



Subgroup: Cities and Infrastructures

Case-study: Cascais Municipality

(FFCUL, Portugal)

**Case study developed by:**

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Fundação da Faculdade de Ciência da Universidade de Lisboa

**Project:**

FP7/ Project BASE [2012-2016]

**Date of release:**

**Purpose of this document:**

"The Case Studies Living Document (CSLD) will be the document that each case study leader will use to share the information that (i) characterize and give context to its case study, (ii) the goals within BASE, (iii) the methods used and mainly (iv) a synthesis of the results that that case study is providing to BASE project. This will allow the CS leader to understand how its own case is going (having a good overview), but also (v) will allow the sub-group to which the case study belong to know what is happening and what can be done (mainly on synergies and so on) as well as to (vi) WP4 & 5 coordinators to use that information to report (including each WP task leaders). These living document will also (vii) allow WP6 & 7 partner to know the information."

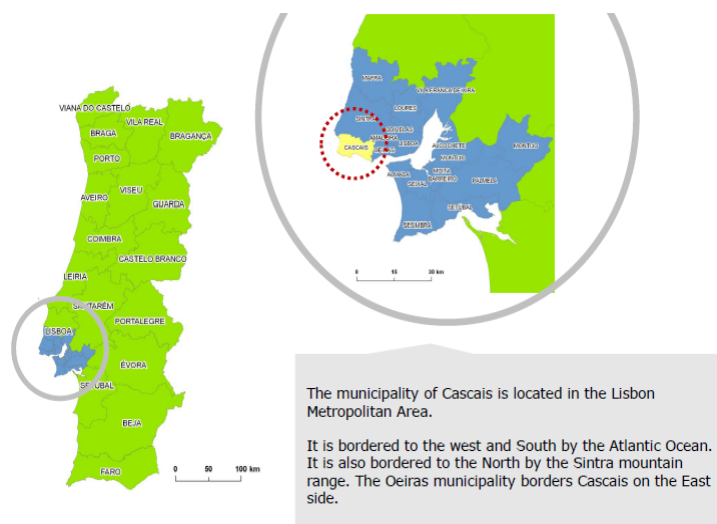
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# 1. General Case Study Description

## A. Location



The Municipality of Cascais is located in Europe's West coast, Portugal, 25 km West from Lisboa and facing the Atlantic Ocean having in its territory the famous Cabo da Roca, which is the european's continent western point. The Municipality has an approximated area of 30 sq Km and its bounded by two natural wonders: The Atlantic Ocean and Sintra-Cascais Natural Park.

GPS: N\_38.7 / W\_9.3\_  
Area: 30 km<sup>2</sup>



## B. Case Study Summary

Cascais is fundamentally a tourism-oriented municipality in Europe's West Coast, with a fast growing population – currently at aprox. 210.000 - as well as economic activity and urban area, although 33% of its area is within the Sintra-Cascais Natural Park, a UNESCO Reserve.

Cascais is well-known internationally for hosting big events such as MOTO GP and America's Cup and more recently for organizing important conferences such as GLOCAL and GREENFEST. For many, Cascais is a reference and a benchmark in Portugal for Sustainability and Participatory approaches making it an appealing as well as challenging case-study for BASE.

Important Milestones regarding Climate Change (and related issues) to be considered in the recent history of CASCAIS:

- 1996: Cascais signed the **Aalborg Commitments**
- 1997: **Agenda 21** Cascais was created
- 2008: Cascais signed the **Covenant of Mayors**
- 2010: Cascais elaborated a **Sustainability Strategy**
- 2010: **Strategic Plan for Climate Change in Cascais** was elaborated
- 2010: Congress Center of Estoril is awarded "**Green Venue**" - the only in Portugal
- 2011: First year of the Participatory Municipality Budget
- 2012: Cascais wins Quality Coast Gold Medal

## C. Context

The history of Cascais is deeply connected with its geographic context, namely the Ocean exposure, which made it a rich harbor for many fisherman and sailors since the Roman Ages and mainly during the period of the Discoveries, serving as the entry point to Lisboa and the Tagus River of any sailing boat coming from the Atlantic. From 1870 on, Cascais took another important historical turning point as it was chosen to be the Royal beach resort for the summer season for the King and all the Court. This transformed what was a fisherman's and sailor's village into a meeting place for Royalty and nobleman from all over Europe, setting up Palaces and rich houses which are still an important architectonic feature of Cascais and giving opportunity for Cascais to have the one of the first railway connection in Portugal, with Lisbon, in 1889. Since the 19<sup>th</sup> Century, the economy of Cascais has been growing exponentially, not due to industry or agriculture but mainly to the Tourism sector, namely an elite tourism for the Royal families of Europe. Today, Tourism is still the dominating sector, although it diversified in its nature and spectrum in order to accommodate a growing number of international events – for example Sea-related events such as Sailing, Surfing, Kitesurfing events – and Business Tourism which accounts for almost 1/3 of all revenues.

Not only the Ocean influenced the history of Cascais, also its Northern borders of the Sintra Mountains – peak at 529 meters – also known as Moon Mountain and part of the Serra da Estrela ridge which extends for more than 400 km, had their importance and still have in the balance between ocean and land, wind dynamics, vegetation and fauna. There are around 900 autochthonous species within the Natural Park, which nowadays represent 1/3 of the surface area of the Municipality of Cascais.

Being a very touristic place, Cascais is highly dependent on its overall Climatic conditions – namely for the practice of Golf and Beach, two key services for the region – and highly vulnerable to Climate Change impacts, namely on its natural capital. In the history of the Municipality, two types of Climatic Events stand-out, due to their regularity, impact and importance for the region: floods and fires. In more recent years, heat waves are also a growing concern for public authorities and several awareness raising campaigns have been targeting such issues.

## D. Brief General Information on Climate CHANGE and related issues

As we can read in the latest EEA Report – 03/2013, Cascais as well as the rest of the Mediterranean Region in Europe will witness, in the upcoming decades, the following impacts:

|   |                                     |
|---|-------------------------------------|
| Temperature increase;   | Decrease in Annual Precipitation;   |
| Increasing risk of biodiversity loss;                               | Increasing risk of desertification; |
| Decrease in crop yields;  | Decrease in annual river flow;      |
| Increase in mortality from heat waves;                              | Decrease in hydropower potential;   |
| Decrease in summer tourism and potential increase in other seasons; |                                     |

The more location-specific scenarios, are from the Strategic Plan for Climate Change (PECAC), which was elaborated using the IPCC 2007 Scenarios, and concluded for Cascais that:

- ✓ Cascais is going to warm up. It is estimated for Cascais that till mid-century the average annual temperatures will rise 1,7 °- 3,2 °C, with a stronger emphasis during the summer period (2,8 - 5,0 °C) than winter time (0,9 - 1,8 °C).
- ✓ Less rain...As for Precipitation, the scenarios point towards a decrease in the accumulated annual value from the current 630 mm for 530 – 600 mm till mid-century, and 420 - 580 mm Till the end of the century. These are significative decreases.
- ✓ Softer Winters...the monthly minimum temperatures in the winter will rise around 1 - 2°C till mid-century, 1 - 3°C end of the century.
- ✓ Be careful with tropical summers...Heat waves, still rare these days due to the presence of the Atlantic Ocean, will become more frequent and long lasting, occurring even during Spring and Autumn. This will translate into a more frequency of “tropical nights” with temperatures over. The period June-September will become drier and the number of dry summers will probably double or triple the current frequency.

