperature range (DTR): the variation between the highest day temperature and the lowest one;*
19. *Growth spell duration (GSL): annual count of days between the first minimum 6 consecutive days with mean temperatures (calculated as the mean of maximum and minimum temperature/day) above 5 °C, and the first period, after July 1<sup>st</sup>, of minimum 6 consecutive days with mean temperatures below 5 °C.*
20. *Heavy-rain days (R10): daily rainfall amount  $\geq 10.0$  mm;*
21. *Heavy-precipitation days (R20): daily precipitation amount  $\geq 20.0$  mm;*
22. *Heavy-precipitation days (R25): daily precipitation amount  $\geq 25.0$  mm;*
23. *Number of consecutive dry days (CDD): daily amount  $< 1.0$  mm;*
24. *Number of consecutive wet days (CWD): daily amount  $\geq 1.0$  mm*
25. *Extremely wet days (R95p) – total annual precipitation amount of days when the amount exceeded the 95<sup>th</sup> percentile of the daily value;*
26. *Extremely wet days (R99p) - total annual precipitation amount of days when the amount exceeded the 99<sup>th</sup> percentile of the daily value.*
27. *Total maximum precipitation over 24 h (Rx1day);*
28. *Total maximum precipitation over 5 days (Rx5days);*
29. *Simple day intensity index: annual precipitation amount divided to the number of wet days (SDII);*
30. *Total precipitation amount during wet days over 1 year (PRCPT)*

Step two consists of carrying out the analysis and assessment of risks and vulnerabilities to climate change. Given that the previous step found that the target area is affected by phenomena associated with climate change, the question to be answered to is: **What are the actual effects of climate change on these communities by sectors?**

This step involves an assessment of all relevant socio-economic factors and relies on the official statistics published by the National Statistics Institute, and the statistics provided by partners, or other information found in the existing studies (environmental reports, local risk management plans, GUPs, CEAPs, SEAPs, etc.) and, not least, on the results of the questionnaires on people's perceptions of adaptation to climate change. The analysis will be done at sector level, and the proposed sectors, presently adapted according to the current National Climate Change Strategy 2013-2020, are: *Agriculture and Fisheries, Forestry, Water Resources, Biodiversity, Energy, Industry, Transport, Tourism and recreation, Public Health, Infrastructure and Urban Planning, Insurance and Education, Information and Awareness.*

Some of the indicators that may be examined in order to identify the main risks and vulnerabilities of sectors to climate change are presented below:

Sector	Indicators	Information source
<b>Agriculture</b>	- Land use	- Tempo Online
	- Average agricultural land surface	- Database, INS
	- Average production and yield for the	- 2010 Agricultural

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	<ul style="list-style-type: none"> <li><i>main crops</i></li> <li>- <i>Soil degradation status</i></li> <li>- <i>Current status of land improvement and irrigation infrastructure</i></li> <li>- <i>Annual precipitation amount</i></li> <li>- <i>Sunshine duration</i></li> <li>- <i>Number of vegetation fires</i></li> <li>- <i>Irrigation systems</i></li> </ul>	<ul style="list-style-type: none"> <li><i>Census, INS</i></li> <li>- <i>Regional Meteorological Centre</i></li> <li>- <i>Inspectorate for Emergency Situations</i></li> </ul>
<b>Forestry</b>	<ul style="list-style-type: none"> <li>- <i>Surface area, structure and health condition of forests</i></li> <li>- <i>Number of forest fires</i></li> <li>- <i>Surface area of forest belts</i></li> <li>- <i>Forestry works performed</i></li> <li>- <i>Forest management</i></li> </ul>	<ul style="list-style-type: none"> <li>- <i>National Forestry Authority – Forestry Department</i></li> <li>- <i>Inspectorate for Emergency Situations</i></li> </ul>
<b>Water resources</b>	<ul style="list-style-type: none"> <li>- <i>Drainage density</i></li> <li>- <i>Water resources</i></li> <li>- <i>Surface water quality</i></li> <li>- <i>Domestic and non-domestic consumption</i></li> <li>- <i>Water and wastewater infrastructure</i></li> <li>- <i>Flood protection infrastructure</i></li> <li>- <i>Flood risk</i></li> </ul>	<ul style="list-style-type: none"> <li>- <i>Tempo Online Database, INS</i></li> <li>- <i>2011 Census of Population and Housing, INS</i></li> <li>- <i>Annual Environmental Report, APM</i></li> <li>- <i>Statistics and data provided by water-utility operators</i></li> <li>- <i>Inspectorate for Emergency Situations</i></li> </ul>
<b>Biodiversity</b>	<ul style="list-style-type: none"> <li>- <i>Surface of protected areas</i></li> <li>- <i>Status and vulnerabilities of habitats and ecosystems</i></li> <li>- <i>Management of protected areas</i></li> </ul>	<ul style="list-style-type: none"> <li>- <i>Annual Environmental Report, APM</i></li> <li>- <i>Statistics and data provided by protected area management / custody structures</i></li> </ul>
<b>Energy</b>	<ul style="list-style-type: none"> <li>- <i>Energy offer and demand (electrical, thermal, cogeneration), structure of production and consumption</i></li> <li>- <i>Energy network infrastructure</i></li> <li>- <i>Energy consumption by public and private buildings, economic sector, public lighting and transport systems</i></li> <li>- <i>Energy prices</i></li> <li>- <i>Energy efficiency improvement works</i></li> </ul>	<ul style="list-style-type: none"> <li>- <i>2011 Census of Population and Housing, INS</i></li> <li>- <i>National Regulatory Authority for Energy</i></li> <li>- <i>Statistics and data provided by operators</i></li> <li>- <i>Sustainable Energy Action Plan</i></li> </ul>
<b>Industry</b>	<ul style="list-style-type: none"> <li>- <i>Dynamics and structure of industrial production</i></li> <li>- <i>Industrial consumption of material and energy resources</i></li> <li>- <i>Average price of raw materials and energy</i></li> <li>- <i>Amount and structure of international</i></li> </ul>	<ul style="list-style-type: none"> <li>- <i>Tempo Online Database, INS</i></li> </ul>

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	<i>trading</i>	
<b>Transport</b>	<ul style="list-style-type: none"> <li>- Status / wear of transport infrastructure</li> <li>- Traffic volume</li> <li>- Number of vehicles</li> <li>- Travel duration and speed</li> <li>- Weather event impact onto the transportation infrastructure and activities</li> <li>- Mass transportation infrastructure and quality</li> <li>- Alternative transportation infrastructure</li> </ul>	<ul style="list-style-type: none"> <li>- Tempo Online Database, INS</li> <li>- Traffic studies</li> <li>- Sustainable Urban Mobility Plan (SUMP)</li> <li>- Statistics and information provided by mass transportation, rail, and airline operators</li> </ul>
<b>Tourism and recreation</b>	<ul style="list-style-type: none"> <li>- Volume and structure of tourism and recreational activities</li> <li>- Current types of tourism</li> <li>- Current accommodation and leisure infrastructure</li> <li>- Tourist movement (volume, seasonality, dynamics)</li> <li>- Tourist offers</li> </ul>	<ul style="list-style-type: none"> <li>- Tempo Online Database, INS</li> </ul>
<b>Public health</b>	<ul style="list-style-type: none"> <li>- Morbidity rate and dynamics</li> <li>- Mortality rates and dynamics</li> <li>- Number of emergency interventions</li> <li>- Infrastructure and human resources involved in emergency situations</li> </ul>	<ul style="list-style-type: none"> <li>- Tempo Online Database, Statistical Bulletins, INS</li> <li>- Inspectorate for Emergency Situations</li> <li>- Public Health Department</li> <li>- Statistics and data provided by healthcare and social care units</li> </ul>
<b>Infrastructure and urban planning</b>	<ul style="list-style-type: none"> <li>- Structure of urban land use (zoning)</li> <li>- Urban planning and construction regulations in force</li> <li>- Pace of housing and other building construction</li> <li>- Current urban transportation, energy, technical infrastructure</li> <li>- Number of buildings vulnerable to natural hazards</li> <li>- Risk analysis and control plans</li> <li>- Administrative capacity for risk management</li> </ul>	<ul style="list-style-type: none"> <li>- Tempo Online Database, INS</li> <li>- Territorial report, GUP</li> <li>- Register of Green Areas</li> <li>- Water Management System</li> <li>- Integrated Urban Development Strategy</li> </ul>
<b>Insurance</b>	<ul style="list-style-type: none"> <li>- Insurance product offers for extreme weather events</li> <li>- Percentage of insured housing</li> </ul>	<ul style="list-style-type: none"> <li>- Insurance companies</li> <li>- National Association of Insurance Companies of Romania</li> </ul>
<b>Education,</b>	<ul style="list-style-type: none"> <li>- Current educational products</li> </ul>	<ul style="list-style-type: none"> <li>- Tempo Online</li> </ul>

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<b>Information and Awareness</b>	<ul style="list-style-type: none"> <li>- Public information and awareness levels</li> <li>- Current secondary and tertiary education Curricula</li> <li>- Skills and qualifications of the public sector employees</li> <li>- Research – development – innovation activities</li> </ul>	<ul style="list-style-type: none"> <li>- Database, INS</li> <li>- School Inspectorate</li> <li>- Universities</li> <li>- Survey on population</li> <li>- Research institutes and centres</li> </ul>
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Moreover, we present below some questions proposed for the survey on population:

**Have you heard of "climate change"?:** yes / no

**Personally, do you feel that, in recent years, the climate is different from the previous ones (has recorded major changes)?:** da / nu

**If yes, what changes have you noticed?:** increased extreme event frequency / air temperature / precipitation amount / other

**Do you think climate change might affect you as an individual?:** very much/ much/ not much / not at all

**"Climate change may affect me much and very much". Why do you say that?:** ...

**"Climate change can affect me less and very little". Why do you say that?:** ...

**In your opinion, what causes the climate change?:** pollution/ urban development/ population growth/ natural causes / other

**Do you think climate change can affect the municipality/ city?:** very much/ much/ not much / not at all

**If yes, which of the following effects do you think should be first approached?:** dry of vegetation due to droughts / decreased rainfall in winter/ decrease in drinking water resources/ local floods / asphalt damage due to traffic at high temperatures / aerial cable breakage due to storms and strong winds / other effects

**What would you do for your personal adaptation to climate change?:** sign voluntary home and goods insurance against losses from natural disasters / allocation of more financial resources and time for house maintenance, to increase its adaptation level to climate change/ pay higher taxes to increase the public funds allocated to adaptation support/ nothing

**How important do you think the following measures are to your municipality/ city? (very important, important, less important, not important):** expand the green areas in the city center to improve the traffic congestion management capacity/ reduce the drinking water consumption and treat wastewaters for adaptation to potential drought periods / orientation towards other types of tourism, except for the winter ones, for adaptation to the reduced snowfall / underground cabling of the aerial ones / development of a local flood prevention strategy/ protection of vegetation and forests against summer pests or fires / restricted heavy traffic in hot days to protect the asphalt / public information on dangerous disease-spreading and prevention measures

**On a scale from 10 (the most important problem of the municipality) to 1 (least important problem of the municipality), where would you place the climate change adaptation issues?**

**Who do you think should be in charge with the adaptation to climate change?:** Government/ local government / international organization (UN) / Environmental Protection NGOs / local companies and enterprises / citizens/ other

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Once analyzed the abovementioned quantitative and qualitative information, a summary of the risk and vulnerability analysis and assessment will be produced for each sector, including the following aspects:

- ✓ *Name of the analyzed sector*
- ✓ *Analysis and evaluation indicators considered*
- ✓ *Summary of the conclusions of the risk and vulnerability analysis (Annex 1 presents examples of risks by sectors)*
- ✓ *List of major problems / threats to be approached by the adaptation measures*
- ✓ *List of main opportunities to be used (Annex 2 presents examples of opportunities by sectors)*

2.2.2 Identifying the vulnerable sectors and areas

Next, a prioritization of the sectors requiring climate change adaptation measures will be performed, starting from the sector analysis, in order to find the answer to the following question: ***If climate change affects the city and has multiple effects in different sectors, which of them should be first approached to facilitate the adaptation?***

For this purpose, one can use a prioritization matrix, starting from filling in a table for each analyzed sector that ensures the link between: cause – vulnerability – risk – effect. It can use the participative approach to this process.

The following have been considered as potential causes:

- drought / lack of water resources
- extreme temperature – heat, frost
- extreme precipitation – heavy snowfall, flood
- lack of precipitation
- wind, storms, blizzards
- fog

The risk assessment was done by estimating the climate change impact (share of target group affected - residents, tourists, businesses, farmers, foresters) on each risk and by considering the probability that a certain change occurs, on a scale from 1 to 5, where 1 is very low-impact low-probability, and 5 high-impact, high probability, according to the template below:

	1 pct.	2 pct.	3 pct.	4 pct.	5 pct.
	<b>Very low</b>	<b>low</b>	<b>average</b>	<b>high</b>	<b>Very high</b>
Impact (share of target group affected)	below 1%	1-9%	10-49%	50-99%	100%

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	Low	low-average	average	average-high	high
Probability	Every 50 years	10 - 50 years	5 - 10 years	1 - 5 years	Several times a year

Table 5. Template of cause – vulnerability – risk – effect link.

Cause	Vulnerability	Risk	Effect	Probability (1-5)	Impact (1-5)	Score (I* P)	
Drought	Lack of irrigation systems	R1	Soil water deficit, plant dryness	Decreasing agricultural production	3	4	12
	Lack of drainage channels	R2	Excess soil moisture, rotting plants floods	Swamp formation, decreasing agricultural production	3	2	6
Heavy precipitation	Lack of land improvement works	R3	Soil erosion	Land degradation, reduced farmland	1	1	1
	...	Rn	...	...	...	...	...

Following the completion of these tables, each identified risk gets a score calculated as the Impact \* Probability product.

The total score of each sector is calculated as the average of the scores given to the risks identified for the sector, after eliminating the sectors at low risk (1-2 points).

Model of risk assessment matrix

<b>Impact</b>	Very high (5)	5	10	15	20	25	<b>Risk</b>	
	High (4)	4	8	12	16	20		Very high
	Average (3)	3	6	9	12	15		High
	Low (2)	2	4	6	8	10		Average
	Very low(1)	1	2	3	4	5		Low

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Low (1)	Low-average (2)	Average (3)	Average - high (4)	High (5)
<b>Probability</b>				

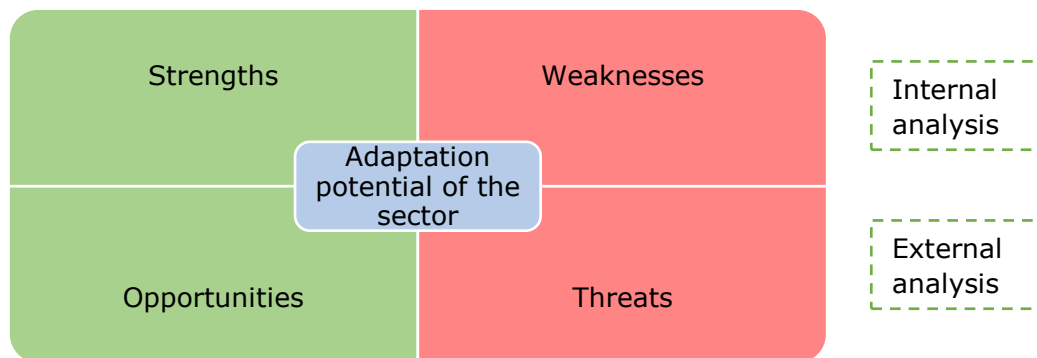
Based on the above matrix, the sectors are framed, in terms of risk, on a scale from very high-risk to high-medium-low type. A sector with a score of 15-25 points is considered at high risk, and low risk sectors are those that have achieved 1-2 score points. Such sectors may be ranked according to the average score. One can choose four to five sectors based on the average number of points, but discussions with stakeholders on the importance of the sector in the municipality / city, as well as the capacity of authorities to initiate adaptation measures in this sector and strategies on actions for adaptation to climate change are also necessary. The Education, information, and awareness sector is considered to be transversal, as the actions in this sector can support all the other sectors.

