



LIFE08 ENV/IT/436

PROJECT ACT

ADAPTING TO CLIMATE CHANGE IN TIME

Setting the framework at European and Member States level

(F. Giordano, R. Mascolo)

Workshop Life – Rome, 20.07.2010

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CONTENTS

1. EU Policy Framework on Adaptation

2. EU WHITE PAPER: Objectives and Actions

3. National Adaptation Strategies in the Member States

EU POLICY FRAMEWORK ON ADAPTATION

Even if the world succeeds in **limiting and then reducing GHG emissions**, we will be faced with the impact of climate change for at least the **next decades**.



Need for Adaptation at EU Level

- ◎ **CROSS-BORDER DIMENSION:** the impacts of climate change transcends the boundaries of individual countries (i. e. river and sea basins and biogeographic regions);
- ◎ New framework for **SOLIDARITY:** European regions affected in different way;
- ◎ **COORDINATION:** exchange of best practices between Member States on climate.



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EU POLICY FRAMEWORK: THE MILESTONES



© **October, 2005: ECCP II** “*European Climate Change Programme*” – Working Group on Impacts and Adaptation

© **June, 2007: GREEN PAPER** “*Adapting to climate change in Europe – options for EU action*”, which outlines the risks climate change poses to Europe and makes recommendations for how adaptation should take place at the European, national and local levels.

© **July, 2007: a PUBLIC DEBATE on adaptation** was launched in order to gather concerns and suggestions for changes and improvements. At the end of July, a **WEB-BASED PUBLIC CONSULTATION** was initiated.



© **Autumn, 2007: 4 REGIONAL WORKSHOP** (Finland, Portugal, the UK and Hungary)

© **May, 2008: STAKEHOLDER CONFERENCE** in preparation of a **WHITE PAPER**.

© **April, 2009: Adoption of the WHITE PAPER.**



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EU WHITE PAPER: OBJECTIVES

Adapting to climate change: Towards a European framework for action

◎ **OBJECTIVES:** to improve the EU's resilience to cope with the impacts of climate change through a **phased approach:**

PHASE 1 (2009-2012)

- strengthening the KNOWLEDGE BASE on climate vulnerability and on the costs and benefits of adaptation options;
- ensuring early implementation of no-regret and win-win measures by MAINSTREAMING ADAPTATION into EU policies;
- employing a combination of POLICY INSTRUMENTS to ensure effective delivery of adaptation;
- stepping up INTERNATIONAL COOPERATION on adaptation.

PHASE 2 (2013)

Implementation of a comprehensive EU ADAPTATION STRATEGY.



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EU WHITE PAPER: ACTIONS (EU and MS)



DEVELOPING THE KNOWLEDGE BASE:

By 2011:

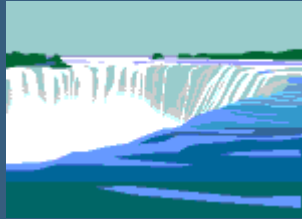
- Establishment of the Clearing House Mechanism in order to facilitate the collection and dissemination of scientific information on climate change impacts and vulnerability, and adaptation policies and measures; and to assist an effective uptake of this knowledge by international, EU, national, regional, local or sectoral decision makers.
- Develop **methods, models, data sets** and **prediction tools**.
- Develop **indicators** to better monitor the impact and vulnerability of climate change, and progress on adaptation.
- Assess the **cost and benefit** of adaptation options.



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EU WHITE PAPER: ACTIONS (EU and MS)



INTEGRATING ADAPTATION INTO EU POLICIES:

The aim is to review all sectoral policies (2009-2012) to determine the potential impacts of climate change in the sector, the costs of action and inaction and how proposed measures interact with policies in other sectors.

- 3 Discussion Papers: **water coasts and marine ecology, agricultural and health issues** (priorities for action).
- Water Directors of EU Member States adopted in December 2009 a **Guidance document on adaptation to climate change in water management** to ensure that the River Basin Management Plans (RBMP) are climate-proof.



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EU WHITE PAPER: ACTIONS (EU and MS)



FINANCING:

- Estimate **adaptation costs** for relevant policy areas so that they can be taken into account in future financial decisions;
- Further examine the potential use of **innovative funding measures** for adaptation;
- Explore the **potential for insurance and other financial products** to integrate adaptation measures and to adopt them as risk sharing instruments.