As mentioned before, the Tourism sector is crucial for Cascais, while the Agriculture and Energy production play a minor role in the socio-economics of the Municipality.

During BASE, our focus will be in two key sectors: Tourism and Health.



## E. Existing Information on Case Study's adaptation history

The strategic Plan for Climate Change in Cascais was elaborated in 2009/2010. The report (in Portuguese) can be download here - <http://www.siam.fc.ul.pt/PECAC/index.php>. Cascais became one of the only 3 municipalities in Portugal to have a Strategic Plan for Climate Change. This work included a chapter on Adaptation, which was done by CCIAM/FCUL. In this work there were identified a key number of sectors and impacts to be addressed and 15 Adaptation Measures were proposed and prioritized against the vulnerability, risk assessment and potential costs & benefits. The project involved a Participatory Workshop with scientific experts which ranked the 15 Adaptation Measures according to their importance, urgency, no-regret, co-benefits and Mitigation.

| Rank | Medida (opção)   | Critério (Prioridade) |          |            |               |           | TOTAL |
|------|--|-----------------------|----------|------------|---------------|-----------|-------|
|      |  | Importância           | Urgência | No-regrets | Co-benefícios | Mitigação |       |
|      |  | 1 a 5                 | 1 a 5    | 1 a 5      | 1 a 5         | 1 a 5     | 1 a 5 |
| 1    | Operacionalização do Plano de combate a fogos  | 4,50                  | 4,75     | 4,75       | 4,25          | 4,25      | 4,50  |
| 2    | Reabilitação das Ribeiras e Galerias Rípcolas associadas   | 4,67                  | 4,58     | 4,25       | 4,00          | 2,67      | 4,03  |
| 3    | Melhorar o uso eficiente da água (tipo de rega e hora da rega) e reduzir desperdícios (manutenção) | 5,00                  | 4,58     | 4,33       | 3,92          | 2,25      | 4,02  |
| 4    | Assegurar a redução de descargas de poluentes pontuais sobre o meio hídrico                        | 4,75                  | 4,75     | 4,42       | 4,17          | 1,67      | 3,95  |
| 5    | Eliminar os focos de poluição dos corpos de água   | 4,83                  | 4,58     | 4,75       | 4,25          | 1,33      | 3,95  |
| 6    | Sensibilização dos vários agentes  | 4,58                  | 4,33     | 4,08       | 3,83          | 2,75      | 3,92  |
| 7    | Diminuição das perdas de água na distribuição  | 4,75                  | 4,83     | 4,75       | 3,17          | 2,00      | 3,90  |
| 8    | Desenho de programas de uso eficiente da água  | 4,75                  | 4,50     | 4,33       | 3,83          | 2,00      | 3,88  |
| 9    | Produção e promoção de produtos regionais  | 4,42                  | 4,00     | 4,42       | 3,83          | 2,42      | 3,82  |
| 10   | Impedir a realização de construções fixas na faixa de terreno adjacente à crista das arribas       | 4,83                  | 4,67     | 4,42       | 3,42          | 1,58      | 3,78  |
| 11   | Protecção contra a erosão  | 4,17                  | 4,08     | 4,42       | 3,58          | 2,50      | 3,75  |
| 12   | Criação de novos bosques   | 4,08                  | 3,67     | 4,00       | 3,50          | 3,33      | 3,72  |
| 13   | Criar alternativas de fornecimento de água (ex.: retenção de água pluvial)                         | 4,50                  | 4,00     | 4,00       | 3,75          | 2,25      | 3,70  |
| 14   | Reflorestação com espécies nativas   | 4,50                  | 3,92     | 3,75       | 3,33          | 2,92      | 3,68  |
| 15   | Assegurar a redução de descargas de poluentes difusos sobre o meio hídrico                         | 4,42                  | 4,42     | 4,17       | 3,75          | 1,67      | 3,68  |

Source: PECAC 2010

Our challenge will be to review all the work done according to the new IPCC Climate and Socio-Economic Scenarios as well as monitor and evaluate the implementation phase of the proposed (and also reviewed) adaptation measures. Our key addressed sectors of Research will be **Tourism and Health** and in terms of impacts will be focusing on **floods and Heat Waves**.



## F. Connection with other research projects:

Inexistent, so far. However, conversation have been going on with the Project “Value the Waves”.

## G. Case ID, Typologies and Dimensions

Having in mind the following BASE Objectives; Categories of Case Studies, please fill in the following table.

### BASE OBJECTIVES

1. Compile and analyze data and information on adaptation measures, their effectiveness. (...)
2. Improve current, develop new and integrate methods and tools to assess climate impacts, vulnerability, risks and adaptation policies (...).
3. Identify conflicts and synergies of adaptation policies at different levels of policy making with other policies (including climate mitigation) within and between sectors. (...)
4. Assess the effectiveness and full costs and benefits of adaptation strategies to be undertaken at local, regional, and national scales using innovative approaches (mainly by integrating bottom-up knowledge/assessment and top-down dynamics/processes) with particular attention on sectors of high social and economic importance.
5. Bridge the gap between specific assessments of adaptation measures and top-down implementation of comprehensive and integrated strategies.
6. Use and develop novel participatory and deliberative tools to enhance the effective use of local contextualized knowledge in adaptation strategies to assess perceptions of adaptation pathways and their co-design by citizens and stakeholders.
7. Disseminate findings by sharing the results of the project with policy-makers, practitioners and other stakeholders. (...)

### CASE STUDIES CATEGORIES

- A. Public administration (municipality, regional, national, european)
- B. Research and education Centres (universities, research centres, projects and groups, schools)
- C. Public companies
- D. Companies (farms, SMEs, big businesses)
- E. Social enterprises (cooperatives, non profit companies, woofing farms, etc)
- F. Consortiums (partnerships, campaigns),
- G. NGOs (environmental NGO, local development NGO, charities, etc)
- H. Transition Initiative
- I. Ecovillage
- J. Informal groups, Movements

| Case ID              |   |  | Typologies and characterization   |  |   |  |                        |
|----------------------|---|--|---|--|---|--|------------------------|
| Country & Name of CS | BASE Objectives to be answered by the CS        | Category of case study   | Territorial zones   | Scale  | Process Direction   | Temporal Definition  | Timescale <sup>1</sup> |
| PORTUGAL,            | <input checked="" type="checkbox"/> Objective 1 | <input type="checkbox"/> A, <input type="checkbox"/> E, <input type="checkbox"/> G | <input type="checkbox"/> Rural<br><input checked="" type="checkbox"/> Urban | <input checked="" type="checkbox"/> Local<br><input type="checkbox"/> Regional | <input checked="" type="checkbox"/> Bottom-Up<br><input checked="" type="checkbox"/> Top-Down | <input checked="" type="checkbox"/> Retrospective<br><input checked="" type="checkbox"/> Prospective | 2050                   |