### 2.2.3 SWOT analysis

The next step involves the elaboration of SWOT analysis for the selected priority sectors, that answers to the following question: **What are the strengths, weaknesses, threats and opportunities of the municipality / city with regard to the identified priority sectors to be adapted?**

In fact, the SWOT analysis focuses on the internal feasibility (strengths, weaknesses) and the external feasibility (opportunities, threats). Thus, the following will be identified for each sector:

- ✓ external trends, possibly to occur in the future, out of the planner’s control, which may be desirable (opportunities) or undesirable (threats)
- ✓ strengths and internal resources of the territory, which currently exist and are under the planner’s control (desirable) and weaknesses or insufficiencies of the territory, which currently exist and are under the planner’s control



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The decision-making process should include the following:

- ✓ to build on the strengths
- ✓ to eliminate the weaknesses
- ✓ to exploit the opportunities
- ✓ to remove the threats

## 2.2.4 Setting the general directions and defining the alternatives

To set the general directions and define the alternatives, we propose three complementary tools detailed below, which can be used in parallel:

- ✓ SWOT analysis by chains and SWOT strategy matrix
- ✓ The problem tree and the objective tree
- ✓ Fishbone diagram

✓ SWOT analysis by chains and SWOT strategy matrix<sup>1</sup>:

Chains are built for each risk identified within these priority sectors, based on the classical elements of SWOT analysis, as follow:

<i>City weaknesses (that make it vulnerable to threats)</i>	<b>Natural threat (hazard or mix of hazards)</b>	<i>Strengths of the city (that reduce its vulnerability to threats)</i>
<i>City weaknesses (that reduce the possibility of exploiting opportunities)</i>	<b>Natural opportunity (hazard or mix of hazards)</b>	<i>Strengths of the city (that increase the possibility of using opportunities)</i>

There, a threat is not real, unless:

- ✓ The territory has weaknesses that enhance the actual threats
- ✓ There are insufficient strengths that might reduce the negative impact of actual threats

An opportunity is not real, unless:

- ✓ The territory has specific strengths that enhance the use of opportunities
- ✓ There are insufficient weaknesses hampering the enhancement of opportunities

<sup>1</sup> Adaptation of Cocean, R., Moiescu, O.I., Toader, V. (2014)

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Threat + weaknesses – strengths = MAJOR PROBLEM

Opportunity + strengths – weaknesses = MAJOR OPPORTUNITY

Table 6. Example of SWOT analysis by chains – Braşov Municipality, Infrastructure and Urban Planning sector

Identified risk	Emphasizing the negative impact of heat islands	
Possible impact	Excess thermal comfort, increased energy consumption for air conditioning	
City weaknesses	Natural threat	City strengths
Urban heat islands extended and multiplied over the last 30 years	<b>Rising temperatures in summer + heat</b> <i>People affected:</i> population in heat island areas and the passerby <i>Action mechanism:</i> higher temperatures are felt stronger in areas affected by urban heat islands	Partnership with the City Hall in the project and strategy
Temperature deviations between city center and the adjacent sub-urban or rural areas might reach 9-10° Celsius		Urban mobility Plan and PAED approved / under approval
Within the city, the residential neighborhoods generate urban heat islands		Green areas with construction restrictions
Identified opportunity	Emphasizing the positive impact of heat islands	
Possible Impact	Reduced energy consumption in the cold season, increased thermal comfort	
City weaknesses	Natural opportunity	City strengths
	<b>Rising temperatures in the cold season</b> <i>Favoured people:</i> population in heat island areas and the passerby <i>Action mechanism:</i> higher temperatures in the cold season reduce: - the need for heating the housing and offices - street snowmelt time	Urban heat islands have extended and multiplied over the last 30 years
		Temperature deviations between city center and the adjacent sub-urban or rural areas might reach 9-10° Celsius
		Within the city, the residential neighborhoods generate urban heat islands
		Most residents use gas heating boilers for their apartments

It is noticed that the hazard is seen as an opportunity or threat, and that weaknesses (which show the vulnerability and reduce the opportunity) and strengths (which reduce the vulnerability and enhance the use of opportunity) have been identified. The next step of defining the strategy objectives may target:

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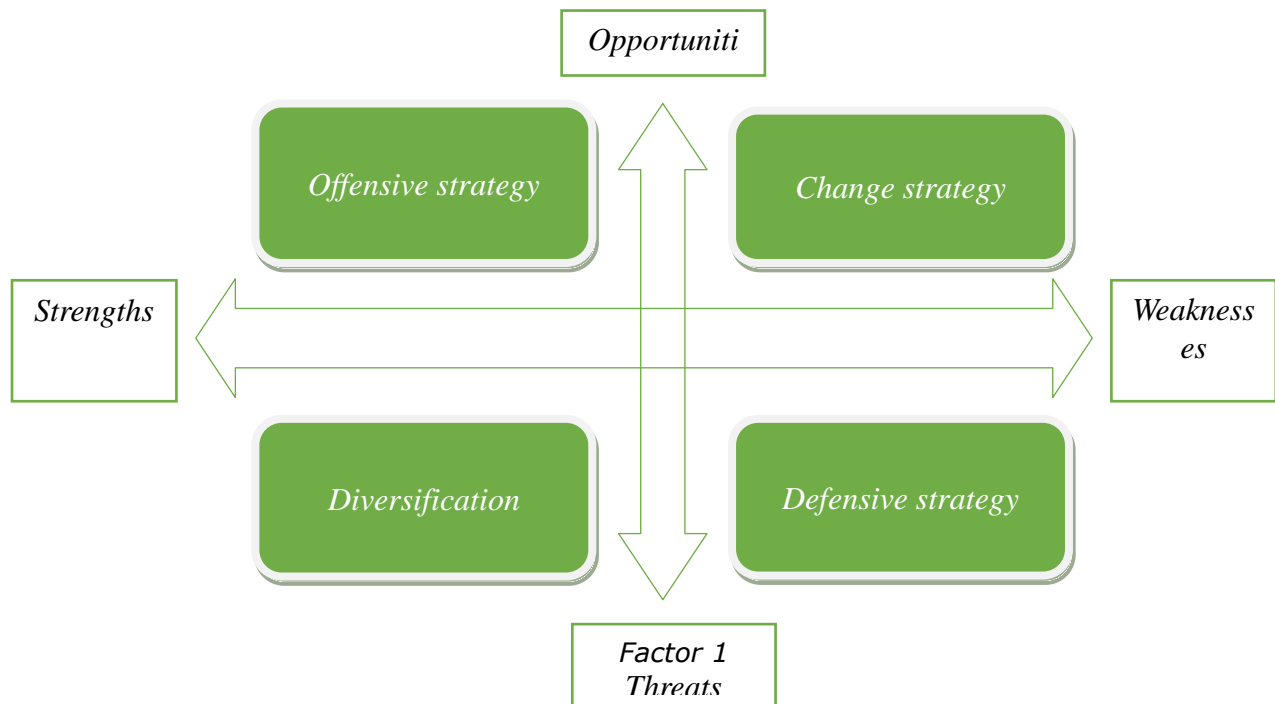
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- ✓ Avoiding the production of major problems (by removing weaknesses and enhancing the strengths)
- ✓ Enhancing the opportunities (by enhancing the strengths and removing the weaknesses)

SWOT strategy matrix



The figure above presents the four types of strategies that can be chosen based on SWOT analysis:

- ✓ *Change-oriented strategy* – removal of weaknesses through enhancement of opportunities
- ✓ *Defensive strategy* – removal of weaknesses to prevent the negative impact of threats
- ✓ *Diversification* – use of strengths to prevent the negative impact of threats
- ✓ *Offensive strategy* – use of strengths to enhance the opportunities

✓ *Problem and Objective Trees method:*

This method allows viewing problems as a tree-like diagram, called the problem tree, and is built on the cause – effect relationships.

The steps to be followed in the elaboration of the problem tree are:

- ✓ Identifying the existing problems (this is the link to the previous steps, the analysis of risks and vulnerabilities and SWOT analysis)

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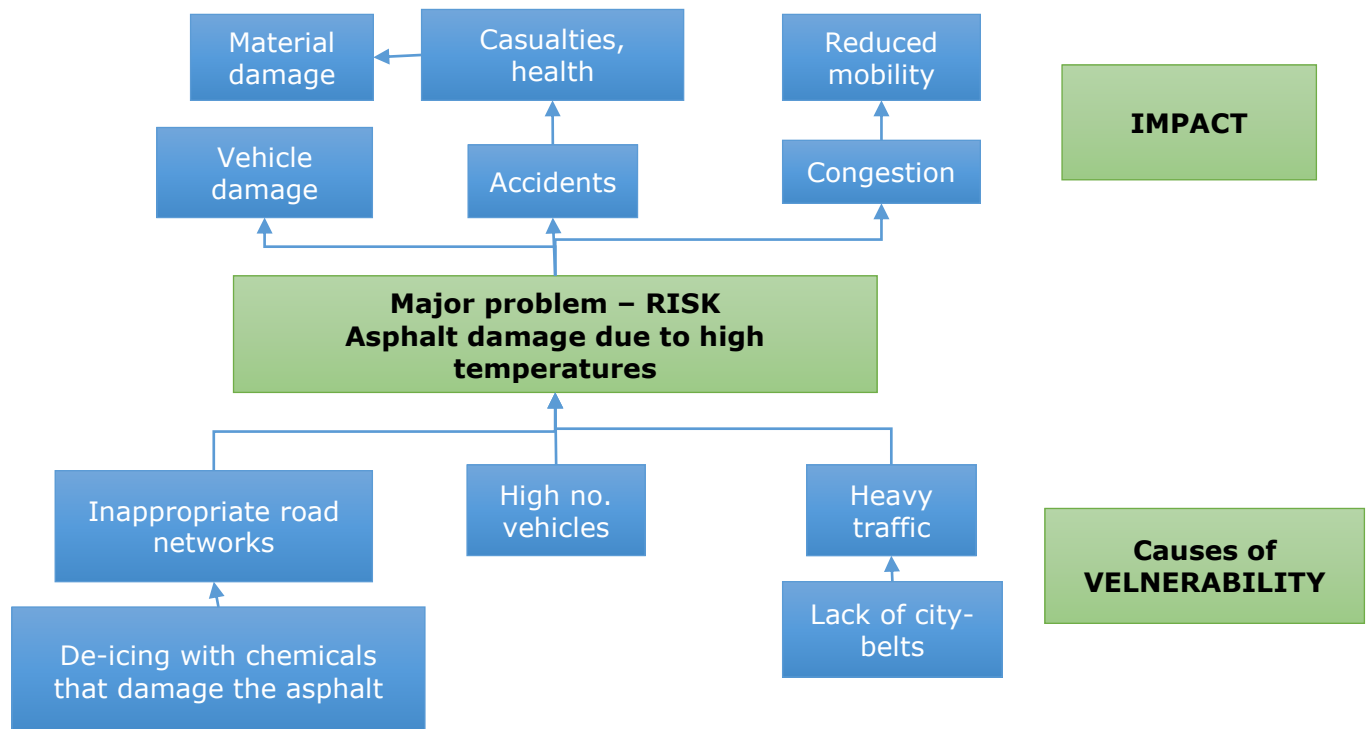
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- ✓ Choosing a basic problem (a major problem in the SWOT by chains)
- ✓ Identifying the issues related to this major problem
- ✓ Prioritizing the causes and effects

The last step is the actual building of the chart by finding answers to the following questions:

- ✓ What problems are direct effects of the major problem? These are placed on the top
- ✓ If a problem is neither cause, nor effect, it is placed at the same level to form another tree
- ✓ What problems cause the major problem? These are placed at the base

Problem tree



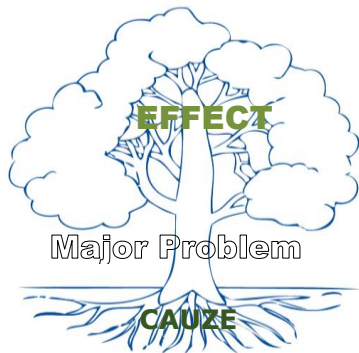
The next step consists of the analysis of objectives, to identify potential solutions to a given situation, and the presentation of a future situation to be reached by solving the problems.

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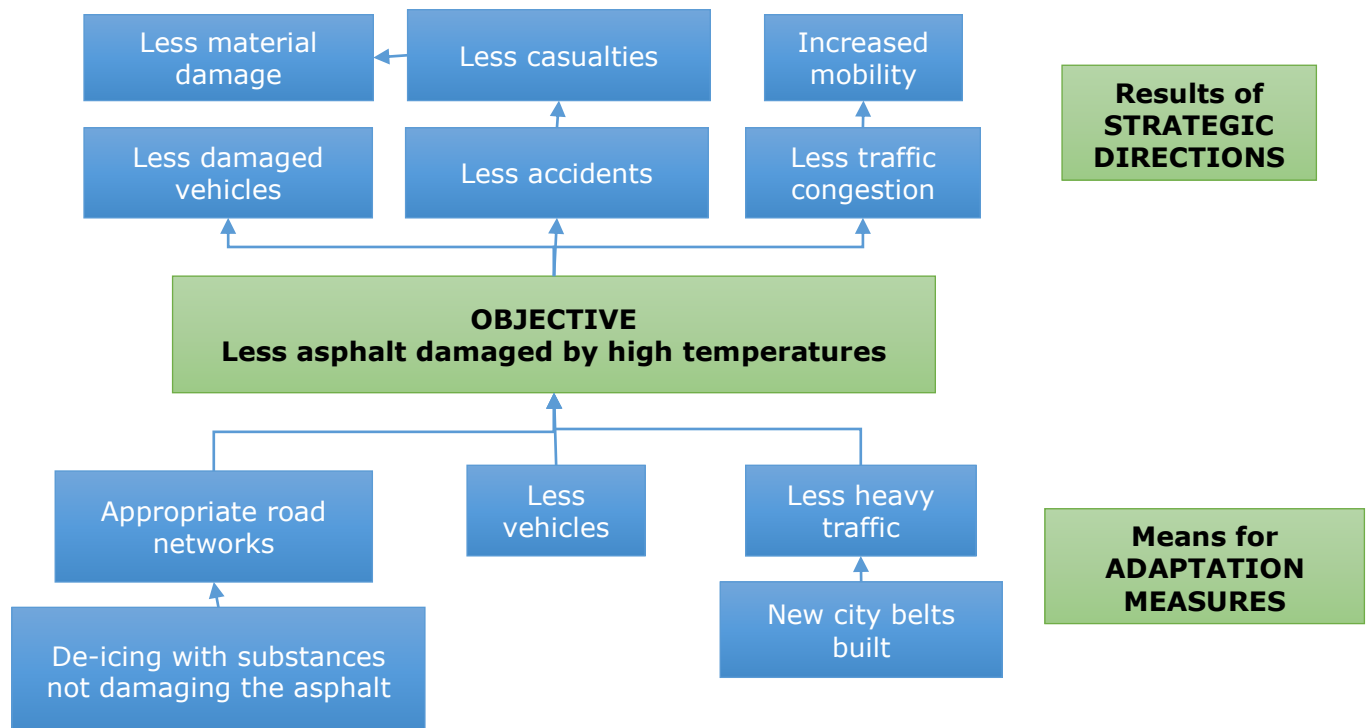


The negative situations identified in the problem tree are re-defined into desirable and realistic positive situations.