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EU WHITE PAPER: ACTIONS (EU and MS)



INTERNATIONAL COOPERATION:

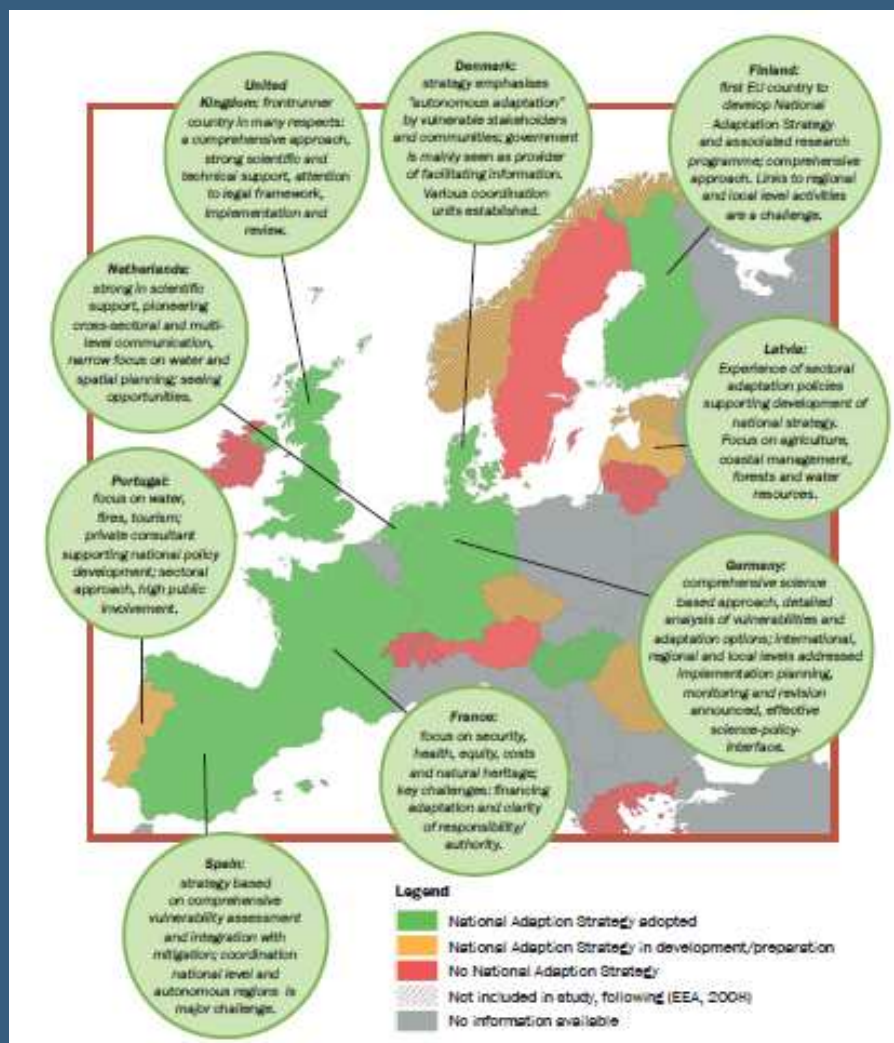
- Establishment of an **Impact and Adaptation Steering Group (IASG)** to set up cooperation on adaptation
- Encourage the further development of **National and Regional Adaptation Strategies** with a view to considering **mandatory adaptation strategies from 2012**
- Step-up efforts to mainstream adaptation into all EU **external policies**



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NATIONAL ADAPTATION STRATEGIES IN THE MEMBER STATES (1)



ADOPTED

2005: Finland

2006: France, Spain

2008: Denmark, Hungary, The Netherlands, United Kingdom, Germany, Norway

2009: Sweden

Source: EEA website.