<sup>1</sup> Please insert year of start and year of end of case study.

|         |   |  |   |   |  |  |  |
|---------|---|--|---|---|--|--|--|
| CASCAIS | <input checked="" type="checkbox"/> Objective 2 |  | <input checked="" type="checkbox"/> Coastal | <input type="checkbox"/> National         |  |  |  |
|         | <input type="checkbox"/> Objective 3            |  | <input type="checkbox"/> River Basin        | <input type="checkbox"/> Transnational    |  |  |  |
|         | <input checked="" type="checkbox"/> Objective 4 |  |   | <input type="checkbox"/> European /Global |  |  |  |
|         | <input type="checkbox"/> Objective 5            |  |   |   |  |  |  |
|         | <input checked="" type="checkbox"/> Objective 6 |  |   |   |  |  |  |
|         | <input checked="" type="checkbox"/> Objective 7 |  |   |   |  |  |  |
|         |   |  |   |   |  |  |  |

## H. Impacts, Sectors and Implementation

Please tick the relevant boxes for impacts and implementation and insert the number 1 for primary sector and the number 2 for secondary sector.

| Impacts   |  | Sectors  |   | Implementation   |  |
|---|--|--|---|--|--|
| Primary CC Impacts (Climate-Adapt)  | Primary CC Impacts (BASE)  | Primary and Secondary Sector (Climate Adapt)   | Primary and secondary Sector (BASE)   | Implemented <sup>2</sup>   | Phase of Implementation <sup>2</sup>   |
| <input checked="" type="checkbox"/> Extreme Temperatures<br><input checked="" type="checkbox"/> Water Scarcity<br><input type="checkbox"/> Flooding<br><input type="checkbox"/> Sea level Rise<br><input type="checkbox"/> Droughts<br><input type="checkbox"/> Storms<br><input type="checkbox"/> Ice and Snow | <input checked="" type="checkbox"/> Extreme temperatures<br><input checked="" type="checkbox"/> Water scarcity<br><input type="checkbox"/> Flooding<br><input checked="" type="checkbox"/> Coastal Erosion<br><input type="checkbox"/> Droughts<br><input type="checkbox"/> Soil Erosion<br><input type="checkbox"/> Vector Borne Diseases<br><input checked="" type="checkbox"/> Damages from extreme weather related events (storms, ice and snow) | <input type="checkbox"/> Agriculture and forest<br><input type="checkbox"/> Biodiversity<br><input type="checkbox"/> Coastal Areas<br><input type="checkbox"/> Disaster risk reduction<br><input type="checkbox"/> Financial<br><input checked="" type="checkbox"/> Health<br><input type="checkbox"/> Infrastructure<br><input type="checkbox"/> Marine and Fisheries<br><input type="checkbox"/> Water Management<br><input checked="" type="checkbox"/> Urban | <input type="checkbox"/> Agriculture<br><input type="checkbox"/> Biodiversity & Ecosystems<br><input type="checkbox"/> Coastal and Marine systems<br><input type="checkbox"/> Energy<br><input checked="" type="checkbox"/> Health and Social Policies<br><input type="checkbox"/> Transport<br><input type="checkbox"/> Production Systems and Physical Infrastructures<br><input type="checkbox"/> Water resources<br><input checked="" type="checkbox"/> Tourism | <input type="checkbox"/> Yes<br><input checked="" type="checkbox"/> Ongoing<br><input type="checkbox"/> No | <input checked="" type="checkbox"/> Assessment<br><input checked="" type="checkbox"/> Planning<br><input checked="" type="checkbox"/> Implementation<br><input checked="" type="checkbox"/> Monitoring<br><input checked="" type="checkbox"/> Evaluation |

## I. Importance and Relevance of Adaptation

Please tick the relevant box for the case study.

- ☒ Case developed and implemented as a climate change adaptation measure
- ☐ Case developed and implemented and partially funded as a climate change adaptation measure
- ☒ Case mainly developed and implemented because of other policy objectives, but with significant consideration on climate change adaptation aspects

<sup>2</sup> When the case study consists of a public administration with a top down approach, implementation can be an approved legislation or regulation. When the case study is about practical adaptation measures like a sand dune, for example, implementation should be considered finished when the dune is built in situ.

## 2. Case study research Methodology

### a) Research Goals

#### **General Goals for the case study:**

- Understand the state of the art regarding the Adaptation strategies in Cascais, namely a follow-up evaluation of the 2010 Strategic Plan for Climate Change Adaptation in Cascais
- Build and Adaptation Scorecard and an Adaptation Pathways Graph based on CBA and PCBA for a key number of prioritized Adaptation Measures
- Identify vulnerabilities and opportunities for Adaptation Action in Cascais connecting and mobilizing key actors at multilevel and with multidisciplinary approaches

#### **Specific contribution for BASE project:**

- Important city case study for Climate Adapt as we'll be working with two key sectors (Health and Tourism) and with Economic analysis
- Answering all BASE City questions and giving inputs for Models (Health mainly).
- Understanding the dynamics of decision-making and action making at all levels (micro, meso and macro)

### b) Stakeholders involved

Cascais Municipality: Cascais Municipality has 1717 employees and is divided into 11 specific departments (see attachment). Although our action-research will be transversal to many of them, our anchor and contact point will be within the Department of Strategic Development, namely the head of the Agenda XXI, João Dinis. João has already been involved in the Strategic Plan for Climate Change of Cascais as well as in the early stages of our research work and has been a key element not only in the coherent definition of the Research Methodology but mainly in its implementation, setting up, within the Municipality, a transversal work group for Climate Change Adaptation lobbying and implementation.

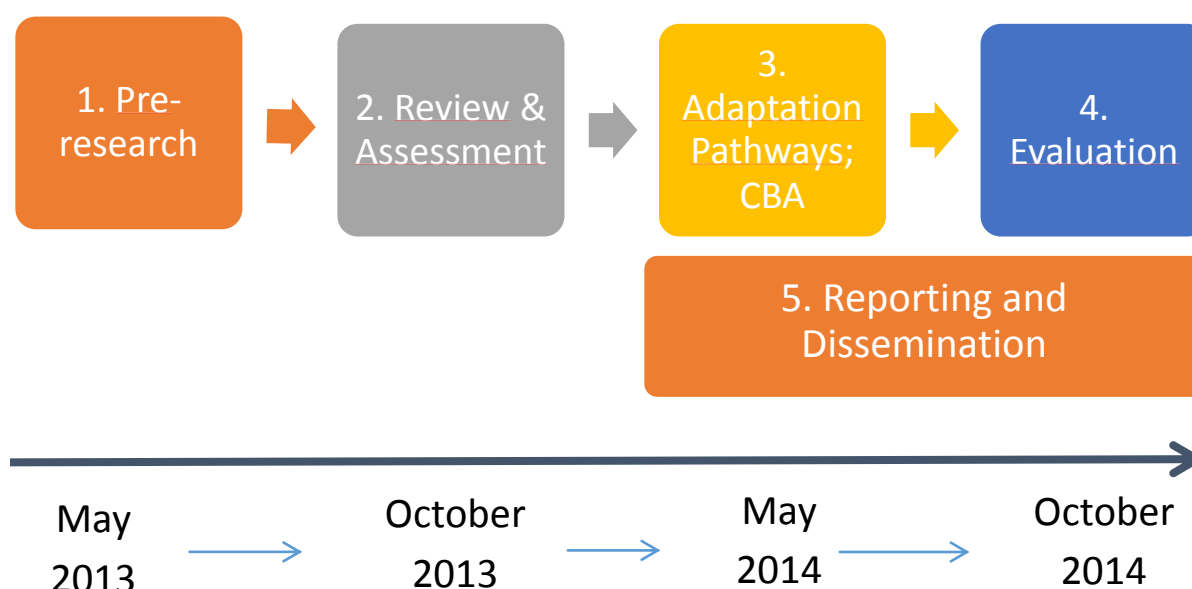
Local Municipality "Agencies": Cascais has many local "agencies" partly or totally owned by public money but run privately. These are responsible for many key services, such as Recycling; management of public green spaces; maintenance of key infra-structures; new business incubators, etc. They represent a key stakeholder for the implementation of the Adaptation Measures.