The negative aspects are turned into desirable positive aspects, and problems turned into objectives:

Objective tree



The following assessment criteria for various alternatives might be used:

- ✓ Relevance to large-scale strategies
- ✓ Complementary to other strategies
- ✓ Availability of financial resources

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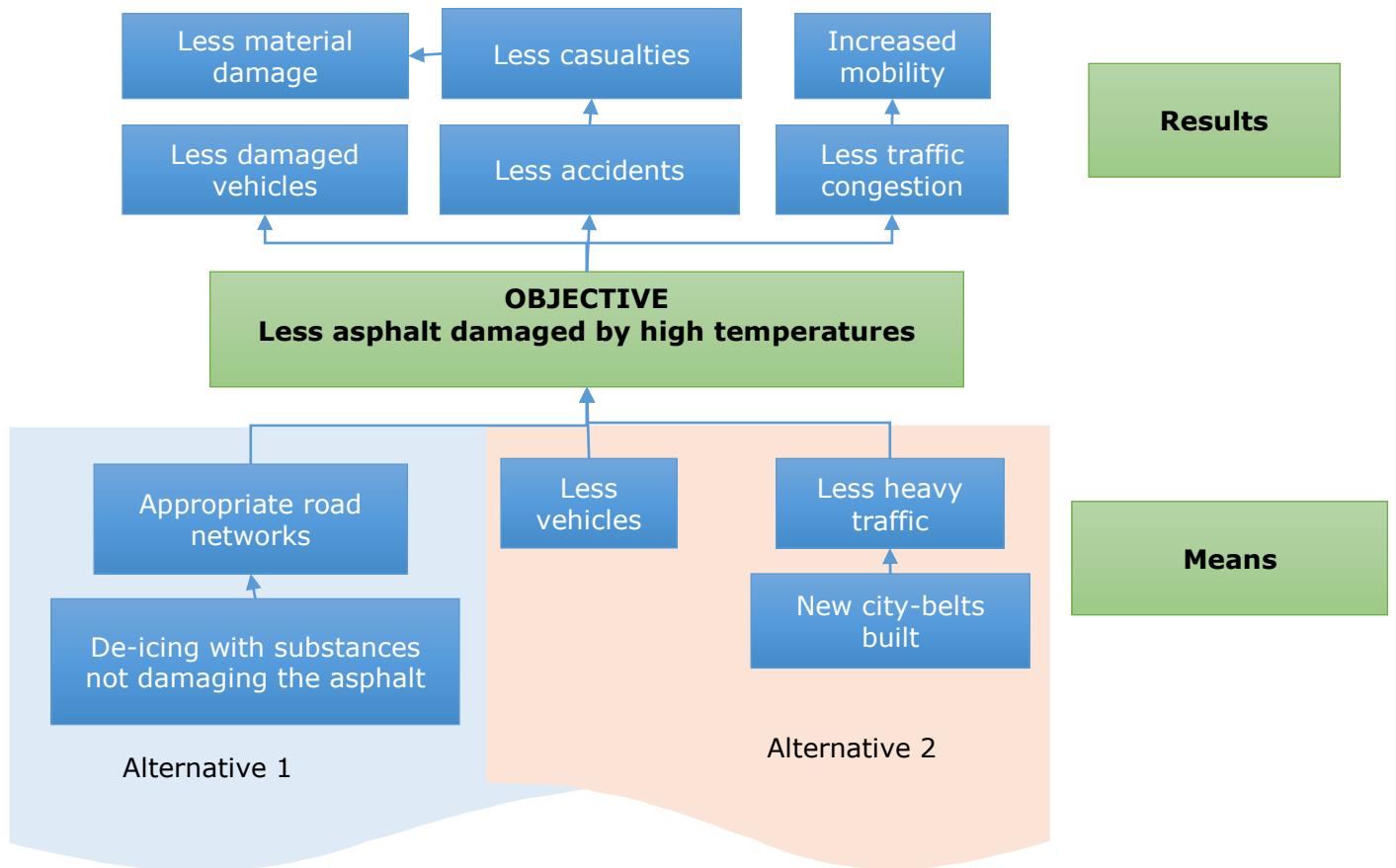
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- ✓ Availability of competences
- ✓ Importance granted to partners
- ✓ Emergency level
- ✓ Social acceptability

Strategic alternatives



The impact of these policy options is greater if they meet as many of the assessment abovementioned criteria as possible. To assess the impact of these strategies, some of these criteria may be given scores on a scale agreed with partners (eg. From 1 to n or high-medium-low): for significance, urgency, acceptability, or may consider additional criteria such as the number of beneficiaries, disadvantaged groups, number of problems solved, vs estimated budget vs available budget etc.

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✓ Fishbone diagram (Ishikawa)

Fishbone diagram is another cause-effect method, whose elaboration requires the steps below to be followed:

- ✓ Identifying the problem (risk)
- ✓ Identifying the causes of the problem (main cause or groups of causes generating the problem): institutional organization, procedures, human resources, financial resources, material resources, communication
- ✓ Identifying the secondary causes (vulnerabilities) – by category of stakeholders: central government, local government & local public institutions, citizens & NGOs, private companies
- ✓ Defining the objective starting from the problem (risk)
- ✓ Identifying the necessary measures – solutions that might remove the cause of the problem

In brief, the Fishbone Diagram can be represented as follows:

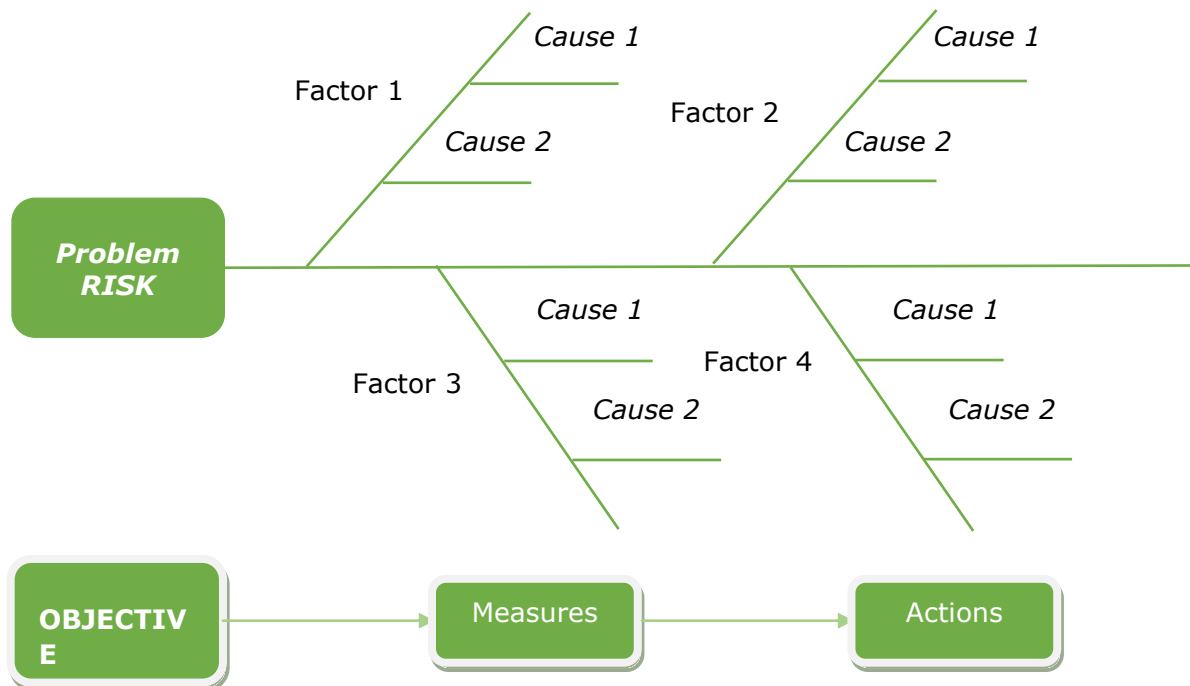


Table 7. Example of Fishbone diagram – Infrastructure and Urban Planning sector

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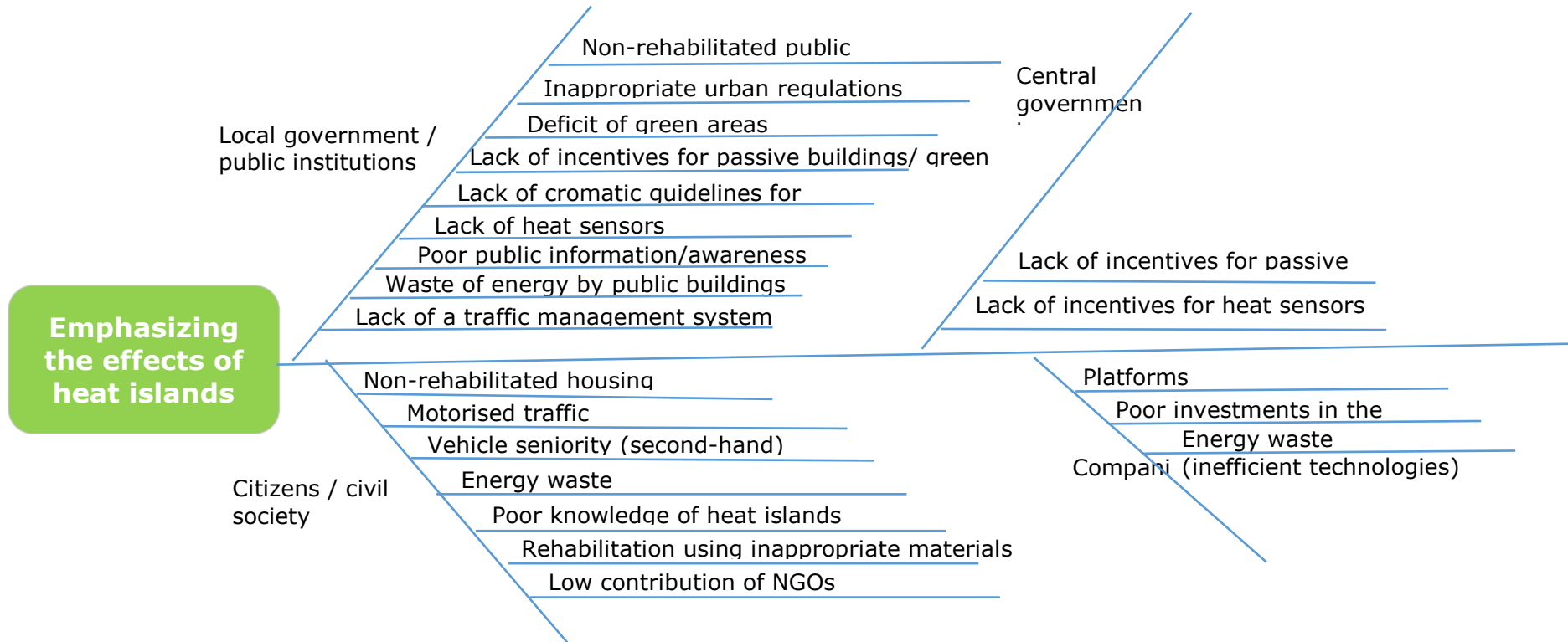




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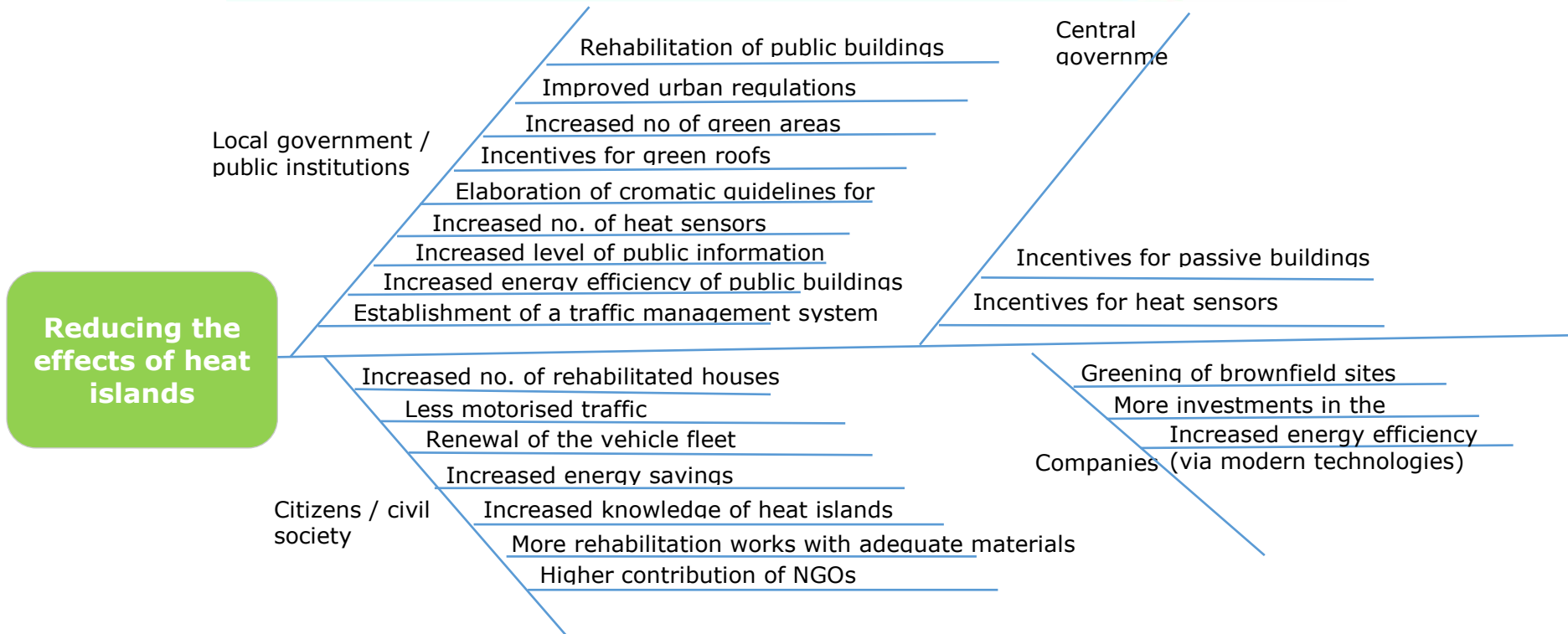




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## 2.2.5 Setting the strategy-related visions, targets, scenarios, objectives and measures

The vision is a description of the desired destination and reasoning to reach this destination, allowing the community members to look into the future, to think creatively and to wonder how they would want their community to be in 20 or 50 years. This presents an ideal image of the territory at the end of the planning period.