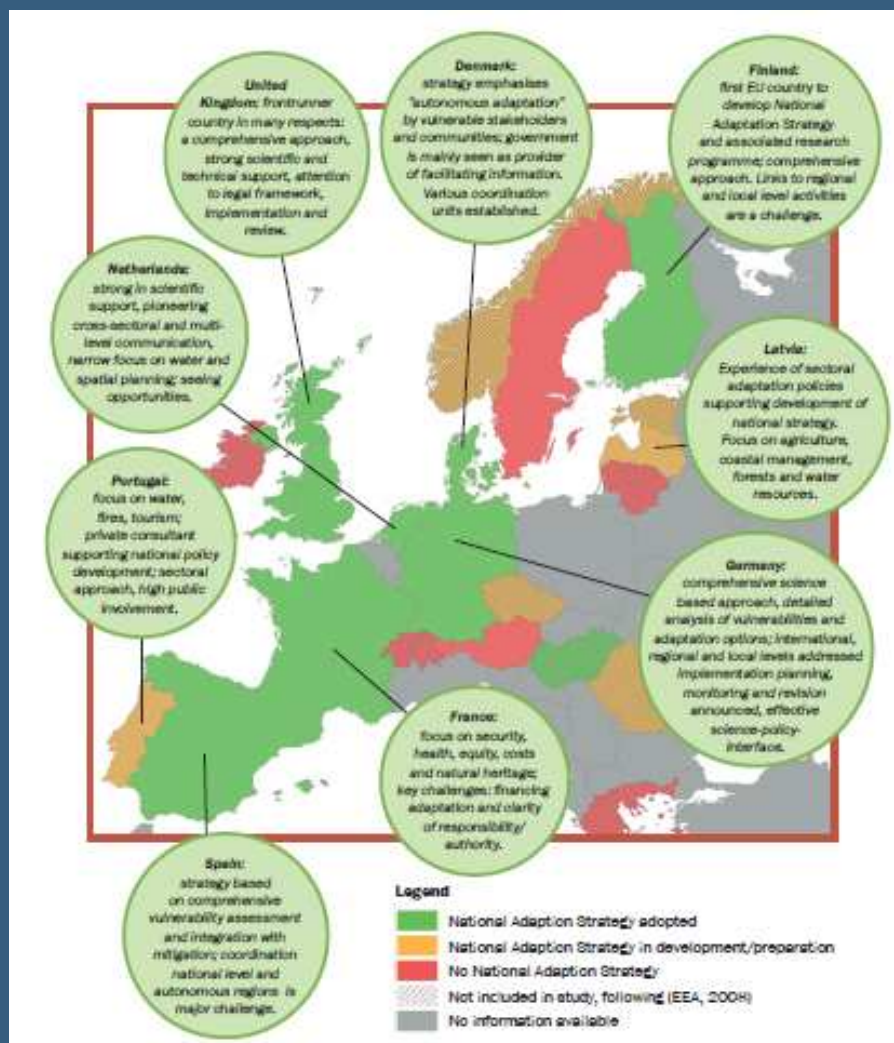
Source: *Europe adapts to climate change - Comparing National Adaptation Strategies*. PEER, 2009



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NATIONAL ADAPTATION STRATEGIES IN THE MEMBER STATES (2)



EXPECTED

In progress: Estonia, Ireland, Latvia, Portugal

2011: Austria

2012: Belgium

Source: EEA website.

Source: *Europe adapts to climate change - Comparing National Adaptation Strategies*. PEER, 2009



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Learning from existing Regional/Local Guidelines, Strategies and Plans

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CONTENTS

- 1. Strategies and Plans: key definitions**
- 2. State of the Art Review: Methodology**
- 3. PART I: Guidelines for Regional and Local Adaptation**
- 4. PART II: Regional and Local Adaptation Strategies and Plans**
- 5. Conclusions**

STRATEGIES AND PLANS: KEY DEFINITIONS

ADAPTATION STRATEGY: **general plan of action** for addressing the impacts of climate change [...]. It may include a **mix of policies and measures**, selected to meet the overarching objective of **reducing the country's vulnerability** [...] (UNDP).

...**principles and criteria** in order to set up the framework for the analysis of impacts and the Adaptation Plan...(Canarias)

...**dynamic process** involving **public and private stakeholders**... (Aragon)

...definition of a **framework** that will allow **to prioritise lines of action**... (Aragon)

...the **establishment of lines of action** that will favour the definition of **concrete measures and more appropriate programs**...(Zaragoza)



...PLAN OF ACTION...**how, when and by whom specific adaptation measures** should be implemented...by **key actors** in order to ensure a sustainable future for the region (Ribeiro M. et al.).