Civil Protection: Also part of the Municipality but with autonomy the Civil Protection Department is key in our process as they are responsible for the implementation of a number of important Adaptation Measures as all information and awareness raising campaigns and the Fire Protection and Prevention Plan (see attachment).

## c) Methodology

The case study methodology was co-created with the head of Agenda 21 of Cascais, following three preparatory meetings and officially accepted in the 28<sup>th</sup> of May of 2013.

### Research approach (process in time)



#### 1) Pre-research (Until the 30<sup>th</sup> of May 2013)

- Initial information about the Case-Study
- Start-up, exploratory meeting with the CS representatives
- Methodological Definition and Alignment
- Planning of the Research Project
- Preliminary Questionnaires (being sent to the CS, to be filled until the 15<sup>th</sup> of May)

#### 2) Review and Assessment (June/July/August)

- First shared Analysis of the Initial Data collected in Phase 1 (28<sup>th</sup> of May – Working Meeting with CS representatives)

- Co-definition of the research questions (28th of May – Working Meeting with CS representatives)
- Participatory Session with different stakeholders for reviewing PECAC 2010 - 26<sup>th</sup> July 2013

### 3) Adaptation Pathways & CBA (October'13 - October'14)

- Multiple Stakeholder meetings with simplified PCBA for Adaptation Measures Clusters
- CBA for key selected Adaptation Measures

### 4) Evaluation (May'14 – October'14)

### 5) Reporting and Dissemination (May'14 - October'15)

- Publication and Dissemination of Results
- Scientific papers
- Participatory sessions for decision-making processes with AP

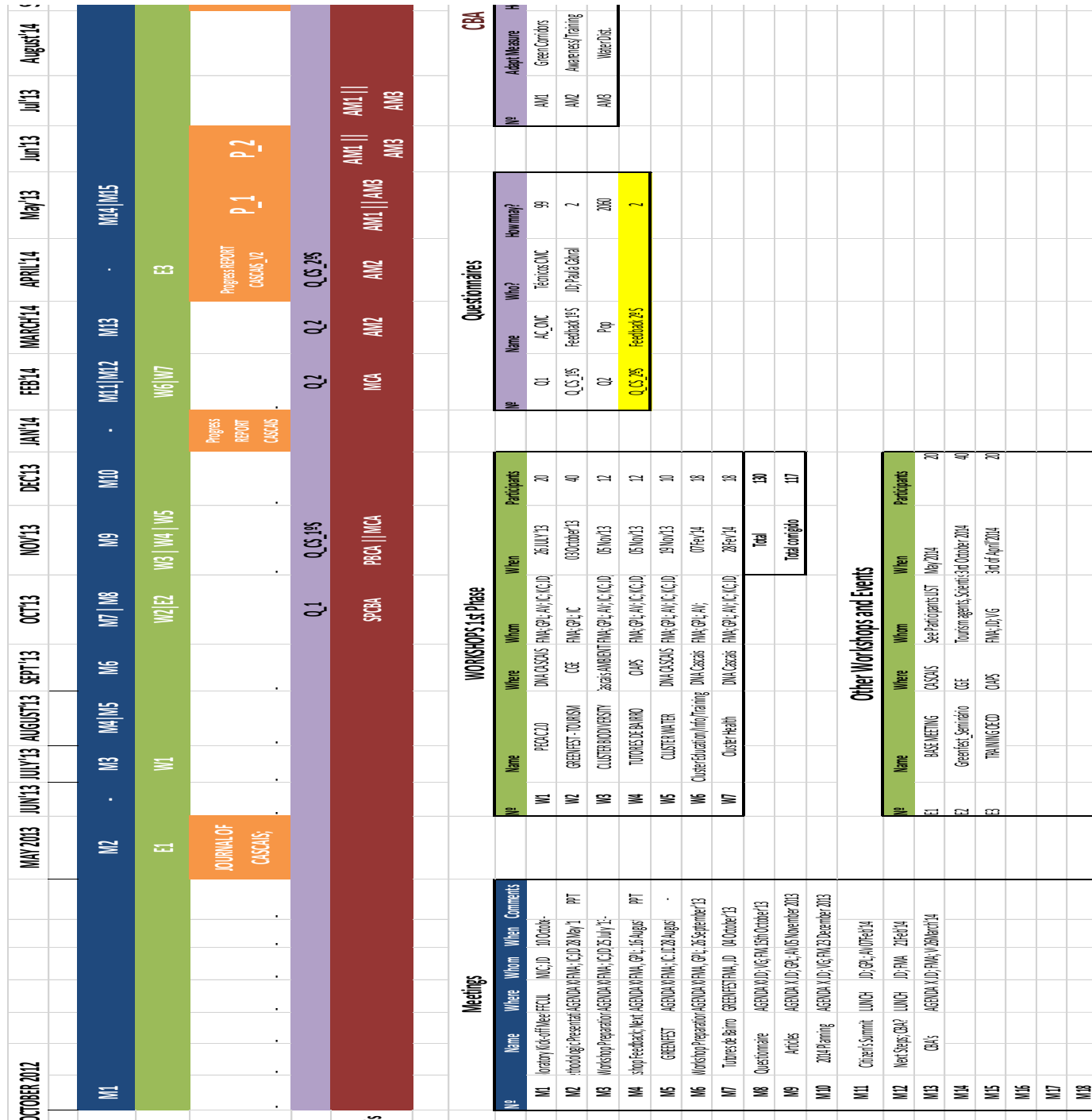
- Note: Partners/Case Studies using PRIMATE tool will be using CBA (to prioritize) and/or MCA (with stochastic PROMETHE II) and the Monte Carlo Uncertainty Analysis, so please check these boxes.