A shared vision:

- ✓ Leads to common understanding
- ✓ May be a powerful communication tool
- ✓ On the long-term, it may direct policies towards a sustainable future

The vision should be developed through a participatory process involving all categories of stakeholders. Each participant must define its own vision by taking into account the economic, social and environmental aspects.

Vision	Economic	Social	Environment
Citizens			
Companies			
Visitors and tourists			
Public institutions			

One possible instrument to be used for developing the vision is the questionnaire, as the template presented below

**Given the adaptation to climate change ....**

- ✓ *In your opinion, what words describe best your locality?*
- ✓ *What things do you like most in your locality?*
- ✓ *What aspects of your locality would you present to visitors / tourists?*
- ✓ *What do citizens miss most?*
- ✓ *What is the climate change impact on your locality?*
- ✓ *What is the first thing you'd do to adapt your community to climate changes?*
- ✓ *How would like your locality to look like in 2050?*
- ✓ *How should the citizens of your locality act in 2050 in order to adapt the locality better to climate change?*

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Table 8. Example of vision – Sibiu Municipality

*By 2050, Sibiu Municipality will be a community with a sustainable growth, resilient to climate changes, a green and clean city that ensures a healthy, attractive and safe environment for its inhabitants, with citizens aware of the importance of adapting to climate change, responsible for the environment, and whose behavior is adapted correspondingly.*

*The adaptation measures will be undertaken, also through proactive and innovative actions, by both the population and the business, academic and non-governmental environment, under the direction of an efficient and responsible local government, always in dialogue with the local civil society and citizens.*

*The adaptation to climate change will be mainly achieved in the vulnerable sectors identified as priorities at the local level, namely the infrastructure and urban planning, with a focus on preventing the spread of heat islands, the urban transport by encouraging the use of public and alternative transportation, water resources, health, education - information and awareness.*

The vision and the vulnerable sectors represent the starting point in defining the strategic objectives. These objectives can be defined:

- ✓ by each vulnerable sector or
- ✓ by aspects: economic, social, environmental or
- ✓ by category of beneficiaries: citizens, companies, tourists/visitors, government/public institutions

The objectives are defined by an action verb (e.g. increase / reduce / make aware of) and a noun for the subject (e.g.). Strategic objectives should be defined as SMART:

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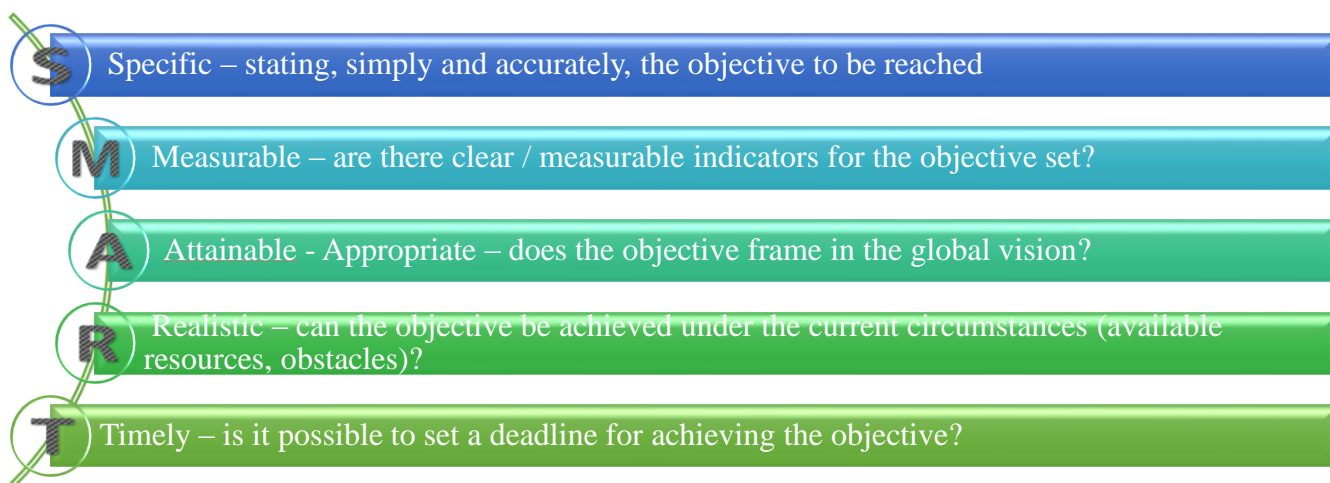
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These objectives reflect the long-term impact of the strategy. Also, based on the priority risks identified using the problem tree and fishbone diagram, the measures, detailing the results to be obtained following the implementation strategy, will be defined.

Table 9. Example of sector objectives and measures for the Education, information, awareness sector – Sibiu Municipality

Sector	Sector Objectives
<b>Infrastructure and urban planning</b>	1. Reducing the surface of urban heat islands in Sibiu by 10%, at least, by the end of 2020, and minimum 50% by 2050
<b>Public health</b>	2. Decreasing the number of climate change-related casualties by minimum 10% by 2020, and 20% by 2050
<b>Transportation</b>	3. Reducing the waiting times / traffic delays (by car, public transport and airway) by min. 15% by 2020, and by 30% by 2050. Increase the share of people using the public transportation by min. 10% by 2020, and 25% by 2050
<b>Water resources</b>	4. Providing access to quality drinking water through a centralized water supply system to 100% citizens by 2020
<b>Education, information, awareness</b>	5. Increasing the number of people informed and aware of the climate-change issues by minimum 15% by 2020, and 50% by 2050
EDUCATION, INFORMATION, AWARENESS	
Specific Objective	Measures
<b>5.1. Rising the institutional and autonomous capacity to adapt to climate changes and ensuring an appropriate behaviour in case of hazards</b>	5.1.1 Increasing the information and awareness level, also through formal and non-formal education, regarding the adaptation to climate changes
	5.1.2 Encouraging the applied research and transfer of best practices and know-how in the field of adaptation to climate change

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## 2.2.6 Evaluation and selection of alternatives (prioritizing the measures)

The next step is the evaluation and selection of alternatives, by prioritizing the measures, provided that several decisions on the various intervention scenarios to be approached have been taken in prior. The following are some categories of scenarios for selecting the best one through discussions with the stakeholders.

Possible scenarios:

- ✓ Interventions by the government / public institutions
- ✓ Interventions by citizens/ civil society
- ✓ Interventions by private companies
- ✓ **Mixed interventions** – the most complex, given the interventions undertaken by all categories of relevant actors in the city, thus ensuring their correlation and integration, and, of course, a greater impact on the territory and the sector of interest.

Options for approaching the adaptation:

- *“Soft” non-structural approaches* – design and implementation of policies and procedures, land use control, information dissemination, and economic incentives to reduce and prevent the vulnerability to disasters. (Human systems management)
- *“Green” structural approaches* – help increase the resilience of ecosystems, aiming at the same time, to stop the loss of biodiversity and the ecosystem degradation, restoring the water cycle, and using functions and services provided by ecosystems to achieve more cost-effective, and sometimes more feasible, adaptation solutions than relying solely on the grey infrastructure
- *“Grey” infrastructure approaches* (hard actions) – physical intervention (using engineering services) to make buildings and infrastructures that are essential for the social and economic wellbeing of society, more resilient to extreme events caused by climate change

Some adaptation alternatives are presented below:

- ✓ *No-regrets* – adaptation measures that worth being adopted (provide real social and economic benefits) regardless of future climate change. It includes measures which are justified (in terms of profitability) in the present climate conditions, and are justified for the future, if their adoption is consistent with the risks associated with the forecasted changes. They are suitable in the short term because there is a higher probability of being implemented (provide obvious and immediate benefits) and may provide the necessary experience for conducting future assessments of climate risks and adaptation measures: Actions aimed at strengthening the capacity of adaptation as part of a global adaptation strategy;

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Avoiding construction works in high-risk areas (eg. Floodplains); reducing the water supply network loss; Design / construction of properties and buildings to minimize the overheating in summer months; Reducing the consequences of floods by using waterproof materials (floors, walls); The introduction of multi-seasonal recreation facilities

- ✓ *Low-regrets (or limited regrets)* - adaptation measures for which the associated costs are relatively low and the benefits can be relatively high: Buildings with adjacent spaces to allow future changes (e.g. ventilation, drainage), consistent with the expected changes in temperature and precipitation; Restricting the type and degree of development in flood-prone areas; Promoting the creation and preservation of areas (roadsides, farmland, green areas, roofs) to support the biodiversity
- ✓ *Win-Win* - adaptation measures that lead to the desired result in terms of minimizing climate risks or potential exploitation opportunities, as well as other social, environmental or economic benefits. Win-win options are often associated with those measures or activities addressing the climate change impact, but also contribute to their mitigation or other social and environmental objectives. These types of measures include the primary ones taken for reasons other than climate risks, but also ensure the desired benefits of adaptation: flood management which helps the objectives of biodiversity support and habitat conservation; Improving the response and emergency planning capacity to deal with risks (including the climate-related ones); Improving the cooling capacity of buildings by increasing the solar shading level or adoption of less intensive cooling strategies in terms of energy; Green roofs and walls that have multiple benefits in terms of reducing the temperature of the building, rainwater drainage, extended green areas, and reducing the energy use for both heating and cooling
- ✓ *Flexible and adjustable management* - implementation of progressive adaptation options, and not taking one-time adaptation measures widely, thus allowing the avoidance of mistakes and adaptation to changes that occur over time in terms of knowledge, experience, technologies (eg. postponing the adoption of a measure / set of adaptation measures, provided that this decision is accompanied by a commitment to continue the adjustment, along with the monitoring and evaluation of risk development). Such a decision of deferral is taken when the climate risks are below a certain threshold or when resilience (regulations, institutional circumstances) is insufficient to allow such actions be initiated: Postponing the implementation of specific measures to adapt, while exploring other options and working with the appropriate administrative levels to achieve the necessary standards and regulations; Progressive development and investment in recreation consistent with the forecasted climate changes (eg. progressive investments in the development and promotion of multi-seasonal leisure activities).

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The following criteria may be considered for prioritizing the measures

- ✓ C1. Relevance to large-scale strategies / complementary with other strategies – 1 point, if relevant to adaptation to climate change
- ✓ C2. Target sectors: Agriculture, Forestry, Water resources, Biodiversity, Energy and telecommunication, Industry, Transportation, Tourism and leisure, Public health, Infrastructure and Urban Planning, Insurance, Education, information and awareness – 1 point, if it addresses several sectors
- ✓ C3. Number of risks addressed – 1 point, if it addresses several risks
- ✓ C4. Emergency – 1 point, if urgent (score points exceeds 15 – high risk)
- ✓ C5. Main lead – 1 point, if the measure is implemented by the local government
- ✓ C6. Impact: economic, social, environmental – 1 point, if it impacts all three
- ✓ C7. Availability of financial resources – 1 point if financed from external sources
- ✓ C8. Implementation capacity (availability of human resources /knowledge) – 1 point if the necessary resources for implementation exist
- ✓ C9. Social acceptability – 1 point, if the measure is accepted
- ✓ C10. Legislation – 1 point, if the required legal framework exists

Thus, each measure per sector will be awarded a score, followed by their classification, as presented in the table below:

Sector 1 Proposed measure	SCORE POINTS										TOTAL
	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	
<b>M1</b>	1	1	1	1	1	1	1	1	1	1	10
<b>M2</b>	1	1	0	1	1	1	1	1	1	1	9
<b>M3</b>	1	1	0	1	1	0	1	1	1	1	8
<b>M...</b>											
<b>Mn</b>	1	1	1	0	0	0	1	0	1	1	7

The discussions with stakeholders will generate the priority measures that obtain a total score above 7-8 points.

Table 10. Example of classification of measures – Tg. Mureș Municipality, Public health sector (emphasizing the priority measures selected)

Proposed measure	SCORE POINTS										TOTAL
	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	
Increasing the number and capacity of shelters for the homeless	1	1	1	1	1	1	0	1	1	1	9
Ensuring the proper sanitation of streets, sidewalks and drainage system, along with an efficient waste management	1	1	1	1	1	1	0	1	1	1	9
Expansion and rehabilitation of water and wastewater infrastructure (divided system)	1	1	1	0	1	1	1	1	1	1	9
Ensuring the proper pest and rat control within the municipality, and the correlation	1	1	1	1	1	1	0	1	1	1	9

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between the public and private pest control operations											
Ensuring the proper management of industrial waste (construction companies, the former brick factory)	1	1	1	1	0	1	0	1	1	1	8
Increasing the emergency care capacity of hospitals	1	0	1	1	0	0	0	1	1	1	6

## 2.2.7 Defining the actions and drafting the Action Plan

This stage identifies and describes the actions / projects necessary to achieve the objectives set in the strategy. Basically, the list of priority measures turn into a formal action plan. The action plan is a good way to establish responsibilities for implementing the adaptation actions and to take into account the obligations of the partners in the implementation phase.

The data collected, together with the list of adaptation actions, should be structured so that it can carry out a detailed plan showing concretely what should be done, by whom, by when, in order to implement the adaptation strategy. Moreover, the necessary resources to implement these actions (in terms of personnel, money) should be considered, too.

As types of actions covered by the measures, we have:

- ✓ informational / educational / awareness actions
- ✓ institutional / institutional capacity building actions
- ✓ investment actions
- ✓ political / legal actions

For each vulnerable sector, selected in the previous steps, and taking into account the priority measures chosen, will have:

- ✓ measures / actions proposed,
- ✓ connection with the specific objectives of the Strategy,
- ✓ organizations in charge and partners,
- ✓ proposed actions and necessary preparatory activities,
- ✓ expected results,
- ✓ deadlines
- ✓ estimated budget
- ✓ possible funding sources

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This information can be presented as a summary table:

Proposed measure/ action	The applicable objective of the strategy	Organizations in charge / Partners	Short description (proposed activities)	Expected results	Preparatory activities	Implementation deadline	Estimated budget	Funding sources

Table 11. Action plan example - Sibiu, Transportation sector

Proposed measure/ action	The applicable objective of the strategy	Organizations in charge / Partners	Short description (proposed activities)	Expected results	Preparatory activities	Implementation deadline	Estimated budget	Funding sources
<b>Expansion and modernization of water distribution networks, including the network of hydrants for emergencies</b>	Easing of restrictions on industrial consumption during periods of drought	Technical Department Investment Department S.C. WATER CANAL S.A. ADI Apa-Canal Business operators	1. Expansion and modernization of the public drinking water supply, including the installation of hydrants and building new connections.	Length of water network expanded 1 Km Rehabilitated water length: 55 km	Completion of SF	2020	27 mil. Euro	POIM 2014-2020 Local budget Own funds of the operator

It is important to note that this action plan is not static, but will be reviewed as new challenges, new results appear and it is important to involve a big number of partners in its development, especially those who might implement the proposed actions. Also, once achieved the action plan, it will be submitted to the City Council for approval and political accountability.

