




Best practice

# MUNICIPALITY OF CARTAGENA RISK ASSESSMENT

/ LIFE ADAPTATE project /

Prepared by:  
Primorje Gorski Kotar County – PP6

<b>Title of the Case study</b>	<b>Risks and Vulnerabilities assessment in the Municipality of Cartagena</b>
<b>General data</b>	
Promoter	<p><i>Please insert the name of the organization that promoted the case study (i.e. for a project, the Lead partner/main beneficiary):</i></p> <ul style="list-style-type: none"> <li><b>LIFE ADAPTATE project Lead Partner:</b> Instituto de Fomento de la Región de Murcia (INFO)</li> <li><b>Type of organization:</b> Development agency</li> <li><b>Description:</b> Instituto de Fomento de la Región de Murcia (INFO) is the development agency for the region of Murcia, an autonomous community of south-eastern Spain. The institute's main role is to boost the development of small and medium-sized enterprises in Murcia by promotion of the economy, investment-raising, elimination of obstacles and encouragement of competitiveness.</li> <li><b>Website:</b> <a href="http://www.institutofomentomurcia.es/web/portal/en">http://www.institutofomentomurcia.es/web/portal/en</a></li> </ul>
Timeframe	<p><i>Please insert the year(s) of reference (i.e. for a project, the years of implementation):</i></p> <ul style="list-style-type: none"> <li><b>LIFE ADAPTATE project implementation period:</b> 01 September 2017 to 30 September 2021</li> </ul>
Target area and scale	<p><i>Please indicate the area covered by the case study, specifying if it is a municipal, regional, or national-level initiative:</i></p> <p>It is a municipal initiative. The case study covers the area of Cartagena Municipality. Cartagena is a Spanish city located in the southeast of the Region of Murcia, in the Mediterranean Coast. There are 214,759 people living in the municipality, being the second largest municipality in the Region of Murcia. The metropolitan area of Cartagena, known as Campo de Cartagena, has a population of 409,586 inhabitants.</p> <p><b>Country</b>  Spain</p> 

	<p><b>Autonomous community</b>  Murcia</p> <p><b>Province</b> Province of Murcia</p>
Brief description	<p><i>Please describe briefly the Case study, explaining its context, main objectives, climate-related actions, outputs and results, as well as the key actors involved:</i></p> <ul style="list-style-type: none"> <li>• <b>Context:</b></li> </ul> <p>LIFE ADAPTATE project aims to increase the commitment of European municipalities with the Covenant of Mayors for Climate and Energy by the development of local adaptation plans which will be integrated in the previous mitigation objectives of several municipalities, giving a comprehensive approach to the fight against climate change.</p> <p>One of the specific objectives of LIFE ADAPTATE is to develop Sustainable Energy and Climate Action Plans (SECAP) in 6 municipalities in 3 different countries (Latvia, Portugal and Spain).</p> <p>One of the target areas in Spain is the Municipality of Cartagena. Its SECAP and its pilot action will encourage the adoption of measures to adapt the municipality to climate change, including green areas as an adaptation measure against heat waves.</p> <p>According to the Covenant of Mayors methodology, each SECAP is based on a Baseline Emission Inventory (BEI) and a Climate Risk &amp; Vulnerability Assessment(s) (RVAs) which provide an analysis of the current situation. These elements serve as a basis for defining a comprehensive set of actions that local authorities plan to undertake in order to reach their climate mitigation and adaptation goals.</p> <p>Thus, the Case study “Risks and vulnerabilities assessment in the Municipality of Cartagena” serves as a baseline document in the creation Cartagena’s SECAP.</p> <ul style="list-style-type: none"> <li>• <b>Main objectives</b></li> </ul> <p>Whereas SEAPs were not required to address climate change adaptation at all, SECAPs must do so. Unlike mitigation, adaptation has neither a unified ambition nor a quantitative threshold target, since appropriate actions will depend highly on local conditions. Similar to mitigation, however, an essential precursor to action is to establish a baseline, specifically through a Risk and Vulnerability Assessment (RVA).</p> <p>As part of an RVA, Municipality of Cartagena was supposed to identify relevant climate hazards, along with the level of risk and expected changes in intensity and frequency.</p>

- **Climate-related actions**

In order to analyse the historical events that the municipality has suffered and its resilience to climate change and natural hazards, available information on these topics have been compiled in The State Meteorological Agency and Statistical Portal of the Region of Murcia – CREM.