| METHODS to be used in Case Studies <sup>3</sup>  | YES // NO |
|--|-----------|
| <b>A) Methods for prioritizing adaptation options</b>                                      |           |
| Cost-Benefit Analysis (CBA)  | YES       |
| Cost-Effectiveness Analysis (CEA)  | NO        |
| Multi-criteria Analysis (MCA)  | YES       |
| Analytic Hierarchy Process (AHP)   | NO        |
| <b>B) Quantification of impacts and relationships between factors affecting adaptation</b> |           |
| Causal Diagrams  | NO        |
| Influence Diagrams   | NO        |
| Process-based Modelling  | NO        |
| Welfare variation analysis under restrictions  | NO        |
| <b>C) Uncertainty and sensitivity analysis</b>   |           |
| Probabilistic multi model Ensemble   | NO        |
| Monte Carlo simulations ( PRIMATE uses this method)  | YES       |
| Real option analysis   | NO        |
| Climate risk management process  | NO        |
| <b>D) Participatory Methods</b>  |           |
| Scenario Workshop  | NO        |
| Participatory Cost Benefit Analysis (PCBA)   | YES       |
| Participatory add-ons to CBA   | YES       |
| Participatory add-ons to Multi Criteria Decision Analysis                                  | YES       |
| Participatory add-ons to Adaptation Pathways   | NO        |
| Other (add extra lines if necessary):  |           |

(Máx 500 words) Please highlight if you have any special need or focus regarding any of these methods and their use on your case study.

<sup>3</sup> For descriptions and references of the Methods please refer to Milestone 8. For data requests from specific Work Packages please refer to Deliverable 4.1

## d) Case study Timeline



## e) Collaboration with other Partners and Case studies

**Collaboration with BASE case studies** (see list in EMDESK):

Case: COPENHAGEN ; Person: BJORN BJORNSTED



Case: JENA ; Person: OLIVER GERHART

Case: \_\_\_\_\_; Person: \_\_\_\_\_

### **Collaboration within BASE partners/researchers** (EX: for a specific competence):

Name: VOLKER MEYER; Partner: UFZ

Name: ALESSIO CAPRIOLO ; Partner: ISPRA

Name: ANDREAS HASLTRUP ; Partner: DBT

Name: \_SOREN; Partner: \_DBT

Name: BJRON BJORNSTED ; Partner: \_DBT

Name: ELISKA ; Partner: CZECH GLOBE

## **f) Research Outputs**

### **a. Scientific Publications**

- Interim reports + final case study report for D5.5 (Month 30)

- Scientific papers: # 3

Provisional Title: CLIMATE CHANGE ADAPTATION AT THE LOCAL LEVEL: BARRIERS AND OPORTUNITIES IN CASCAIS MUNICIPALITY ; Month/Year: 11/2014

Provisional Title: CLIMATE CHANGE ADAPTATION PERCEPTIONS AT THE LOCAL LEVEL: A POPULATION INQUIRY IN CASCAIS; Month/Year: 11/2014

Provisional Title: THE USE OF PARTICIPATORY METHODOLOGIES IN CLIMATE CHANGE ADAPTATION AT THE LOCAL LEVEL: THE CASE OF CASCAIS; Month/Year: 12/2014

### **b. Other Publications**

- Books/Books Chapters: # 1

Provisional Title: Inspiring Adaptation Strategies and Actions of Cascais; Month/Year: 05/2015

### c. Other

- Scientific conferences: # 1

Provisional Title: BASE FINAL CONFERENC Month/Year: 09\_/2016

GREENFEST 2013/2014/2015

GLOCAL 2014

### 3. Participation in Climate Change Adaptation

#### a) Process overview

Participatory Methodologies in Cascais have been extensively used as a mean as well as an end itself and are at the core essence of BASE work with the Cascais Municipality from day 0. Our research work with Cascais Agenda XXI started in October 2012 with preliminary/exploratory meetings with representatives from the Municipality in order to align ourselves with the municipality needs and expectations while at the same time set agendas and resources to meet the goals that together we've co-created. The road to the final definition of the research methodology was itself a participatory iterative process which allowed us to bring the Cascais Municipality fully aboard and expand, well over our initial ambition, our aspirations towards the case study. We've organized 7 participatory workshops with different stakeholders engaging more than 120 people, conducted 2 questionnaires – one for the municipality's technical body (99 valid answers), the other for the general population (2060 people) – and we're planning to host a Citizen's Summit no later than November 2014. All summed up this makes Cascais BASE's case study icon regarding the use of Participatory Methodologies.

#### The 7 Workshop Cycle

1. Workshop PECAC 2.0 – 26<sup>th</sup> of July; 20 Participants; DNA Cascais
2. Workshop GREENFEST (TOURISM) – 03<sup>rd</sup> of October; 30 Participants; Estoril Congress Center
3. Workshop PECAC 2.1 Biodiversity Cluster – 05<sup>th</sup> of November; 12 Participants; Cascais Ambiente
4. Workshop Neighborhood Tutors – 05<sup>th</sup> of November; 12 Participants; CIAPS
5. Workshop PECAC 2.1 Water Cluster – 19<sup>th</sup> of November; 10 Participants; DNA
6. Workshop PECAC 2.1 Education | | Training | | Raising Awareness – 7<sup>th</sup> of February 2014; 17 Participants; DNA
7. Workshop PECAC 2.1 Health – 21<sup>st</sup> of February'14; 18 Participants; DNA

The 7 Workshop Cycle had three key purposes: PAST - Analyze and evaluate PECAC 2010; PRESENT - Re-prioritize according to new knowledge and possibilities; FUTURE – PBCA, MCA and Road Maps on selected Adaptation measures. The first was the kick-off workshop bringing together representatives from the majority of the municipality departments, as well as from key stakeholders – Police, Fireman, Civil Protection, NGO's -, for a full day of work with the BASE Team. After that we had sector-specific workshops with sector-specific stakeholders and adaptation measures under analysis as well one workshop (4) with the Neighborhood Tutors of Cascais for a more in depth, non-technical, non-political perspective. These workshops took place between the 3<sup>rd</sup> of October 2013 and the 21<sup>st</sup> of February 2014, were made possible with the strong commitment of the Agenda CASCAIS XXI and enabled us to have a wide and clear picture of the considerations of different stakeholders regarding what had been done, what should be done and

what could be done, by whom, when. The workshops followed always the same structure and logic, with minor changes to accommodate different size groups or available time.

Along this period, since the beginning of WP5 - Month 6 -we've also conducted Evaluation Questionnaires on us, our work and methodologies, by the municipality, on a semester base.

## b) Participation in the Process Phases

(Please uncover the role of all participants in the process of implementing adaptation measures. The adaptation implementation has been divided into four phases for purposes of ease: 1) Initiative/decision to act, 2) Development of potential adaptation options, 3) Decision-making, and 4) Implementation. The process phases are to be filled out with information corresponding to each participant. I.e. if experts were not consulted in the 'decision-making' phase, then describe why they were not included. It is also important that a wide array of participants is described, including those that were excluded from parts of the process. )

Make a bullet point for each of the five participant categories below (and distinguish between for example different stakeholder or expert groups) and be as descriptive as possible how, why/why not were they involved.

### Process phases:

#### 1. Initiative/decision to act

Stakeholders: Municipality of Cascais || CCIAM/FFCUL

Citizens – Not involved at this stage. This was not a citizen-led initiative. Citizens were involved in a later stages of the process.