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STATE OF THE ART REVIEW: METHODOLOGY

OBJECTIVE:

To collect and analyse the most relevant initiatives implemented on adaptation at regional and local level

PART I: FROM THEORY
Guidelines for Regional and Local Adaptation

PART II: TO PRACTICE
Regional and Local Adaptation Strategies and Plans

KEY ELEMENTS:

Approaches, Best practices, Methodologies, Models, Indicators,

KEY ASPECTS:

Strength, Weaknesses, Needs, Barriers, Opportunities

OUTCOMES:

To go beyond the current state of the art so that new communities can benefit from these experiences and provide some initial **key FEATURES for a Local Adaptation Strategy/Plan.**

PART I: FROM THEORY

- Guidelines for Regional and Local Adaptation -



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FROM THEORY: REGIONAL AND LOCAL GUIDELINES FOR ADAPTATION

GUIDANCE DOCUMENT	COUNTRY	LEVEL OF GOVERNANCE
<i>UK Climate Impacts Programme – Adaptation Wizard</i>	United Kingdom	All levels
<i>Preparing for Climate Change: A Guidebook for Local, Regional and State Governments</i>	ICLEI	All levels
<i>Guidance on Formulating an Adaptation Strategy</i>	UNDP	All levels
<i>Design of guidelines for the elaboration of regional climate change adaptation strategies</i>	Europe	Regional
<i>The Nottingham Declaration Action Plan</i>	United Kingdom	Local

- 3 Guidances for the various levels of governance
- 1 Guidance for the Regional level
- Only 1 example of guidance specific for the local level