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## 2.3. Implementation of the strategy / action plan

### 2.3.1 Establishing the implementation mechanism (implementation procedures and political support)

The strategy and the action plan on adaptation to climate change can be developed as self standing documents, but most often, the actions are directed towards the integration of adaptation into existing strategic documents already available at local level (eg. Integrated Urban Development Strategy, the General Urban Plan, Action Plan on Sustainable Energy, Sustainable Urban Mobility Plan, etc.). In this context, it is important to make the link between the adaptation options and the existing programs and funding sources.

The implementation of the strategy will be coordinated by the author of the Strategy on adaptation to climate change (Mayor and Management Team / coordination of the City Hall), but will be achieved with the active involvement of all interested stakeholders, identified in the action plan as organizations/people in charge.

To ensure the smooth implementation of the strategy and operationalization of the strategic goals, we can use several tools, the most common being the Action Plan, as described above (see section 2.2.7), and the multi-year planning investments. In terms of multi-annual planning of investments, an estimate of the implementation costs required is needed and also the identification of the funding sources. Cost estimates take into account the activities in the Action Plan, which defined the projects eligible for funding. The number of these projects is forecasted together with the estimated cost for each project. The funding may be made from the yearly internal budget for the strategy implementation, from the external budget (repayable and non-repayable financial assistance), or from private funding sources (public-private partnership included).

In order to successfully implement the strategy and action plan, the following actions are proposed by all officers / partners involved (as mentioned in the third column of the Action Plan). The City Hall / City has the coordination role and the other partners will become members of the Monitoring Committee.

- ✓ Approval of the Strategy and Action Plan by the City Council, by adopting resolutions to this effect (this is how the political support is ensured);
- ✓ Developing, in collaboration with relevant bodies (eg. OAR and RUR), with local stakeholders and the adoption by Local Council of a regulation that approves and implements the local measures for adapting to climate change, that will become mandatory for all real estate developers until the next revision of PUG and RLU. If the process of reviewing the PUG and RLU will not be completed by that time,

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these measures will be included directly in the new versions of these urban planning documentation;

- ✓ Linking the Strategy and Action Plan to all the planning documents (urban, strategic-sectoral) subsequently developed at local level;
- ✓ Dissemination of the Strategy and Action Plan (in accordance with the proposed communication measures);
- ✓ Development of substantiating / opportunity studies needed to implement the adaptation to climate changes measures proposed in the strategy and action plan (eg. flooding studies, risk assessment of buildings, mobility, etc.);
- ✓ Development of technical and economic documents related to the projects identified in the action plan;
- ✓ Identifying, analyzing and selecting the funding sources for the projects proposed for implementation;
- ✓ Identification of public and private partners to develop and implement projects;
- ✓ Signing partnership agreements between the City Hall and the relevant actors at local, county and national levels for the development of the projects in the Action Plan;
- ✓ Identify and inform the potential beneficiaries on the existing complementary funding sources, in order to increase the absorption of European funds;
- ✓ Annual budget planning given the resources needed to implement projects;
- ✓ Preparing the institutional and human resources for the successful implementation of the projects;
- ✓ Project implementation;
- ✓ Promotion of project results at national and international level (promotional materials, participation in international events, websites, etc.);
- ✓ Monitoring the progress of project implementation and the production of progress reports;
- ✓ The interim evaluation of the Strategy and Action Plan;
- ✓ Reviewing the Strategy and Action Plan based on the evaluation and corrective action.

### 2.3.2 Communication and Dissemination Actions

In terms of the communication / dissemination strategy to the local stakeholders and the general audience, following its approval by the Local Council, some concrete actions that could be envisaged for 2014-2020 are proposed below:

- ✓ Organizing a press conference and issuing a press release by the Municipality, on the adoption of the Strategy and Action Plan by the City Council;
- ✓ Promoting the Strategy and Action Plan in the virtual environment, through postings on the website and the Facebook page of the City Hall and the partner institutions involved in the development process;
- ✓ Organizing the inter-institutional partnership, an annual international conference devoted to the adaptation to climate change, that brings together experts from academia and research, government, and practitioners from public and private sector;

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- ✓ Organizing professional training courses in the field of climate change adaptation for education personnel, that will be later enabled as vectors of communication for students;
- ✓ Developing promotional materials for the strategy and action plan, and a video presentation that will be promoted online, on websites and Facebook pages of the institutions involved. The video will also run at the premises of some institutions and in some public areas;
- ✓ Conducting public media campaigns, aiming to warn the population on the periods of extreme weather;
- ✓ Concluding partnership agreements with local opinion leaders (NGOs, representatives of the owners associations, family doctors and school head teachers, spiritual leaders, etc.) to carry out information, public awareness campaigns;
- ✓ Organization of competitions for ideas and concrete measures to adapt to climate change among different categories of local stakeholders (eg. students, retirees, housing associations, companies, etc.);
- ✓ The local companies will adopt and maintain green spaces, playgrounds, public transport stations etc. in the city in exchange for the installation of billboards.

### 2.3.3 Monitoring & evaluation, review & improvement

This activity will identify a set of result and objective indicators to measure the progress in implementing the adaptation measures proposed in the action plan. The monitoring and evaluation provides clarifications on aspects that have to be monitored and evaluated, considering the time they should be implemented and helps to establish responsibilities for carrying out these activities. The following aspects should be clarified through discussions with the stakeholders in the partnership structures:

- ✓ What needs to be monitored and evaluated
- ✓ Time and frequency of monitoring
- ✓ Who is responsible for monitoring and evaluation
- ✓ Provision of the resources and commitment of those involved in this process

Monitoring activities will be carried out on the basis of the indicators proposed for this purpose. Thus, we can speak about at least two categories of indicators: result (short term) and objective (long term).

Result indicators:

- measure the progress of the actions and measures set
- indicate the results that are obtained after completing each type of project
- are the main indicators used in monitoring and ongoing evaluation of the Strategy and Action Plan

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Objective indicators:

- measure the progress of the sectoral objectives laid down
- are obtained after the completion of the strategic projects corresponding to each objective and are used in the evaluation performed at the end of the Strategy and Action Plan implementation (final evaluation).

Table 12. Example of monitoring indicators - Brasov, infrastructure and urbanism sector

Target indicators (at sectoral level)	Result indicators (per measure / project)
<b>Restricting the area of urban heat islands in Brașov</b>	<ul style="list-style-type: none"> <li>• No. of public buildings with green roofs</li> <li>• No. of buildings with green facades</li> <li>• No. of landscaped courtyards schools</li> <li>• No. of developed landscape studies</li> <li>• No. of parks equipped with irrigation facilities</li> <li>• No. of trees planted</li> <li>• No of folding pruning trees developed</li> <li>• No. of ZPs developed and approved</li> <li>• No. of ZPs grounding studies prepared</li> <li>• Area of slope fortification works</li> <li>• No. of beneficiaries of tax incentives</li> </ul>

The monitoring will be conducted by the Monitoring Committee (see section 2.1.2), which will develop monitoring reports regularly (annually or every two years) and will present them to the partners. These reports will present the progress made in implementing the strategy, taking into account the monitoring indicators established and will propose corrective measures, if there are any problems or delays. The monitoring will consider the activities (comparing the forecast to the effective duration and monitoring the achievement of interim results at different times), the results (checking the progress in achieving the indicators provided for activities and measures) and the resources (in terms of expenditure and funding).

The monitoring answers the following question: **Do we implement the strategy correctly?** If we find deviations from the route, we can take corrective actions in due time for the implementation of the present strategy (updating / upgrading strategy and action plan).

To summarize, the monitoring of the implementation of the Strategy and Action Plan can be run according to the following activities calendar:

- ✓ Monitoring the implementation of the local strategy, in the case of existing strategies: shall be developed in 2020, a year when the implementation of measures and actions provided in the strategy should end, reviewed, in order to select the the interventions proposed for 2030 or 2050 (the entire period covered by the vision). Basically, this monitoring action corresponds to a "stage" / intermediate strategy implementation assessment, given that it refers to three time horizons: short (2020), medium (2030) and long term (2050)

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- ✓ The results of the proposed monitoring (2020) will be centralized in a monitoring report. The main purpose of the monitoring report is to highlight the status of the strategy and to propose recommendations for effective implementation. It is recommended that to have a simple structure, including an introduction (with information about the period covered by the monitoring report, the sources of the data used for assessing the progress in implementing the strategy, difficulties encountered), a section that describes the monitoring activities undertaken chronologically and synthetically, a chapter that provides measures and actions that have been monitored and recommendations to streamline the implementation of each measure and action, and a final section that provides a synthetic view of the overall report on the progress made in implementing the strategy for the period 2016-2020;
- ✓ The monitoring report will be discussed in the plenum of the City Council to review the progress in implementing the strategy and identify recommendations for improving the implementation thereof;
- ✓ The City Hall, who will assume the strategic document by HCL, will have the task of documenting the value of the selected monitoring indicators, presented in the table below, based on secondary sources: statistical data provided by the National Institute of Statistics (eg. TEMPO Online database), own data, utility operators, other institutions etc. and also from the Annual Implementation / Progress Reports of the Operational Programmes from 2014-2020, drawn up by the Management Authorities / Intermediary Organisms (based on data from SMIS), given that some of the priority projects of strategy portfolio are proposed for funding from the Operational Programmes;
- ✓ If the information available at the existing sources of information are not sufficient to reflect the progress of the strategy implementation, monitoring questionnaires may be applied to the organizations that implement projects relevant to the strategy (see the people in charge / partners in the action plan);
- ✓ To ensure the representation of the stakeholders at local level, the continuity of the planning process and the success of the monitoring, we recommend, as mentioned above, the setting up of a Monitoring Committee of the strategy, to carry out the intermediary monitoring activities (eg. yearly or every two years) and to provide direct support to the City Hall representatives (eg. documenting the indicators for monitoring, establishing measures to streamline the implementation, identifying new projects, partners, funding sources, etc.) in the monitoring process which will be implemented by 2020;

Unlike monitoring, evaluation is a punctual activity which analyzes the implementation of the strategy strategy at a given moment: before the implementation phase (ex-ante), during implementation (interim evaluation) at the end of the implementation period (final evaluation) or a few years after implementation (ex-post) and is performed by external experts, who were not directly involved in drafting and implementing the strategy and action plan on the adaptation to climate change, so as to ensure objectivity.

The evaluation actions aim to determine the relevance and degree of achievement of the objectives, efficiency, effectiveness, impact and sustainability of the strategy, and it is supposed to answer the question: **Do we implement the right strategy?** It seeks and offers useful lessons for the documents updating and revision phase and enables strategic, major decisions, that concern the hereby strategy.

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Table 13. Tracking progress and effectiveness – example from the Changing Climate Guidelines, Changing Communities: Guide and Workbook for Municipal Climate Adaptation, ICLEI

<p><b>Progress in implementation</b></p> <p>These actions are implemented in accordance with the deadlines established in the Action Plan for Adaptation</p>	<p><b>Effectiveness of actions</b></p> <p>How do the actions contribute to increasing or maintaining the adaptability capacity of the sectors in the community? Do the individual actions produce the desired results?</p>
<p>How many actions have been taken by different departments? How many departments / How many employees of these departments were involved / engaged in the implementation of adaptation actions? How stakeholders were involved in developing and implementing the action plan on adaptation? Are the community partnerships functional to allow the decisions on adaptation planning? To what extent has increased the community capacity (general and technical) to prepare for climate change? How is considered climate information in the decision-making process in the community? How much support is provided by the government, community, stakeholders to prepare for climate change? How have the favourable conditions and barriers changed? Are there new opportunities that could help in the implementation of community actions, now and in the future?</p>	<p>Monitoring the analyzed indicators and updating the baseline value. How did the community conditions changed? How effective is used the technical capacity of the community to assess the risks and vulnerabilities? How effective were the measures in achieving the vision and goals of the community? Are there formal mechanisms in place to facilitate the planning of adaptation to climate change? If not, what prevented their development? What are the changes (increase) of the awareness of climate change and its expected effects on the community?</p>

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### 3. Best practices

We present below several strategies for urban climate adaptation used in EU cities, but also in the American continent, showing items that can be implemented in the cities of Romania, with the following aspects considered:

- ✓ The name of the strategy or action plan (including the link where you can download more information)
- ✓ Who coordinated the strategy and the main partners involved
- ✓ The vision (where available) and purpose set in the preparation process
- ✓ The main phases and stages
- ✓ The sectors analyzed
- ✓ The key challenges identified in terms of climate change impact
- ✓ The main objectives and measures proposed
- ✓ Other monitoring and evaluation aspects

<b>City, Country</b>	<b>Vienna, Austria</b>
<b>Strategy Title</b>	Program for climate protection of Vienna 2010-2020 ( <a href="http://www.wien.gv.at/english/environment/klip/pdf/klip2-short.pdf">www.wien.gv.at/english/environment/klip/pdf/klip2-short.pdf</a> )
<b>Coordinator and Partnership</b>	The Department for Climate Coordination of Vienna
<b>Partnership and Stakeholders</b>	<p>6 work groups: transport, urban planning, construction, tourism, healthcare and energy</p> <ul style="list-style-type: none"> <li>- Public institutions (public transport system, the energy company, departments and infrastructure construction, housing, urban planning, environmental protection, staff protection and occupational medicine, integration and diversity, hospitals association)</li> <li>- Private sector (insurance against hail, OMV, airport, railways)</li> <li>- NGOs (industry associations, chamber of commerce, labor office, World Wildlife Fund (WWF), Greenpeace, Global 2000 Caritas)</li> <li>- Research (BOKU University, Institute of Meteorology Agency for Energy)</li> <li>- Regional Government (Lower Austria)</li> </ul>

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<b>Vision / Purpose</b>	Reducing the emissions of greenhouse gases per capita by 21% compared to 1990, by 2020
<b>Phases / Stages</b>	Evaluation of the previous program Updating the analyzed information Update the analyzed sectors Identify measures to mitigate and adapt to climate change Setting the targets to be achieved by 2020
<b>Sectors</b>	Production and supply of energy, energy consumption, urban mobility and infrastructure, procurement, waste management, agriculture and forestry, nature conservation, public relations (information and awareness)
<b>Challenges</b>	River floods, drought and water efficiency, urban heatwaves / heating, damage caused by wind / storm, water quality, the increased number of health problems and diseases, loss of biodiversity, migration and social impact
<b>Objectives / Measures</b>	1. Renovation of housing for energy efficiency: waterproofing and insulation, control overheating 2. Urban planning: spatial planning to reduce the climate change impact and associated costs, ex. green spaces in courtyards, green roofs 3. Plan for securing the energy supply: reducing the need for fossil fuels while centralized cooling is performed using waste 4. Expanding public transport and reducing the travels using private cars
<b>Monitoring &amp; Evaluation</b>	Austrian Energy Agency Progress reports on program implementation, every 3 years