The first step in the analysis was is to select the key climate variables for the municipality. The following indicators were assessed:

- Rainfall (mm/day)
- Number of rainy days (days)
- Duration of dry periods (days)
- Percentile 95 of daily rainfall (mm)
- Maximum temperature (°C)
- Percentile 95 Max. temperature (°C)
- Minimum temperature (°C)
- Percentile 5 Min. temperature (°C)
- Number of warm days (days)
- Number of warm nights (days)
- Number of freezing days (days)
- Change in duration of heat waves (days)
- Heating degree days (°C day)
- Cooling degree days (°C day)
- Forest fires (ha affected per year)

- **Outputs and results**

Based on the above climate assessment, the climate hazards with greater consequences on the municipality were identifies as follows:

- High hazard risk level:  
Extreme heat  
Droughts
- Moderate hazard risk level:  
Floods  
Sea level rise  
Storms
- Low hazard risk level:  
Extreme cold

	<p>Extreme precipitation Forest fires</p> <p>Furthermore, socio-economic, physical and environmental vulnerabilities were described, as well as the factors that tend to increase them. Detected vulnerabilities have are evaluated to have the following adaptive capacity:</p> <ul style="list-style-type: none"> <li>• <u>Very low</u> Population density Population growth</li> <li>• <u>Low</u> Urban heat islands % old buildings Economic activity sensitive to climate change % of areas not accessible for services</li> <li>• <u>Medium</u> Presence of forest Buildings in risky areas Presence of affected coastal areas % population living in risky areas % sensitive population (elderly and similar)</li> <li>• <u>High</u> Difficulty to assess risky areas</li> <li>• <u>Very high</u> Soil pollution Water pollution % population with low cultural level</li> </ul> <p>Finally, The municipality of Cartagena has identified the sectors that will be affected (positively or negatively) by climate change. Those sectors are: Buildings, transport, energy, water, waste, land use planning, agriculture &amp; forestry, environment &amp; biodiversity, health, civil protection and emergency and tourism. For each sector, negative impacts were further assessed according to their expected effect on the municipality.</p> <ul style="list-style-type: none"> <li>• <b>Key actors involved</b></li> </ul> <p>Different types of stakeholders must be involved in the Climate Adaptation Plan development. The following groups of stakeholders were identified as important for the Municipality of Cartagena: municipal departments, municipal agencies and</p>
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	companies, regional government, civil organizations and similar, active in the fields of environment, infrastructure and services, transport, tourism, education, emergency services, urban and land planning, entrepreneurship, utility services, telecommunications, etc.
<b>Contribution of the Case study to the Joint_SECAP guidelines for Vulnerability and Risk assessment</b>	
Modules of the guidelines relevant to the case study	<p><i>Please select one or more Modules that you think the Case study gives a significant contribution to (i.e. through methodologies, methods, tools...). Refer to the Joint_SECAP Guidelines for further information on Modules:</i></p> <p><input checked="" type="checkbox"/> M1 PREPARING THE RISK ASSESSMENT (describes the context of the assessment - processes, knowledge, institutions, resources and external factors –, identifies its objectives, expected outcomes and scope, and defines tasks, responsibilities and time planning)</p> <p><input checked="" type="checkbox"/> M2 DEVELOPING IMPACT CHAINS (identifies and clusters impacts and risks, identifies hazard and intermediate impacts, vulnerability and exposure of the system)</p> <p><input checked="" type="checkbox"/> M3 IDENTIFYING AND SELECTING INDICATORS (identifies and select indicators for hazards, vulnerability and exposure)</p> <p>M4 DATA ACQUISITION AND MANAGEMENT (regards the collection, quality check, storage and management of data)</p> <p>M5 NORMALIZATION OF INDICATOR DATA (provides normalized data for each indicator in a standardized value)</p> <p>M6 WEIGHTING AND AGGREGATING OF INDICATORS (evaluates the influence of the indicators on the respective risk component, assigns different weights, aggregates individual indicators into composite indicators of the risk components hazard, vulnerability and exposure)</p> <p>M7 AGGREGATING RISK COMPONENTS TO RISK (aggregates the risk components into a composite risk indicator)</p> <p>M8 PRESENTING THE OUTCOMES OF YOUR RISK ASSESSMENT (describes how to elaborate the risk assessment report, taking into account both the objective and the target audience of the assessment)</p>
Descripti	<i>Please provide a detailed description of how the Case study contributes to the</i>