Experts – Involved, both from the Municipality – João Dinis – as well as from FFCUL – Gil Penha-Lopes, Filipe Moreira Alves

Politicians – Involved. Head of Division of Environment of the Municipality was fully behind the process and very supportive. However, this was also not a 'Politician-led initiative'

Officials/legislators – Not involved. This is was not a law-driven/regulation-driven process.

#### 2. Development of potential adaptation options

Stakeholders: Municipality of Cascais || CCIAM/FFCUL

Citizens: Partially involved in one of the workshops

Experts: Involved both directly and indirectly through literature review and expert-based suggestions for CC Adaptation Measures. Experts from the Municipality were also highly involved in the participatory workshops and in the debate of the adaptation measures

Politicians: Not involved. Invited for the workshops as well as for the meetings and the planning but rarely attended.

Officials/legislators: Low involvement. Only when strictly needed and in an expert-based engagement purely for advising.

#### 3. Decision-making

Stakeholders: Municipality of Cascais || CCIAM/FFCUL

Citizens: Will be involved in the Citizens Summit

Experts: involved in the Multi-criteria analysis regarding different adaptation measures

Politicians: involved, namely the Municipality Director for Environment.

Officials/legislators: Not involved.

#### 4. Implementation

Stakeholders: Municipality of Cascais || CCIAM/FFCUL || Águas de Cascais || QUERCUS || IES ||

Citizens: partially involved, namely in some adaptation measures which were conducted by NGO's and through voluntary efforts – example: reforestation.

Experts: Highly involved

Politicians: Not involved.

Officials/legislators: Not involved.

### c) Participation Experience

(Please report with regards to your case study and the implementation of Participatory Methodologies using a traditional SWOT analysis – Strengths; Weaknesses; Opportunities and Threats)

|   |   |
|---|---|
| <p><b>Strengths</b></p> <p>Engagement and alignment within the Municipality workforce</p> <p>Debate and communication between different stakeholders allowed for easier and more concrete implementation plans as well as to spot efficiencies in shared resources and shared responsibilities</p> <p>Innovative and transparent which brought curiosity and trust to all the process</p> | <p><b>Weaknesses</b></p> <p>Workshops were not righty timed as they happened too far from each other..some times months.</p> <p>Not always the experts engagement and participation was efficient and representative</p> <p>Reliance on just one contact point within the Municipality is not resilient</p> |
| <p><b>Opportunities</b></p> <p>Build a transversal working group on Climate Change from the critical mass engaged in the workshops</p> <p>Increased know-how from the Municipality workforce and their partners regarding CC</p> <p>Training and awareness raising..Participatory action-research seen as an adaptation measure</p>   | <p><b>Threats</b></p> <p>Becoming a participatory “circus” if there isn’t serious political power supporting the process as well as the decisions</p> <p>Too much participation without concrete action can lead to frustration and disengagement</p> <p>Timing is essencial</p>                            |

## d) Learning through Participation

In order to capture how participation could improve the climate change adaptation process, please report with regards to your case study:

a) Your view whether and how participation influenced the strategies and measures decided in your case?

The participatory process had a great influence in determining which concrete actions should be prioritized and implemented in Cascais as well as in the overall strategy regarding Climate Change adaptation in Cascais. The evidence supporting this statement is very clear as when we analyse all the data from the 7 participatory workshops we've come to realize that the scientific expert-based priorities ranked in a multicriteria exercise in 2010 and which feed directly into PECAC 2010, were unanimously disregarded and transformed by all stakeholders - experts and citizens – giving birth to the new, revised PECAC 2014, which not only has new adaptation measures considered but also as a new priority ranking list. Without the participatory process we've conducted it would never be possible to compare the visions from the scientific experts, with the vision from the municipality experts with the citizen's opinions and ideas and construct an overall strategy which builds from existing scientific knowledge, from expert-based field knowledge from many Municipality departments and is validated by the citizen's.

b) How you think the participatory process in your case could be/have been improved?

More political support and engagement within the Municipality;  
Bigger team from our side to quicker analyse results and put them efficiently to the use of the municipality;  
Better communication of results after each workshop

c) Any novel (use of) participatory methods observed in the case studies

Yes, we've tested the SPCBA as suggested by the Climate Resilient Network.

FINAL NOTE:

For more information and specific details on Stakeholders involved please read: Cascais Progress Report available on EMDESK.

## 4. Climate Change Adaptation Measures and Strategies

### a) Adaptation Measures under analysis in your case study

Adaptation Measure(s):

- 1) Green Corridors of Cascais
- 2) Water savings in distribution
- 3) Training and Raising Awareness Workshops and Events

Short description for each Adaptation Measure (Máx 50 words):

#### 1) Green Corridors of Cascais

The CC adaptation measures 'Green Corridors' aims to implement in the city of Cascais, through the re-ability of the existing riparian galleries and the unification of the parks gardens and florests, a connected and integrated green infrastructure which reduces the city vulnerability to floods as well as heat waves while at the same time contributes to a greater quality of living and increased Sustainability of the Municipality.



#### 2) Water savings in distribution

The CC adaptation measure 'Water savings in distribution' aims to implement in Cascais the WONE System – Water Optimization for Network Efficiency – in order to reduce the water waste in distribution from the current 17% to 6% and by doing so reduce Cascais vulnerability to Drought.



### 3) Training and Raising Awareness Workshops and Events

The CC adaptation measure 'Training and Raising Awareness' aims to Train and Raise awareness for climate change impacts, scenarios and adaptation possibilities for the Municipality workforce as well as specific target-groups such as the Neighborhood tutors through participatory workshops and the dissemination of knowledge and information through different channels.

### b) Adaptation Measures selection and data availability prior to BASE

(Please describe how and why where these specific measures selected for further research and analysis under BASE and what is the baseline data already available for each specific adaptation measure. Máx 500 words)

These were the three measures considered as Top Priorities for the PECAC 2014 by 150 different stakeholders after 7 participatory workshops. Prior to BASE the baseline information for these measures in Cascais is scarce and low. However, the municipality already had a Preliminary Study on the Green Infrastructure for Cascais, a project idea for the Training workshops and a Portuguese benchmark in Lisbon for the implementation of the WONE.

### c) Full description of Adaptation Measures

(Please provide a full description on each of the Adaptation Measures regarding this 21 leading questions under. If more than one Adaptation Measure please copy paste the structure provided.)

#### Process

- I. Would, or at which part would, institutions and private stakeholders implement the measure autonomously to adapt to climate change (Adaptive capacity)?

- 1) the measure would be adopted autonomously by the municipality, not as aa adaptation measure but as part of the municipality green infrastructure plan, although it wouldn't be integrated neither consider climate change scenarios and impacts
- 2) The measure is likely to the implemented in the near future, through the initiative of Águas de Cascais under their plan to increase efficiency in distribution
- 3) The measure is unlikely to be implement autonomously

- II. Does the measure initiate further activities for adaptation to climate change? (Y/N)

- 1) YES. It gives the possibility to explore Urban food gardens and water retention gardens
- 2) YES. The measure is likely to be complemented by a water saving campaign for households
- 3) YES. Internalization of the PECAC 2014 in all Municipality departments and strategic processes

- III. Does adaptation aim for flexibility and reflexivity (i.e. the ability to change as CC and other factors develop )?