<b>City, Country</b>	<b>Copenhagen, Denmark</b>
<b>Strategy Title</b>	Copenhagen Climate Adaptation Plan ( <a href="http://en.klimatilpasning.dk/media/568851/copenhagen_adaption_plan.pdf">http://en.klimatilpasning.dk/media/568851/copenhagen_adaption_plan.pdf</a> )
<b>Coordinator and Partnership</b>	Copenhagen City – Technical and Environmental Department - landlords (citizens and business sector), - public utilities companies, - local politicians, - other municipalities, - land use planning authorities, - local strategic partnerships, ex. Partnership for Climate Adaptation and Innovation: research institutes (the Technical University of Denmark), public institutions and utilities companies, companies and professional

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	organizations
<b>Vision / Purpose</b>	Copenhagen - a safe and attractive city to live and spend your time in it
<b>Phases / Stages</b>	Outlining the challenges posed by climate change on short and medium term Identifying the optimal solutions based on current knowledge Discovering the opportunities provided by the climate change
<b>Sectors</b>	Healthcare, flood management and coastal zone management, water resources management, protection of green spaces, urban and regional planning, building and construction, regional / local economics, tourism and recreational activities, emergency planning, finance and insurance
<b>Challenges</b>	Rising sea levels, more frequent and more intense rainfall, floods, high temperature / heat island effect, changing groundwater levels
<b>Objectives / Measures</b>	Sewer system expansion and establishment of sustainable drainage system: increasing the channels capacity, rainwater storage tanks, underground tanks and pumping stations "Green and blue" elements in the city: new green areas, planting trees, green roofs and facades, small parks, gardens, lakes and streams
<b>Monitoring &amp; Evaluation</b>	The City Hall will monitor the projects proposed and the degree of implementation and their consequences and evaluate the need, for example, for informative and preventive measures

<b>City, Country</b>	<b>Helsinki, Finland</b>
<b>Strategy Title</b>	Helsinki Metropolitan Area Climate Change Adaptation Strategy ( <a href="https://www.hsy.fi/sites/Esitteet/EsitteetKatalogi/Julkaisusarja/11_2012_Helsinki_Metropolitan_Area_Climate_Change_Adaptation_Strategy.pdf">https://www.hsy.fi/sites/Esitteet/EsitteetKatalogi/Julkaisusarja/11_2012_Helsinki_Metropolitan_Area_Climate_Change_Adaptation_Strategy.pdf</a> )
<b>Coordinator and Partnership</b>	The Environmental Services Regional Authority - Helsinki City and other and towns in the metropolitan area (chief architect, chief environmental center, urbanist chief, builder chief, building control department, director of the environmental research center, director of public safety, technical services director and family service director, emergency department, director of water services) - Center for regional and environmental information - Helsinki Metropolitan Area Council - Urban and regional research center

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	<ul style="list-style-type: none"> <li>- Ministry of the Environment</li> <li>- Interior Ministry</li> <li>- Regional authority for environmental services</li> <li>- The regional transport authority</li> </ul>
<b>Vision / Purpose</b>	Helsinki is an environmentally friendly metropolis, where mitigation and adaptation to climate change are key. The metropolitan area will act as a pioneer responsible for the environment, in cooperation with the municipalities in the region, not only in the field of waste and water management, air quality and geographic information, but also in other climate related activities
<b>Phases / Stages</b>	<p>Strategic starting points and policy guidelines</p> <p>The framework for developing policies for the period 2012-2020 (analysis of the following areas: land use, transportation and utilities networks, construction and local environment adapted to the climate, water and waste management, emergency and safety, health and social services, cooperation for manufacturing and information dissemination)</p> <p>The impact assessment</p> <p>Monitoring and updating</p>
<b>Sectors</b>	Cross-sector strategy: flood management and coastal zone management, water management, waste management, urban and regional planning, building and construction, transport
<b>Challenges</b>	Rising sea levels, intense precipitation, drainage and flash flooding, damage caused by wind / storms, heat waves / urban heat islands, increasing the number of health problems and diseases, migration and social impact
<b>Objectives / Measures</b>	<p>Consideration of climate variation impact, extreme weather events and climate change in land use planning</p> <p>Streamlining the services considering the ecosystems and biodiversity conservation through the development of green belts networks</p> <p>Taking into account the major risks arising from extreme weather events, rising sea levels and climate change in public transport planning, transport networks and other utility networks. Providing emergency traffic management</p> <p>The development of transport services on call and ensure the information in real time through various channels using the Transport Information Center</p> <p>Participation in research projects on sea level rise scenarios and their occurrence probability</p> <p>Checking the minimum height of buildings based on the current scenarios and guidelines for sea level rise</p> <p>The water resource management and waste planning must consider the problems caused by extreme weather conditions</p>

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	<p>Reducing water overflows from mixed sewers          Checking the size of water treatment plants in conjunction with extreme weather events and climate change          The introduction of preparatory actions in the action plan on risk management          Rescue services shall be informed in real time about the collaboration with different organizations and resources that could be used in case of blockages caused by weather phenomena          Study of groups vulnerable to climate change and identification of their needs in case of emergency          Preparing citizens to cope with climate change and extreme weather events (survival guide, annual events and communication through social media)          Creating a network for researchers in the field of climate change and other users in order to disseminate the latest information on research in this area          Studying the best practices and experiences on adaptation to climate change, including through participation in national and regional networks, and dissemination among stakeholders          Developing the tools for adaptation to climate change to be used in urban planning and the study of the associated costs of adaptation          Participation in projects that assess the impact of climate change on the health of plants, animals and humans and their economic impact          Participation in projects that study the impact of climate change on air quality and health, including forest fires and particulate emissions</p>
<p><b>Monitoring &amp; Evaluation</b></p>	<p>Monitoring the implementation of approved policies and tracking the changes occurred in the work environment. If necessary, the measures are updated in cooperation with various actors          Selection and compilation of indicators for monitoring          Reporting on the implementation of adaptation actions in the region and potential modifications occurred (in the legislation, the actions of other actors, guidelines)          Tracking the latest information on climate research by using the partnership networks of researchers and other actors          Assess the policy effectiveness in reducing vulnerability          Dissemination and transmission of information through various channels</p>

<p><b>City, Country</b></p>	<p><b>Vancouver, Canada</b></p>
<p><b>Strategy Title</b></p>	<p>Climate change adaptation strategy, city of Vancouver, Greenest City 2020 (<a href="http://vancouver.ca/files/cov/Vancouver-Climate-Change-Adaptation-Strategy-2012-11-07.pdf">http://vancouver.ca/files/cov/Vancouver-Climate-Change-Adaptation-Strategy-2012-11-07.pdf</a>)</p>

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<b>Coordinator and Partnership</b>	<p>City Deputy Manager / Deputy Mayor</p> <ul style="list-style-type: none"> <li>- City Engineer</li> <li>- Sustainability Group</li> <li>- Adaptation to climate change team (cross-department)</li> <li>- Sectoral working groups</li> <li>- Monitoring committee</li> </ul>
<b>Vision / Purpose</b>	<p>Vancouver will remain a living, resilient, city, that preserves its values, character and charm in front of climate change</p> <ul style="list-style-type: none"> <li>- Increasing the resilience of the city's infrastructure, programs and services to the anticipated impact of climate change</li> <li>- Promoting and facilitating the integration of information on climate change in the City Hall activities</li> <li>- Improving awareness, knowledge, skills and resources of City Hall's staff</li> <li>- Increasing opportunities for coordination and cooperation by developing networks and partnerships</li> </ul>
<b>Phases / Stages</b>	<p>What is the anticipated climate change? What are the major impact? What actions we do to meet the challenges? Implementation Monitoring and updating</p> <ul style="list-style-type: none"> <li>- Interviews and actions related impact</li> <li>- Research on expected changes to climatic variables (rain, wind, temperature)</li> <li>- Review of policies, programs, plans and existing regulations to identify opportunities and adaptation actions</li> <li>- Assessment of risks and vulnerabilities (from 80 impacts we have reached to 20 key impacts)</li> <li>- Identification and prioritization of adaptation actions (criteria used: benefits from mitigation actions, equity, implementation cost, robustness, emergency, ancillary benefits, opportunity, financial resources, institutional control)</li> </ul>
<b>Sectors</b>	<p>Infrastructure (sewerage, construction and buildings, energy, transport, water, telecommunications), health and welfare, habitat, parks, green spaces, economics, coastal zone</p>
<b>Challenges</b>	<p>Flooding due to sea level rise Flooding due to increased frequency and intensity of precipitation Damage due to increased intensity and frequency of storms and winds</p>

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<p><b>Objectives / Measures</b></p>	<p>The health impact because there are more days of extreme temperatures and heat waves</p> <p>O1.1. Minimizing the flooding associated to rains and their consequences (completion and implementation of an integrated management plan for storm water throughout the city, the separation of the storm sewer network)</p> <p>O2.1. Increasing the resilience of infrastructure and property from coastal flooding and erosion (completing of the assessment of flood risk in coastal areas and developing an adaptation plan in response to sea level rise, updating flood protection policies, including the of flood protection construction height)</p> <p>O3.1. Reducing the risks to the safety and health of homeless people and those on low incomes due to adverse weather conditions</p> <p>O3.2. Increasing the capacity of the city to respond to extreme weather events and to recover effectively (drafting a policy on energy reserves and assessing the shortcomings of departments)</p> <p>O4.1. Minimizing the morbidity and mortality during heatwaves (supporting the committee for extreme heat, complementing the program planning and preparation for extreme heat expansion)</p> <p>O4.2. Decreasing the water consumption per capita (water conservation)</p> <p>O5.1. Increasing the resilience of the built environment to future climate conditions (to include climate change adaptation measures in the revised regulation on building and exploring the changes in the targeted areas)</p> <p>O5.2. The long-term growth of health and vitality of urban forests, green spaces and trees (supporting the development of a comprehensive management plan for the urban forest, which focuses on the successful growth of trees in urban areas)</p> <p>O6.1. Integration the considerations on adapting the actions of all city departments</p>
<p><b>Monitoring &amp; Evaluation</b></p>	<p>Monitoring indicators</p> <p>O1.1 .: number and cost of claims related to damage caused by floods; the number of combined sewers; permeable surfaces percentage of total land</p> <p>O2.1 .: number of people living in unprotected, flood-prone coastal areas; the value of assets located in unprotected coastal areas prone to flooding; changes in salinity groundwater</p> <p>O3.1 .: weight of excess beds in shelters for periods of extreme weather conditions; the annual number of requests for shelter during the periods of extreme weather conditions; mould number of cases reported in the online information on rents</p> <p>O3.2 .: total loss amount (in dollars) incurred by the municipality due to weather events; the number of requests related to weather events to emergency weather stations; the share of municipal utilities that have reserves of energy to remain functional and comply with safety requirements for citizens</p>

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04.1 .: hospitalizations / deaths due to heat; capacity of cooling centers; the average distance from areas with high temperature / location of population centers vulnerable to cooling; average temperature recorded in areas with high temperatures; share of shaded areas (canopy); the number of new wells in areas with high temperatures  
04.2 .: water consumption per capita; the number of initiatives to use wastewater  
05.1 .: share of building permits with LEED certification (Leadership in Energy and Environmental Design); share of buildings with green or cold roofs  
05.2.: the ratio between the surface covered with trees and the total area of the city; increase / decrease in the average surface of green spaces and trees; average proximity of residents to natural areas  
06.1 .: number of public-private partnerships in the field of climate; number of projects or adaptation actions implemented annually; the number of people aware of climate projections  
The assessment is made annually  
Update is done every 5 years

City, Country	Melbourne, Australia
<b>Strategy Title</b>	City of Melbourne Climate Change Adaptation Strategy ( <a href="http://www.deltacities.com/documents/melbourne_climate_change_adaptation_strategy.pdf">www.deltacities.com/documents/melbourne_climate_change_adaptation_strategy.pdf</a> )
<b>Coordinator and Partnership</b>	City Hall Representatives of the analyzed sectors (utilities companies, department of human services / healthy eating, food merchants, businesses, chamber of commerce and industry, associations Monitoring Committee of the Council
<b>Vision / Purpose</b>	Reducing the likelihood and consequences of risks or increase their control
<b>Phases / Stages</b>	Risk identification Risk evaluation Action Plan for Adaptation - Establish context - Identify risks - Risk Analysis - Risk evaluation - Risk settlement (adaptation)

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	- Monitoring and review - Transversal: communication and consultation
<b>Sectors</b>	Water, transport and mobility, construction and property, social, health and community, business and industry, energy and telecommunications, emergency services
<b>Challenges</b>	Reducing rainfall and drought Waves of extreme heat and fires Intense rainfall and storms Sea level rise
<b>Objectives / Measures</b>	Increasing the collection and reuse of water from storms (helps both in situations of flash flooding and the water supply when this is in insufficient quantities and and to reduce the pressure on the sewerage system during periods of heavy rain; there are two initiatives: Water savings initiatives map and Total watermark - City as a catchment) Increasing the efficiency of passive cooling to reduce the heat island effect (reducing the temperature in buildings and street level) Developing and implementing an action plan to respond to heat waves (more detailed analysis of the profile of those at risk, in order to provide them help during periods of extreme temperatures (extreme heat) and finding communication channels suitable to reach them; reviewing the protocols on events related to high temperature conditions; develop a warning system for heat waves, in order to mobilize resources and to respond effectively to these events; education and development of the adaptation capacity of the community) Active planning to control the consequences of rising sea levels (modelling the impact of rising sea levels and ensuring that planning in vulnerable areas is suitable for such future conditions) Development of more sophisticated communication and warning systems (able to reach people, companies and organizations and support the development of a culture that ensures the natural and automatic response to risks that are well understood)
<b>Monitoring &amp; Evaluation</b>	Due to the uncertainty about the future climate change, it is recommended to update and continuously adjust the risk according to the changes occurred in the projections, to develop control measures (by the city or other stakeholders) in response to climate change and other socio-economic pressures. Risks and adaptation measures should be reviewed so as to ensure that they remain appropriate to the changing situation. The City Hall must take over the coordinator role of the municipality in terms of responding to climate change and ensure a clear assignment of responsibilities among the partners.