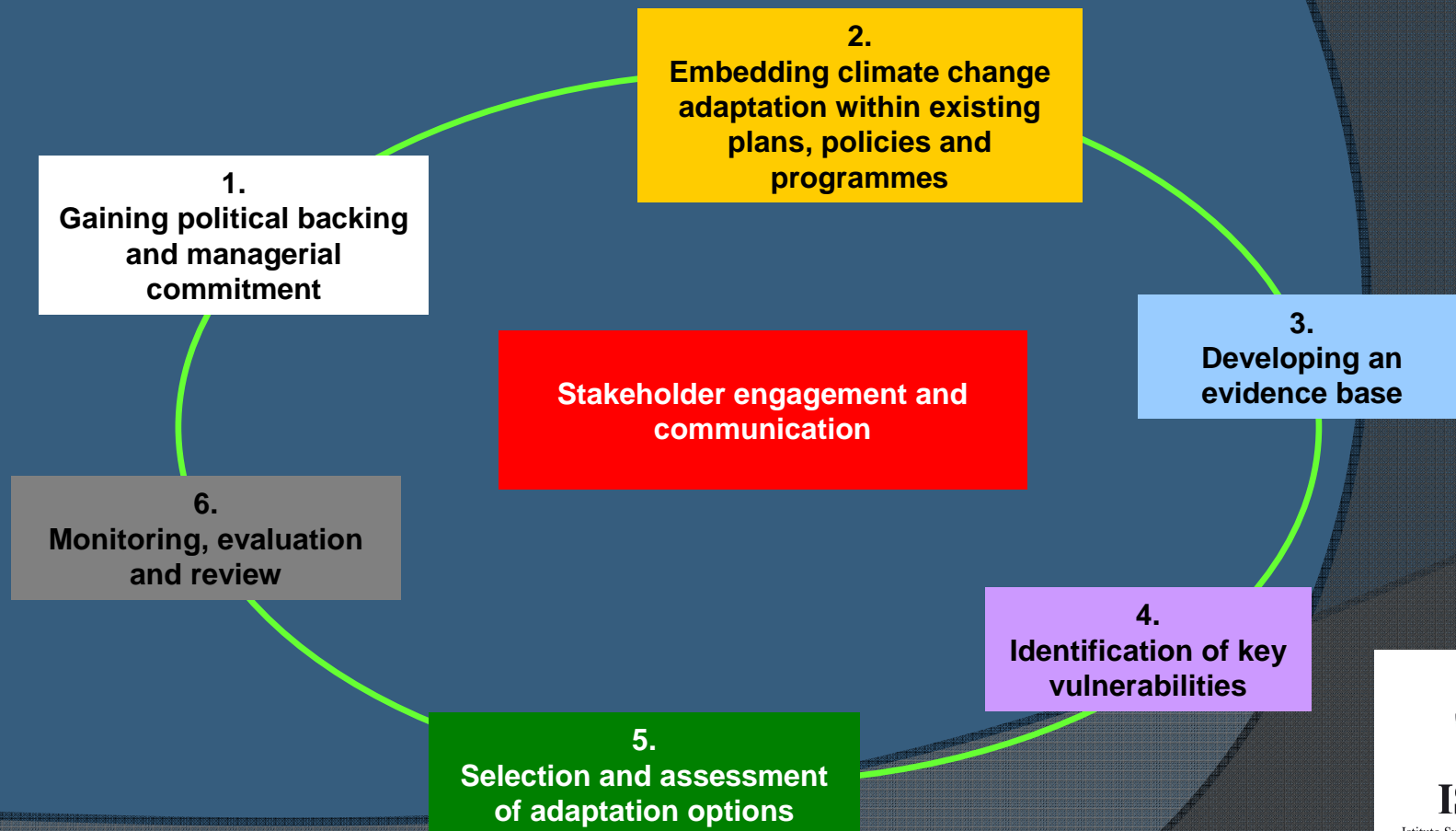


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FROM THEORY: REGIONAL AND LOCAL GUIDELINES FOR ADAPTATION – KEY FEATURES

Building on the review of selected guidance documents the following **key features** for the elaboration of **Regional/Local Adaptation Strategies and Plans** were identified and analyzed:



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GAINING POLITICAL BACKING AND MANAGERIAL COMMITMENT



The first step in developing an Adaptation Strategy is the establishment of **cross-departmental team**.

Early and long term commitment of **executive leaders** in the administration to the objective of preparing the Adaptation Strategy. Time spent in building support can be invaluable in delivering **successful outcomes**.

LEADER and a **CORE TEAM** will have to perform:

- **goals;**
- **climate vulnerability study;**
- **priority planning areas;**
- **stakeholder process;**
- **communication plan;**
- **measure, monitor, review;**
- ...

(ICLEI, 2007)

...to secure a **MEETING** with **executive leaders** and present a **BRIEF**:

- **evidence and reasons of climate change;**
- **what is likely to happen in your territory;**
- **the benefits** of an Adaptation Strategy.

(Nottingham Declaration Action Plan)



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STAKEHOLDER ENGAGEMENT AND COMMUNICATION (1)



Stakeholders are central to the adaptation process. The **principal resource** for responding to climate change impacts is **people**, their **knowledge**, **expertise** and **willingness** to find solutions.

*The involvement of stakeholders will be essential throughout the **whole Adaptation process**. The **composition of the stakeholder group** may change as the types of activities change. **KEY STAKEHOLDERS** in climate change (UNDP, 2004):*

- **Policy makers;**
- **Scientists;**
- **Administrators;**
- **Communities/People affected/vulnerable** to climate change risks;
- **Managers** in the economic sectors;
- **NGOs.**



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STAKEHOLDER ENGAGEMENT AND COMMUNICATION (2)



There are a great **number of approaches and techniques** to stakeholder engagement.

NO SINGLE FORMULA FOR SUCCESS!

Rather, there are **combinations of tools and techniques** that will be well-suited to a given situation.

The different levels of participation can be illustrated using the “**LADDER OF PARTICIPATION**” (UNDP, 2004):

- **Self-mobilization:** stakeholders take the initiative;
- **Interactive participation:** common goal to achieve;
- **Consultation:** stakeholders will be asked for views on proposals;
- **Participation in giving information:** stakeholders generates information but that is all.



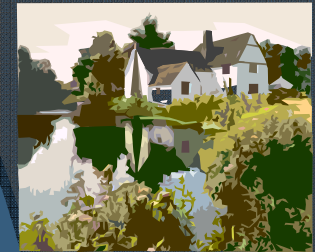
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EMBEDDING CLIMATE CHANGE ADAPTATION WITHIN EXISTING PLANS, POLICIES AND PROGRAMMES

3 reasons for **mainstreaming climate change adaptation** at **local level**:

- 1) CC impacts are manifested **locally**, affecting **local** livelihood;
- 2) Vulnerability/Adaptive capacity determined by **local** conditions;
- 3) Adaptation is often best observed at the **local** level.