- 1) YES

2) YES

3) YES

IV. Is the measure effective under different climate scenarios and different socio-economic scenarios?

1) YES

2) YES

3) YES

V. Is the adaptation measure iterative? (Y/N)

1) YES

2) YES

3) YES

4) Does the measure contribute to overall sustainable development, alleviate already existing problems and bring benefits for other social, environmental or economic objectives than adaptation (no regret measures)? YES TO ALL

a. Please describe briefly how

- 1) Increased well-being and life quality (better air quality, water quality, shade, meeting spaces, places for leisure activities); increased environmental resilience and biodiversity
- 2) Reduce water tariffs in the middle term
- 3) NO

5) Can adjustments be made later if conditions change again or if changes are different from those expected today? YES to all.

## Outcome

### **Relevance and effectiveness of adaptation measures**

6) How important is the climate change threat addressed by the measure? What economic values, ecosystem functions and socio-cultural values are at stake, and to what extent are they affected by climate change impacts? Is there an indication of overriding public interest, e.g. critical infrastructures, public health ?

- 1) Green corridors play a fundamental role addressing both heat waves and heat Island effects in cities as well as urban floods. In Cascais, these are, together with Sea Level Rise, the most important climate change impacts for the future. Please see Gil, S.E. et al (2006), Adapting cities for Climate Change: the role of green infrastructure, Built Environment, VOL 33. N1
- 2) Water efficiency both in distribution and consumption is critical for Mediterranean countries as water scarcity is and will be a major stress for our societies. The water distribution infrastructure plays a central role in this.

- 7) What portion of the targeted potential damages can be avoided by implementing the measure?  
(0-100%)

NO DATA FOR AN ACURATE AND SOLID ESTIMATE YET.

### **Efficiency**

- 8) How high are the benefits of the measure relative to the costs? Are the costs justified by the benefits (Please refer to results of economic evaluation in chapter 5)

(fill with your answer)

- 9) What are the costs of the administrative implementation of the measure? Are there potential funding under the umbrella of other European policies(eg. CAP/Cohesion policy ?

(fill with your answer)

- 10) Does the measure give an incentive for innovation to different actors (e.g. SMEs) / can it deliver a competitive advantage for the local economy?

- 1) YES but not significantly.
- 2) YES.
- 3) NOT DIRECTLY.

- 11) Does the measure have effects on employment?

- 1) YES but minor
- 2) YES
- 3) NO

12) How long is the time-lag between implementation of the adaptation measure and the effect of the measure?

- 1) 2/3 Years
- 2) 2 years or immediate after complete implementation
- 3) Not concrete

13) What is the timeframe during which the measure will have an effect?

- 1) If maintained, ad eternum
- 2) 10 years
- 3) Not concrete

14) Does the measure create synergies with mitigation (i.e. reduce GHG emissions or enhance GHG sequestration)?

- 1) YES, carbon storage in the Green infrastructure
- 2) NO
- 3) NO

15) Does the measure alleviate or exacerbate other environmental pressures? (Explain briefly)

- 1) YES, alleviates the urbanization pressure
- 2) YES, alleviates the need for water availability at the source
- 3) NO

### **Equity**

16) What are the impacts on different social or economic groups, are there expected impacts on

- 1) Positive impact for the overall society although it might have a great marginal impact on low-income groups living near to the green corridors due to open accessibility
- 2) YES, greater marginal impact for low-income people regarding reduction on water tariffs
- 3) NO

particularly vulnerable groups? (distributional impact)

17) Does the measure enhance well-being and quality of life (e.g. in the urban environment)? (Y/N)

- 1) YES, Green Infrastructure. Please see reference above.
- 2) NO
- 3) NO

## 5. Impacts, Costs and Benefits of Adaptation measures

(This section of the CSLD follows the Economic Assessment Steps put forward by UFZ and thoroughly described in D4.1, chapter 4. Please check D4.1 for any doubts or questions. In case of duplication of information with previous sections of the CSLD feel free to copy paste.) For more detailed guidance (incl. two examples) please see the above mentioned chapter 4 of D4.1. Please do not hesitate to contact [volker.meyer@ufz.de](mailto:volker.meyer@ufz.de), [oliver.gebhardt@ufz](mailto:oliver.gebhardt@ufz) or Filipe Alves if you have questions about how to fill out this section.

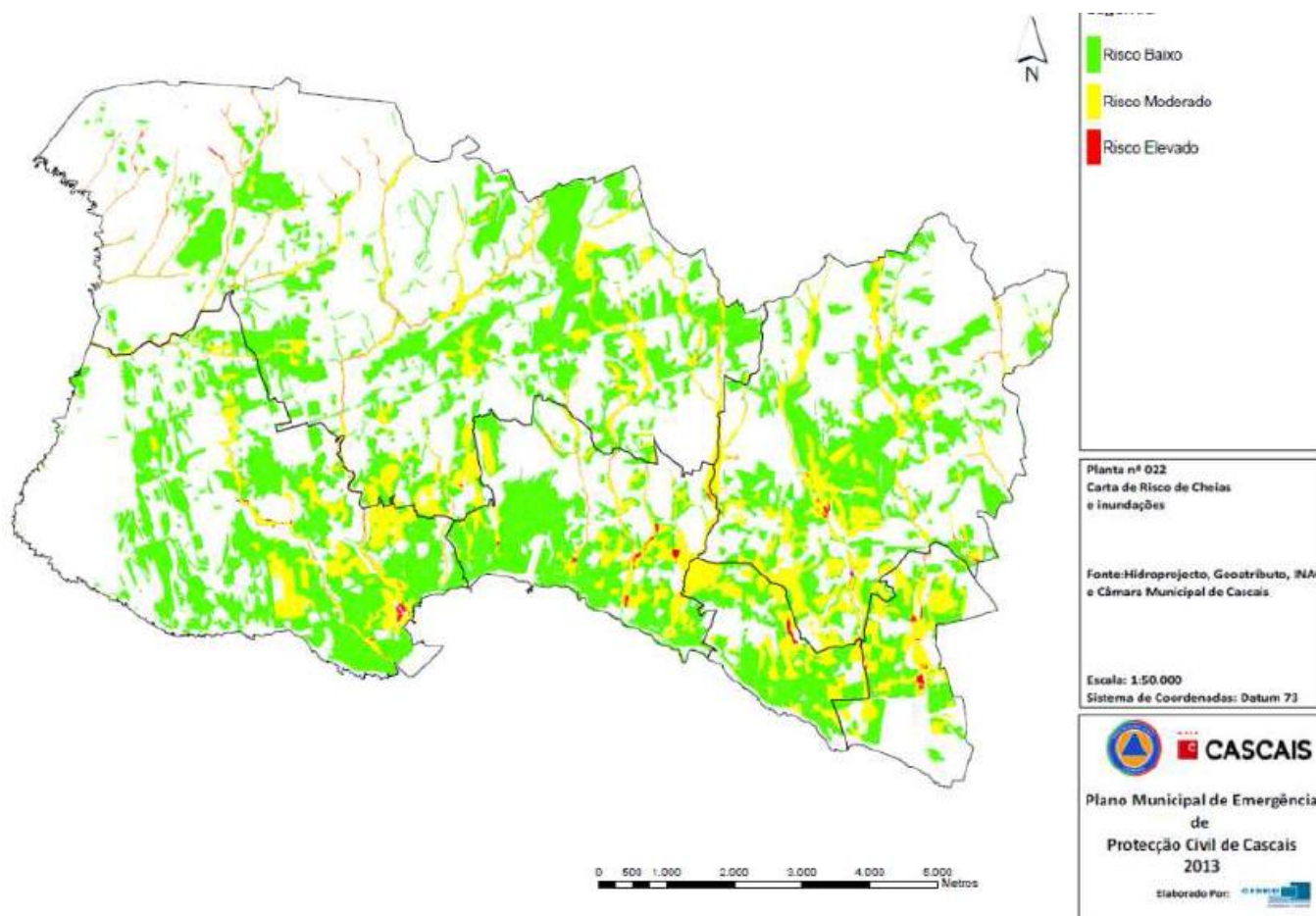
### e) Step 1 – Preliminary Risk Assessment and identification of adaptation tipping points (max 1500 words)