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**Table 14. Addressing climate change in Norway**

- Adaptation is primarily a governmental responsibility and the Government provides the guidelines for planning.
- At the same time, municipalities must ensure strong and sustainable communities in the future. Therefore, it is necessary that aspects of climate change become an integral part of the responsibilities of municipalities.
- Businesses and residents are affected by climate change and can bring significant contributions to the society's general adaptation
- It is now clear that that getting a green stamp or green business label offers competitive advantages
- The adaptation process has an integrated approach: adaptation must be integrated into the regular planning processes and the law; adaptation should be applied, as far as possible, by processes that occur anyway
- Municipalities are small, and the knowledge and skills at their level are reduced. Specialists in the field are not available in general, at the municipality level. Therefore, we consider that the practical work of planning is a task for general practitioners (employees who are knowledgeable in a wide range of subjects)
- Adaptation is planning under uncertainty: we know the direction / trend, but the exact quantity is unknown (how many degrees, how many millimetres, etc.)
- Even if municipalities have limited responsibilities and tools in a particular area, they can still play an important role in influencing other players and become the "engine" of the process
- The assessment of the risk and vulnerability should focus on how climate change affects critical infrastructure and essential functions of the society. There must be analyzed how those who are responsible for critical infrastructure are able to provide the services that are essential to the society, even during an event of climate change (climate pressure)
- In accordance with the precautionary principle, the Government recommends that the adaptation of the society to climate change should be based on the pessimistic scenario (worst case scenario)

Source: Haavard Stensvand, Head of Emergency Planning, County Governor of Sogn og Fjordane

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## Conclusions and recommendations

The principles underlying the development of a good strategy for adaptation to climate change:

- ✓ involving the relevant stakeholders
- ✓ understanding the risks and barriers
- ✓ defining smart objectives and results and communicating them
- ✓ managing the climate and non-climate risk in a balanced approach, integrating the adaptation measures into existing programs and policies (taking into account the context provided by the general development objectives)
- ✓ focusing on priority climate risk management actions, sector focus
- ✓ addressing the prioritized risks associated with current climate variability and extremes
- ✓ using a flexible management to cope with uncertainties
- ✓ recognizing the importance of no-regret / low-regret and win-win adaptation options in terms of cost effectiveness and multiple benefits
- ✓ ongoing review of the effectiveness of adaptation decisions by monitoring and re-evaluation of risk
- ✓ ongoing process, and the documents to be reviewed and updated to take into account the new developments in the field (science, research, technology)
- ✓ effective communication and awareness

As limits to a successful adaptation, we can mention:

- ✓ lack of human and financial resources
- ✓ lack of involvement and political ownership
- ✓ lack of specific research
- ✓ communicating relevant information to decision makers
- ✓ ensuring a common understanding of adaptation among all stakeholders

As seen in the previous chapters, the main stages in developing the strategies and action plans for adaptation to climate change are: establishing the framework for coordination and partnership, planning the activities, analysis of existing situation (identification of challenges / risks, vulnerabilities and opportunities), identification of vulnerable sectors, defining, evaluating and selecting the alternatives, development of the action plan, selection of the implementation and monitoring system, selection of the communication mechanism, updating the document.

As recommendations drawn from both the pilot strategies that have been developed for the cities of Sibiu, Brasov and Tg. Mures and from the good practices we analyzed, we can mention:

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- ✓ The measures on adaptation to climate change in all areas of action should observe the principle of sustainable development, so as to ensure a balance between social, economic and ethical context
- ✓ The capacity to adapt and empower individuals in this area must be improved and maintained through programs and initiatives at national and regional level
- ✓ The involvement of stakeholders and understanding their perspectives is a critical point in the decision-making process. The personal and organizational interests will influence decisions and how they are implemented
- ✓ Moreover, the decision-making process must take into account the time needed for the implementation of decisions, as this term influences the type of information required and the level of uncertainty that should be considered (it increases with the lifetime of targeted interventions)
- ✓ The risks and vulnerabilities, evaluation, implementation and refinement of alternatives must be continuously explored
- ✓ The social aspects and consequences of climate change and adaptation measures must be integrated into the implementation of existing programs and initiatives
- ✓ The promotion measures should be doubled or be designed to double the measures that mitigate the effects of climate change, producing a greater long-term impact
- ✓ The research on the consequences of climate change and adaptation measures should be promoted to the general public
- ✓ The adaptation must be specific and relevant. For example, during the planning and implementation of adaptation alternatives (especially in areas such as health, construction and housing, energy, spatial planning, transport infrastructure and public spaces and green areas) the differences between the needs of various generations and the demographic changes should be taken into account. Health condition also influence the extent to which people can cope with climate change and how to adapt. Therefore, these differences should be taken into account when determining the adaptation measures
- ✓ During the selection and design of adaptation measures, a special attention should be given to the vulnerable groups. Also, there should be selected the appropriate measures that can be implemented without bringing an additional burden to the work force
- ✓ In order to obtain at the end of the process a climate-resilient community, we must increase the public awareness of climate change topic and the projected impact on the community; to increase the technical capacity to prepare for impact, to explain the information about the vulnerabilities, risks and level of preparedness, the planning and investment decisions; to increase the adaptability of built-up, natural and human systems and to strengthen the partnerships in the community that can help reduce vulnerabilities and risks
- ✓ After preparing these documents, they should be submitted for approval to the City Council, so as to bring them legitimacy
- ✓ All the action areas should have measures of communication and education, targeting all age groups, all backgrounds, at all administrative levels. These measures should be tailored to the target group and should highlight the responsibility that each individual has regarding climate change

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- ✓ It is important to measure the progress throughout the entire implementation period; to regularly review the assumptions regarding the vulnerabilities, risks, targets; to ensure regular updating of actions and to disseminate the lessons learned and knowledge acquired to other communities with circumstances similar to the territory concerned

## References

Center for Sciences in the Earth System, Joint Institute of the Atmosphere and Ocean, University of Washington, Preparing for Climate Change. A Guidebook for Local, Regional, and State Governments, 2007 ([iclei.usa.org/wp-content/uploads/2015/08/PreparingForClimateChange\\_Sept2007.pdf](http://iclei.usa.org/wp-content/uploads/2015/08/PreparingForClimateChange_Sept2007.pdf))

Climate Adaptation Services foundation, Guide to spatial adaptation (<http://www.ruimtelijkeadaptatie.nl/en/>)

Cuadernos de trabajo UDALSAREA21, Guia para la elaboracion de programas municipales de adaptation al cambio climatico, Nr. 12/2011 (<http://www.adaptecca.es>)

Ecological Institute, Berlin, AEA group, ICLEI – Local Governments for Sustainability, European Secretariat, the Regional Environmental Center for Central and Eastern Europe, Adaptation to Climate Change. Policy instruments for adaptation to climate change in big European cities and metropolitan areas (<http://cor.europa.eu/en/documentation/studies/Documents/Adaptation-to-Climate-Change/EN.pdf>)

European Commission, Working document 137, Adapting infrastructure to climate change, 2013 ([http://ec.europa.eu/clima/policies/adaptation/what/docs/swd\\_2013\\_137\\_en.pdf](http://ec.europa.eu/clima/policies/adaptation/what/docs/swd_2013_137_en.pdf))

European Commission, Working document 134, Guidelines on the development of adaptation strategies, 2013

European Environment Agency, Adaptation in Europe. Addressing risks and opportunities from climate change in the context of socio-economic developments, Report No.3 / 2013 ([www.eea.europa.eu/publications/adaptation-in-europe/at\\_download/file](http://www.eea.europa.eu/publications/adaptation-in-europe/at_download/file))

Giordano, F., Capriolo, A., Mascolo, R.A. (coord), Planning for adaptation to climate change. Guidelines for municipalities, Life project No LIFE08 ENV/IT/000436 (<http://base-adaptation.eu/sites/default/files/306-guidelinesversionefinale20.pdf>)

ICLEI Local Governments for Sustainability, Changing Climate, Changing Communities: Guide and Workbook for Municipal Climate Adaptation ([http://www.icleicanada.org/images/icleicanada/pdfs/GuideWorkbookInfoAnnexes\\_WebsteCombo.pdf](http://www.icleicanada.org/images/icleicanada/pdfs/GuideWorkbookInfoAnnexes_WebsteCombo.pdf))

Local Government Association of South Australia, Climate adaptation planning guidelines (<https://www.lga.sa.gov.au/webdata/resources/files/LGA%20CAPG%20Final%20Print%20Version.pdf>)

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Granturilor SEE 2009 - 2014

Ministerul dezvoltării regionale și administrației publice, Ghid privind dezvoltarea și implementarea de politici urbane integrate, 2015 ([www.dezvoltareurbanaintegrata.ro](http://www.dezvoltareurbanaintegrata.ro))

Norwegian Ministry of Climate and Environment, White book - Climate change adaptation in Norway, 2015 (<https://www.regjeringen.no/en/dokumenter/meld.-st.-33-20122013/id725930/>)

Prutsch, A., Felderer, A., Balas, M., Konig, M., Clar, C., Steurer, R., Methods and Tools for Adaptation to Climate Change. A Handbook for Provinces, Regions and Cities, 2014 (<http://www.klimawandelanpassung.at/ms/klimawandelanpassung/en/>)

UK Climate Impacts Programme (UKCIP - [www.ukcip.org.uk](http://www.ukcip.org.uk))

\*\*\* City of Melbourne Climate Change Adaptation Strategy ([www.deltacities.com/documents/melbourne\\_climate\\_change\\_adaptation\\_strategy.pdf](http://www.deltacities.com/documents/melbourne_climate_change_adaptation_strategy.pdf))

\*\*\* Climate change adaptation strategy, Greenest City 2020 (<http://vancouver.ca/files/cov/Vancouver-Climate-Change-Adaptation-Strategy-2012-11-07.pdf>)

\*\*\* Copenhagen Adaptation Plan to Climate Change ([http://en.klimatilpasning.dk/media/568851/copenhagen\\_adaption\\_plan.pdf](http://en.klimatilpasning.dk/media/568851/copenhagen_adaption_plan.pdf))

\*\*\* Climate protection programme of Vienna 2010-2020 ([www.wien.gv.at/english/environment/klip/pdf/klip2-short.pdf](http://www.wien.gv.at/english/environment/klip/pdf/klip2-short.pdf))

\*\*\* Helsinki Metropolitan Area Climate Change Adaptation Strategy ([https://www.hsy.fi/sites/Esitteet/EsitteetKatalogi/Julkaisusarja/11\\_2012\\_Helsinki\\_Metropolitan\\_Area\\_Climate\\_Change\\_Adaptation\\_Strategy.pdf](https://www.hsy.fi/sites/Esitteet/EsitteetKatalogi/Julkaisusarja/11_2012_Helsinki_Metropolitan_Area_Climate_Change_Adaptation_Strategy.pdf))

\*\*\* The Austrian Strategy for Adaptation to Climate Change ([https://www.bmlfuw.gv.at/dam/jcr:f2e2e558-f714-4676-8768-e9b4d32be6a4/AustrianAdaptationStrategy\\_Context\\_FINAL\\_25092013\\_v02\\_online.pdf](https://www.bmlfuw.gv.at/dam/jcr:f2e2e558-f714-4676-8768-e9b4d32be6a4/AustrianAdaptationStrategy_Context_FINAL_25092013_v02_online.pdf))

### **Networks of cities for climate actions**

C40 Cities Climate Leadership Group - <http://www.c40.org/>

ICLEI-Local Governments for Sustainability - [www.iclei.org/](http://www.iclei.org/)

United Cities Local Governments (UCLG/Metropolis) - <https://www.uclg.org/>

World Mayors Council on Climate Change (WMCCC) -  
<http://www.worldmayorscouncil.org/>

CLIMATE-ADAPT (Europe) - <http://climate-adapt.eea.europa.eu>

Climate Alliance (Europe) - <http://www.climatealliance.org>

Covenant of Mayors (European Commission) - <http://www.covenantofmayors.eu>

EUROCITIES - <http://www.eurocities.eu/eurocities/case-studies-list&sector=envi>

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## Annex 1. Examples of sector risks and vulnerabilities

Sector	Risks/vulnerabilities
<b>Agriculture</b>	<ul style="list-style-type: none"> <li>- Affecting the agricultural production / Decrease in the farming resources due to extreme weather conditions (drying during drought periods, damage occurring during the abundant rains period – excess humidity)</li> <li>- More often vegetation fires during the drought periods</li> <li>- Activation of landslides in case of abundant precipitation following the non-cultivation of some land plots (permanent plantations, old / abandoned fruit tree plantations)</li> <li>- Degradation of lands by erosion due to the reduced areas of vineyards and orchards</li> <li>- Degradation and depletion of the soil nutrients due to the drought periods, but also due to excess humidity periods</li> <li>- Change in the feeding habits of wild species that impact agriculture</li> </ul>
<b>Forestry</b>	<ul style="list-style-type: none"> <li>- The occurrence of forest fires due to higher temperatures, rainfall and scarcity of strong winds</li> <li>- The decrease of forest productivity and diversity of forests and changes in the growing season as a result of increasing temperatures, droughts, heavy snowfall, insects and parasites, and deficiencies in implementation of forestry works</li> <li>- Activation of unstable slopes that have been cleared of forest vegetation and the increased soil degradation phenomena due to the linear erosion and depth</li> <li>- Emphasizing the torrential, ravines and compaction phenomena due to the existence of wagon and tractor roads through the forest</li> <li>- Increased effects of climate change on the population, due to the lack of green rings, suburban rings, shelterbelts</li> <li>- The presence of excess moisture and its increased impact on the floodplains of rivers due to the lack of water meadows</li> </ul>
<b>Water resources</b>	<ul style="list-style-type: none"> <li>- The occurrence and persistence of excess moisture meadows and alluvial plains where there are swamps and marshy meadows</li> <li>- The occurrence of flooding in areas vulnerable to floods</li> <li>- Enabling landslides of unstable slopes during periods of heavy rainfall, due to the existence of untapped coastal springs</li> <li>- Stagnation of rainwater flooding the streets and their temporary extension amid low divider sewerage, sewage system worn and outdated and undersized for downloading cumulative volumes of household and storm wastewater</li> <li>- Uncontrolled drinking water supply and water and soil pollution due to the existence of households not connected to the centralized water supply and sanitation</li> <li>- Decrease of groundwater as a result of drought and high consumption of water for garden irrigating gardens</li> <li>- Failure of preserving the ecological flow of the watercourses during periods of drought as a result of upstream water works</li> </ul>

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	<p><i>carried out</i></p> <ul style="list-style-type: none"> <li>- <i>Pollution of water bodies and courses due to discharge of untreated wastewater, uncontrolled waste storage, improper arrangement of banks</i></li> <li>- <i>Decreased oxygen level in the water due to high temperatures</i></li> </ul>
<b>Biodiversity</b>	<ul style="list-style-type: none"> <li>- <i>Some of the natural areas of particular value do not have the status of protected area</i></li> <li>- <i>The lack of delimitation of areas for observation and marked trails in protected areas</i></li> <li>- <i>The lack of bridges and green bridges for animals</i></li> <li>- <i>Impairment of flora and fauna that are not properly protected and preserved in situ and are subject to extreme weather events</i></li> <li>- <i>Pollution / destruction of wetlands that are habitats for seabirds species</i></li> <li>- <i>The proliferation of invasive species</i></li> <li>- <i>Changing the feeding behavior of wildlife and their penetration in urban areas</i></li> </ul>
<b>Energy</b>	<ul style="list-style-type: none"> <li>- <i>The rising cost of home heating, with the abolition of centralized heating systems and installing heating on natural gas</i></li> <li>- <i>A high percentage of homes that are not rehabilitated (and generate CO<sub>2</sub>) and are made of energy inefficient building materials, with roofs framing</i></li> <li>- <i>Increased consumption of electricity and natural gas of public buildings and the low number of public buildings that have received energy efficiency works</i></li> <li>- <i>An important part of the distribution network for electricity and communications is aerial, leading to power cuts and discontinuity of electricity supplies and communications services during certain weather conditions (eg. storms)</i></li> <li>- <i>Discontinuity or low pressure in pipelines which transport natural gas during cold season</i></li> <li>- <i>The rising cost of electricity consumed by public lighting system, due to its low energy efficiency</i></li> <li>- <i>Energy price increase in dry years amid falling share of hydropower at the expense of thermal energy (more expensive)</i></li> </ul>
<b>Industry</b>	<ul style="list-style-type: none"> <li>- <i>Energy price increase in dry years, while increasing CO<sub>2</sub> emissions, but also the cost of industrial</i></li> <li>- <i>Increasing price of raw materials and agricultural production in dry years and low quality productions</i></li> <li>- <i>Increasing energy costs during hot and cold periods due to the air conditioning / heating systems, including the increased spending on health protection of staff</i></li> <li>- <i>Restrictions on heavy transport on certain roads during periods of extreme weather (this mostly affect the exporting companies)</i></li> <li>- <i>Reduction of activity within the construction industry and</i></li> </ul>