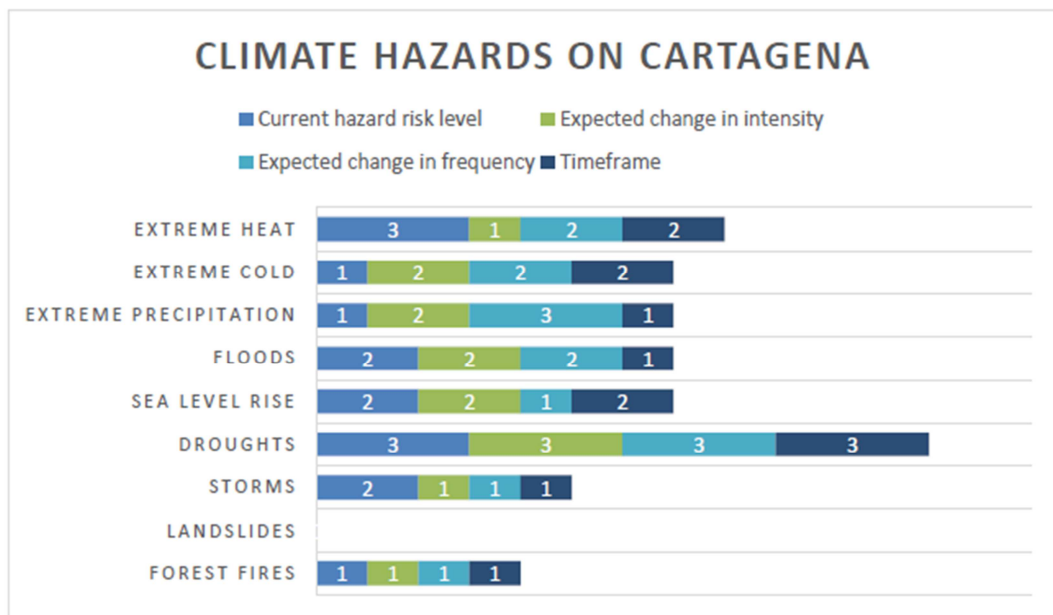
<p>on of the contribut ion of the Case study to the Joint_SE CAP guideline s</p>	<p><i>modules selected above, i.e. by explaining the methodological approach adopted, the methods and tools used, etc. The lines corresponding to the modules that are NOT been selected above shall be left blank:</i></p> <p>M1: Cartagena case study describes well how the working group was structured, who were the persons in charge, their names and positions. Furthermore, a rather long stakeholder list is included with details of every stakeholder's type of organization, sector and relevant competences. It also gives an extensive description of the geographical, historical, cultural and urban context.</p> <p>M2: A number of hazards were identified and scored on the basis of a current hazard risk level, expected change in intensity, expected change in frequency and timeframe of occurrence.</p> <p>M3: A number of relevant indicators were identified, described one by one, and summed up in a clear table-form preview. Baseline data were presented as well as projections for the year 2100. Vulnerabilities were also described and assessed based on their adaptive capacity and the degree to which a system is affected by or responsive to a hazard.</p> <p>M4:</p> <p>M5:</p> <p>M6:</p> <p>M7:</p> <p>M8:</p>
<b>References</b>	
<p>Website(s)</p>	<p>LIFE ADAPTATE project website: <a href="http://lifeadaptate.eu/en/project/">http://lifeadaptate.eu/en/project/</a></p>
<p>Bibliography</p>	<p><i>Please include references to books, papers or articles providing relevant information on the Case study:</i></p> <ul style="list-style-type: none"> <li>• Life ADAPTATE – Municipality of Cartagena, Spain (2019), URL: <a href="http://lifeadaptate.eu/wp-content/uploads/Deliverable-D.10.-Risks-and-Vulnerabilities-Assessment.pdf">http://lifeadaptate.eu/wp-content/uploads/Deliverable-D.10.-Risks-and-Vulnerabilities-Assessment.pdf</a></li> <li>• Compete4SECAP D5.4: UPGRADING FROM SEAP TO SECAP FOR INTEGRATED CLIMATE ACTION -A Quick Access Guide (2019), URL: <a href="https://compete4secap.eu/fileadmin/user_upload/EnMS/D5_4_SECAP_upgrade_guide_190916.pdf">https://compete4secap.eu/fileadmin/user_upload/EnMS/D5_4_SECAP_upgrade_guide_190916.pdf</a></li> <li>• Municipality of Cartagena official website, URL: <a href="https://www.cartagena.es/">https://www.cartagena.es/</a></li> </ul>