*(some of these questions might be already answered in section 1 – if so, just copy&paste)*

**What is the climate change related problem/risk you would like to reduce by adaptation?**

- Which problems already exist, what is/are the current risk/s?
- Which assets and sectors are at risk under current climate variability?
- Which adaptation or protection measures are already in place? (refer to typology of measures in D6.1, table 2)
- How do these risks presumably change due to climate and socio-economic change?
- What are the main drivers, impacts and affected sectors (refer to BASE impact and sector categories, see also Table 1 of D6.1)
- Which climate and socio-economic scenarios are used?

According to all the information available – PECAC; PMEPC – for the Municipality of Cascais the major climate change-related risk concern: droughts; floods; extreme weather events; and heat waves.



#### Which adaptation tipping points can be identified?

- Can adaptation tipping points, critical levels for adaptation, be defined for this current strategy? (=when objectives are not met anymore due to changes)  
Refer to otherwise expand on Table 3 of D6.1
- When (roughly) will these critical levels be reached due to climate change or socio-economic change
- Give appropriate period (2015-2030, 2030-2050, after 2050) for each considered combination of climate and socio-economic scenario.

#### f) Step 2 – Identification of Adaptation Measure and Adaptation Pathways (max 1500 words)

*(some of these questions might be already answered in section 4 – if so, just copy&paste)*

### **What are the alternative adaptation measures?**

- What are the primary and secondary objectives of adaptation?
- What are potential measures to meet these objectives?
- (refer to typology of measures in D6.1, table 2)
- What is your baseline option (the “business-as-usual”-option)?
  - What is the ambition level of this baseline strategy?: Maintaining current risk levels or current protection levels (implying with CC risks may increase)?
  - Is current backlog of investments for adaptation measures included or excluded?
  - Does it include only planned adaptation or also autonomous, non-planned adaptation?
- Are there complementary measures? Is it appropriate to bundle these measures?

### **What are alternative adaptation pathways?**

- What is the “sell-by”-date of the measures or bundles of measures? I.e. when will they – under conditions of climate change – not any longer be able to meet the defined objectives?
- What would be alternative measures or bundles of measures at these “tipping points”?



## h) Step 3 - Evaluation Criteria and Method (max 2000 words)

### i) Step 3a Selection of evaluation criteria

**Which evaluation criteria should be used?**

- What are the relevant positive and negative properties of the measures (costs and benefits) to be considered in the evaluation process (economic, ecological and social effects)?
- (see D4.1, chapter 4 for examples)
- What is the appropriate unit to measure each of these criteria? Is the performance of the adaptation options measured in qualitative, monetary or other quantitative terms?

j)

### k) Step 3b Selection of evaluation method(s)

**What is the appropriate evaluation method?**

- Is it possible to express all relevant cost and benefit criteria in monetary terms?  
(→ cost-benefit analysis)
- Is it possible to express the positive effect (objective) by a single non-monetary indicator?  
(→ cost-effectiveness analysis)
- Are there several relevant criteria which cannot or cannot easily be expressed in monetary terms?  
(→ multi-criteria analysis, PCBA)

l)

m)

### n) Step 3c Weighting of evaluation criteria (applicable only to multi-criteria analysis)

**What are the preferences of stakeholders regarding the different evaluation criteria?**

- Are there different stakeholder groups with varying preferences regarding the evaluation criteria?
- Which weight do stakeholders and/or decision makers attach to a substantial change in the performance of the adaptation options regarding each evaluation criterion?  
(see D4.1, chapter 4.10.2 for guidance for the Swing-Weight method)

## o) Step 4 - Data collection (max 2000 words)

### **What are the costs and what are the benefits of the alternative adaptation options?**

- What potential data sources are available, including damage & impact assessment methods or existing CBA studies on adaptation measures?
- If no relevant data sources are available and modelling cannot be undertaken: Which experts can estimate proxies for assessing the performance of measures regarding the respective criterion?
- How do the adaptation options perform with regard to each of the cost and benefit criteria selected in step 3a?

### **What is the evaluation time frame?**

- What is the lifespan of the measure with the longest lifetime?

### **Which discount rate should be applied?**

- Which discount rate is recommended by national guidelines for climate change adaptation measures (or public investments)?
- Is it a linear discount rate or any other type (i.e. declining, hyperbolic, etc.)
- (In addition, for testing the sensitivity of the results with regard to the discount rate(s) used, also apply a low and high discount rate (1% and 5%).)

### **How to deal with data uncertainty?**

- Can uncertainties related to the performance of the measures regarding certain evaluation criteria be described by a range (min-max), a triangular distribution (min, most likely, max) or any other kind of probability distribution?

## p) Step 5 – Evaluation and Priorization (max 1500 words)

**What is the ranking order of alternative adaptation options (measures, bundles of measures or pathways)?**

- For cost-benefit analysis:  
What is the net-present value (discounted benefits – discounted costs) of the alternative options?  
What is the benefit-cost ratio?
- For cost effectiveness analysis:  
Which alternative achieves a defined objective at lowest costs?  
What is the cost-effectiveness ratio?
- For multi-criteria analysis:  
Which adaptation option performs best?  
(e.g. for PROMETHEE approach: which option has the highest net flow?)
- What are the uncertainties associated with the performance of the different options?
- Is there and, if so, to what extent uncertainty in the ranking of options?
- Is it possible to determine which option most likely performs best or is it necessary to gather further information to reduce uncertainty (go back to step 4)?

## 6. Implementation Analysis – Understanding, Leadership and Governance of the implementation of adaptation measures

(Please describe the process of implementation of adaptation measures in real world contexts, namely key barriers and opportunities, governance dynamics and the concrete use of scientific knowledge and economic analysis in political decision-making. Please address Policy Questions from WP2&7 on the CSLD\_Support doc)

## 7. References