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<p><b>Transport</b></p>	<p>construction materials during extreme weather events</p> <ul style="list-style-type: none"> <li>- Food spoilage amid high temperatures</li> <li>- Delayed emergency interventions of specialized crews and increased urban heat islands due to congestion and the lack of a traffic management system</li> <li>- Impairing traffic due to the lack of bypasses, of overdraft facility, park &amp; ride and intermodal terminals, the existence of street profiles with improper configuration, the existence of intersections dysfunction, scarcity of parking spaces and parking illegally side streets, insufficient capacity of public transport at peak hours, lack of dedicated lanes</li> <li>- Reduced accessibility in extreme weather conditions (eg. landslides and rock falling, heavy deposits of snow)</li> <li>- Discontinued of rail traffic during periods of extreme temperatures</li> <li>- Discontinued air traffic and damage to aircrafts and air infrastructure on the background of increasingly frequent phenomenon of fog, big temperature differences between the summer and winter, strong winds, heavy rains, storms and frost</li> <li>- Deformation and cracking roadway and sidewalks due to big differences in temperature, and the use of technologies not adapted to weather conditions</li> <li>- Impairment of transport infrastructure by the phenomena of land degradation</li> <li>- Impairment of communication paths due to extreme weather conditions that are not prevented by protective forest</li> <li>- The collapse of trees and electricity poles and aerial communications networks caused by storms</li> <li>- Temporary flooding of streets during the periods of heavy rain (possible causes: underestimating and clogging of sewage system, centralized unitary system, no separated sewage system, lack of rainwater harvesting tanks, paved sidewalks)</li> <li>- Health impairment of passengers using means of transport that do not have air-conditioning and heating systems in</li> </ul>
<p><b>Tourism and leisure</b></p>	<ul style="list-style-type: none"> <li>- Amplifying the effects of the heat felt by the population as a result of improper or failure to arrange the wetlands and watercourses with potential for leisure activities</li> <li>- Endangering the habitats hosted by forests, which are used improperly as recreational areas and picnic</li> <li>- Lack of integration of green areas into green corridors accompanied by pedestrian paths and bicycle and roller paths</li> <li>- Reducing the attractiveness of tourist resorts due to shortened tourist season, due to snowfalls and increased temperatures, and low flexibility of operators in the field and less diversified range of tourism products and services</li> <li>- Seasonal tourist traffic (including health and safety of tourists) are influenced by the impact of extreme weather conditions on transport and infrastructure, but also on the nature</li> </ul>

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	<ul style="list-style-type: none"> <li>- <i>Drying vegetation in parks and squares, as the plants are not adapted to environmental conditions and pollution, especially in periods of drought (no irrigation systems for extensive green areas)</i></li> </ul>
<p><b>Public health</b></p>	<ul style="list-style-type: none"> <li>- <i>Acute exacerbation of chronic disease during periods of extreme temperatures (heat, cold) and thermal stress caused by heat waves and UV exposure (increase in winter deaths, especially among the elderly)</i></li> <li>- <i>Increased number of calls for ambulance services, beyond their limited capacity</i></li> <li>- <i>The emergence of water stress during the hot season, due to decreased precipitation and drought</i></li> <li>- <i>The occurrence of infectious diseases specific to tropical areas and the development of pathogens and bacteria, due to hotter summers warmer winters</i></li> <li>- <i>Spreading of epidemics due to lower adaptability of the population (children, elderly, sick people) to sudden temperature changes</i></li> <li>- <i>Alteration of food during periods of hot weather, especially in the case of street commerce</i></li> <li>- <i>Increased number of deaths during the winter, due to the limited capacity of hosting the homeless</i></li> <li>- <i>Overuse of public health infrastructure in cases of emergency</i></li> </ul>
<p><b>Infrastructure and town planning</b></p>	<ul style="list-style-type: none"> <li>- <i>The emergence and expansion of urban heat islands due to: increased area occupied by constructions at the expense of the free (agricultural, green) areas, high density of housing, extensive areas of polluted industrial sites / abandoned large areas of asphalt / concrete</i></li> <li>- <i>Vegetation is drying in the green areas during the summer due to the lack of irrigation facilities</i></li> <li>- <i>Damaged buildings are affected by extreme weather conditions</i></li> <li>- <i>Activation of unstable slopes in built-up areas due to heavy rainfall</i></li> <li>- <i>Flooding of streets and built-up areas during periods of heavy rainfall due to the combined sewage system that is undersized, outdated and due to reduced areas of permeable paving</i></li> <li>- <i>More frequent phenomena associated with climate change, due to the scarcity of protective curtain of communication paths and industrial areas, and the lack of green belts</i></li> <li>- <i>Increased impact of urban heat islands due to the lack of town planning regulations on green roofs, the use of reflective colors, thermal rehabilitation of buildings, increasing green areas, etc.</i></li> </ul>
<p><b>Insurance</b></p>	<ul style="list-style-type: none"> <li>- <i>The damage caused by extreme weather is supported only by the owners of the buildings due to the low level of insurance coverage against natural disasters</i></li> <li>- <i>Cashing insurance policies in case of natural disasters, because of low capitalization of insurance companies to provide compensation</i></li> </ul>

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	<ul style="list-style-type: none"> <li>- Some properties are not covered by insurance (homes located in flood plains, built without planning permission and without fire prevention and extinction permit)</li> <li>- Failure to insure the drought risk by the insurance companies in Romania</li> <li>- Lack of mutual funds that manage the risk in agriculture and that provide compensation to farmers affected by extreme weather</li> </ul>
<b>Education, Information and Awareness</b>	<ul style="list-style-type: none"> <li>- Poor information, education and awareness on climate change and its local effects</li> <li>- Inappropriate behavior of citizens, not focusing the mitigation and adaptation to climate change</li> <li>- Lack of educational programs designed to train specialists in climate change adaptation</li> <li>- Insufficient applicative research and technology transfer between academia, the public and the private sectors in the field of environmentally friendly technologies and adaptation to climate change</li> </ul>

## Annex 2. Examples of opportunities / actions

Sector	Oportunities / actions
<b>Agriculture</b>	<ul style="list-style-type: none"> <li>- Reorientation of farmers to varieties / hybrids with high tolerance to high temperatures and heat stress</li> <li>- Use of crops adapted to marshy ground</li> <li>- Promoting organic farming</li> <li>- Favorable weather conditions for greenhouse crops</li> <li>- Involving the RDI activities in areas such as crop production, animal husbandry, horticulture and viticulture, ecology, mountain economy and tourism, to assess the water requirements of major crops and adaptation technologies and varieties to the present conditions</li> <li>- Supporting the establishment and operation of the associations of producers</li> <li>- Modernization of agricultural holdings in order to implement technologies adapted to climate change</li> <li>- Using erosion mitigation, drainage and irrigation works to achieve optimum operation through regular and emergency repairs (financed by the state budget and grants)</li> </ul>
<b>Forestry</b>	<ul style="list-style-type: none"> <li>- Compliance with the provisions of forestry policies and the forestry management plans for a sustainable use of forests</li> <li>- Maintaining and developing the works on forest management</li> <li>- Combating illegal logging and poaching, but also the forest fire prevention through daily patrols by forest personnel along with police and gendarmerie agents</li> <li>- Fire fighting by informing and warning the owners and the general public about the risk of the outbreak and the manner of intervention, restoring the insulating lines, placement of warning signs, strengthening the cooperation with volunteer</li> </ul>

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	<p>services, purchase of pumps etc.</p> <ul style="list-style-type: none"> <li>- Monitoring of bark and insect pest</li> <li>- Establishment of protective forest areas, including green rings</li> <li>- Introduction of treatment of gardened or quasi gardened woods conservation or conservation logging in Nature 2000 sites</li> </ul>
<b>Water resources</b>	<ul style="list-style-type: none"> <li>- Conducting studies to evaluate the danger of floods, droughts and water scarcity on watersheds and water needs assessment for the main categories of consumption (drinking, industrial, domestic)</li> <li>- Rehabilitating and improving the safety of flood defense infrastructure</li> <li>- Adapting to flood risk through measures regarding urban planning, afforestation works, water engineering works</li> <li>- Desynchronizing the rains and the melting snow from the mountains to reduce the incidence of spring floods</li> <li>- Creating new wetlands controlled by capitalizing the river bends</li> <li>- Extending, rehabilitating and modernizing the water and sewerage (including the dividing systems) and improving the treatment of waste and industrial water</li> <li>- Rationalizing water consumption in hot periods</li> <li>- Building storm water catch basins to irrigate green spaces and increasing water recycling for industrial needs</li> </ul>
<b>Biodiversity</b>	<ul style="list-style-type: none"> <li>- Recovery of forests, including the protected area status, to promote the outdoor activities, especially in warm weather (in strict compliance with industry regulations)</li> <li>- Expansion of protected natural areas</li> <li>- Develop and implement management plans for protected natural areas</li> <li>- Developing appropriate meadows watercourses, for leisure activities and for their ecological reconstruction</li> </ul>
<b>Energy</b>	<ul style="list-style-type: none"> <li>- Re-establishing, rehabilitating and modernizing the thermal energy centralized production and distribution system</li> <li>- Using renewable energy resources by setting up solar parks and wind farms</li> <li>- Improving the energy efficiency and reducing the supply costs to power homes, public buildings, industrial facilities, public lighting, public transport</li> <li>- Rehabilitation and modernization of natural gas distribution systems</li> <li>- Upgrading of the electricity distribution system</li> <li>- Establishment of hydroelectric power plants</li> <li>- Extension of grounding works of overhead power distribution and communication cables into the sewer system, etc.</li> </ul>
<b>Industry</b>	<ul style="list-style-type: none"> <li>- Increasing the share of services in the local economy, with lower power consumption and less vulnerable to climate change</li> <li>- Increasing the energy efficiency of different manufacturing</li> </ul>

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	<p>activities (eg. construction industry machinery and equipment, chemical industry, wood processing and furniture, etc.)</p> <ul style="list-style-type: none"> <li>- Development of industries favored by climate change (eg. food, pharmaceuticals etc.)</li> </ul>
<b>Transport</b>	<ul style="list-style-type: none"> <li>- The transition to environmentally friendly transportation alternatives and public transport, to relieve the traffic</li> <li>- Adapting the transport infrastructure to the new conditions and weather conditions</li> <li>- Developing the research-development-innovation in the transport sector for its adaptation to climate change</li> <li>- Extension, rehabilitation and upgrading the transport infrastructure and the development of intermodal transport systems</li> </ul>
<b>Tourism and leisure</b>	<ul style="list-style-type: none"> <li>- Development and diversification of recreational infrastructure</li> <li>- Effective use of existing recreational infrastructure, especially during high temperatures</li> <li>- Effective use of the potential of forests for recreational purposes</li> <li>- Development of exclusively pedestrian areas, integrated in ecological corridors for pedestrians and cyclists</li> <li>- Provision of snow cannons for ski slopes areas, allowing the expansion of the ski season</li> </ul>
<b>Public health</b>	<ul style="list-style-type: none"> <li>- Developing appropriate microclimate spaces located in busy areas, to assist the citizens during heat periods</li> <li>- Arrangement of street fountains for hydration in hot periods</li> <li>- Providing public transport vehicles with air conditioning</li> <li>- Providing public transport stations with shelters for passenger protection during periods of extreme weather</li> <li>- Raising awareness and educating the population on adaptation to climate change and response in emergency cases</li> <li>- Identify the groups that are vulnerable to cases caused by the climate change</li> <li>- Creating night shelters for homeless people during the cold season</li> <li>- Population health surveillance by monitoring the health indicators influenced by climate change</li> <li>- The effective use of the professional system for surveillance, prevention and reporting of public health events</li> <li>- Developing the private medical sector to provide emergency treatment in cases of extreme weather</li> <li>- Supply the emergency situations departments with modern and rapid intervention means</li> </ul>
<b>Infrastructure and town planning</b>	<ul style="list-style-type: none"> <li>- The use of studies / urban planning and strategic documents relevant to adaptation to climate change (PUG, PAED, SIDU, PMUD etc.)</li> <li>- Encouraging the people to spend longer periods of time outdoors (eg. setting up of recreational areas)</li> <li>- Expansion and modernization of public warning and intervention systems in cases of emergency</li> </ul>

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	<ul style="list-style-type: none"> <li>- Strengthen collaboration between the municipality and homeowners associations in the thermal rehabilitation to support the intervention in emergency situations, strengthening and rehabilitation of buildings, maintenance of green areas, etc.</li> </ul>
<b>Insurance</b>	<ul style="list-style-type: none"> <li>- Development of new insurance products by the insurance companies, designed to reduce the risks and vulnerability to climate change</li> <li>- More active involvement of local authorities in increasing the coverage of housing insurance against disasters</li> </ul>
<b>Education, Information and Awareness</b>	<ul style="list-style-type: none"> <li>- Development of new educational products in areas relevant to climate change adaptation, in partnerships including various relevant stakeholders at local level</li> <li>- Supporting local partnerships and volunteering in the field of climate change adaptation</li> <li>- Training of local government staff, teachers, medical, representatives of owners associations, and citizens in the field of climate change adaptation, energy efficiency, green procurement, management of emergency situations</li> <li>- Development of research, development and innovation in areas relevant to climate change adaptation</li> <li>- Promoting climate change adaptation measures in the strategic documents that are prepared at local level</li> </ul>

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The project develops between January 2015 and April 2017. The overall objective of this project is to reduce the vulnerability of humans and of the ecosystem to the climate change and envisages to create a best practices set on the adaptation to climate change.

“The contents of this material does not necessarily represent the official stand of the Financial Mechanism of the European Economic Area (EEA) grants 2009 – 2014”

For official information regarding the EEA Grants, access [www.eeagrants.org](http://www.eeagrants.org),  
[www.eeagrants.ro](http://www.eeagrants.ro)

The EEA Grants and Norway Grants represent the contribution of Iceland, Liechtenstein and Norway to reducing economic and social disparities and to strengthening bilateral relations with the beneficiary European countries. The three countries have a close cooperation with the EU by the European Economic Area (EEA) Agreement.

For the period 2009-2014, €1.79 billion has been set aside under the Grants. Norway contribution is approximately 97% of the total funds. The grants are available for NGOs, research and academic institutions and the public and private sector from 16 EU Member States, from Central and South Europe. There is a deep cooperation with the donor states entities and the activities can be implemented before 2016.

The key support fields are the environmental protection and climate change, research grants and scholarships, civil society, healthcare and children, gender equality, justice and cultural heritage.

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