- European Commission's project database:  
[http://ec.europa.eu/environment/life/project/Projects/index.cfm?fuseaction=search.hdspPage&n\\_proj\\_id=6361](http://ec.europa.eu/environment/life/project/Projects/index.cfm?fuseaction=search.hdspPage&n_proj_id=6361)

Images

Please include pictures or graphs you deem relevant to illustrate the Case study:

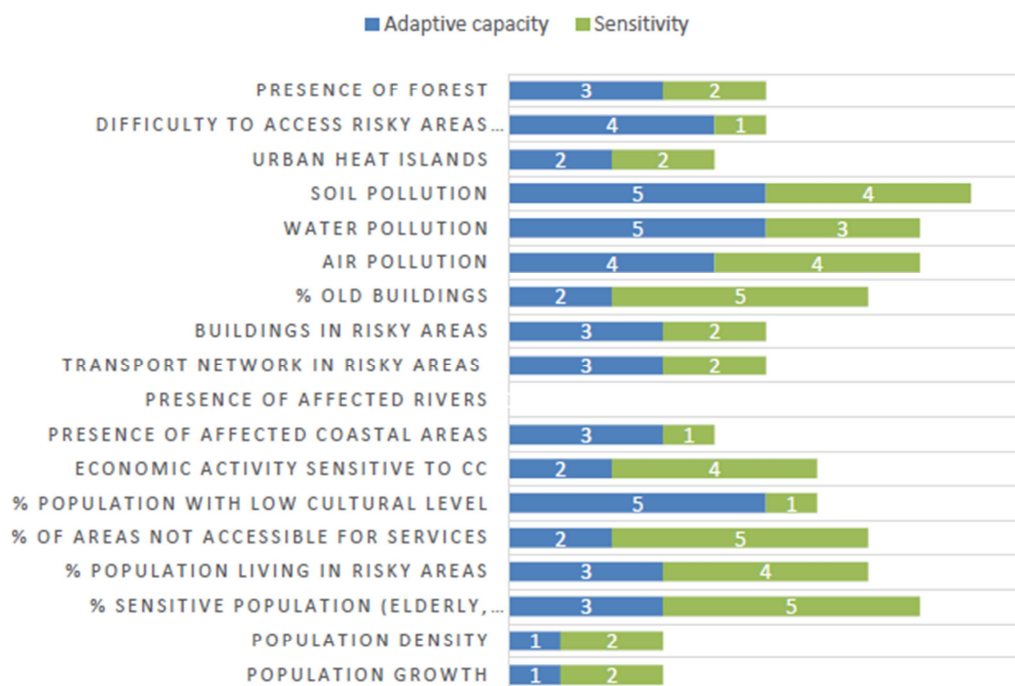


LEGEND:

Current hazard risk level (HRL)	Expected change in intensity (CI)	Expected change in frequency (CF)	Timeframe (T)
1- Low	1- Decrease	1- Decrease	1- Long term
2- Moderate	2- No change	2- No change	2- Medium term
3- High	3- Increase	3- Increase	3- Short term
			4- Current



## VULNERABILITIES IN CARTAGENA



Legend:

1 – Very low, 2 – Low, 3 – Medium, 4 – High, 5 – Very high