VISION, TARGETS, ACTIONS, should be embedded into sectoral annual plans and policies of departments that are responsible for implementation.

(Nottingham Declaration Action Plan)

SEA (Strategic Environmental Assessment): tool for assessing the potential implications of plans and programmes on the environment and for integrating environmental issues into the planning process at an early stage.

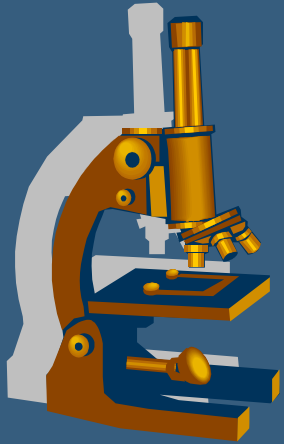
(Ribeiro et al, 2009)



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DEVELOPING AN EVIDENCE BASE (1)



A robust Adaptation Strategy will be based on **sound science** on **how climate is expected to change in the region** – a fundamental and ongoing part of preparing for climate change impacts.

*How could climate change affect my region?
Which impacts will pose a risk for my community?*

TYPES OF INFORMATION you will need to collect and organize:

- **projections** of climate variables;
- information about **how climate change will vary seasonally**;
- **range of climate change** that the community could experience.

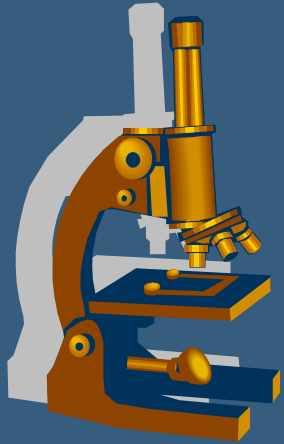
(ICLEI, 2007)



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DEVELOPING AN EVIDENCE BASE (2)



Dealing with little information will represent one of the main challenge in developing the evidence base. One option could be to look at how sensitive the community has been to **past** and is to **current climate change**.

Possible **SOURCE OF INFORMATION** could be:

- Peer-reviewed **assessment reports, articles**;
- Conference **proceedings**;
- **Questionnaire** to gather relevant information;
- Specific **workshop**;
- **Interviews** to experts;
- Information from **broader-scale studies**;
- **Examples** from other regions.

(ICLEI, 2007)



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IDENTIFICATION OF KEY VULNERABILITIES (1)



The identification and characterization of the way in which **human and natural systems are vulnerable** to climate change become **key inputs** for adaptation **measures and policies**.

VULNERABILITY = f(Character, Magnitude, Rate of climate change, Exposure(+), Sensitivity(+), Adaptive capacity(-))

SYSTEMS:

- *a region;*
- *a community;*
- *a population;*
- *an ecosystem;*
- *an economic sector.*

(UNDP, 2004)

It is not only the level of **exposure** to climate change that makes systems vulnerable, but also their **sensitivity** to those changes and their **capacity to adapt** to avoid negative consequences. Also **non-climatic stresses** could shape vulnerability of a system.



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IDENTIFICATION OF KEY VULNERABILITIES (2)

- Adaptive capacity -



Systems that have high **adaptive capacity** are better able to cope with climate change impacts.

Adaptive capacity development as a **central goal** of most adaptation strategies.

INDICATORS of adaptive capacity are difficult to identify, as adaptive capacity is not directly measurable. Appropriate indicators may be tailored to each case (UNDP, 2004).

GUIDING QUESTIONS (ICLEI, 2007):

- Are the systems **already able to accommodate changes in climate?**
- Are there **barriers** to a system's ability to accommodate changes in climate?
- Is the **rate of projected climate change** likely to be faster than the adaptability of the systems?

KEY FACTORS:

- **access and ability to process information;**
- **resources** to invest in adaptation;
- **flexibility** of system to change in response to climate stimuli;
- **willingness** to change and adapt;

(Ribeiro et al., 2009)



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IDENTIFICATION OF KEY VULNERABILITIES (3)

- Socio-economic context -



Understanding the **socio-economic patterns** of any system is essential for adapting to climate change.

The challenge is to develop **adaptation strategies appropriate to the societies of the future.**

Characterizing **CURRENT SOCIO-ECONOMIC conditions** will help develop an **adaptation baseline**:

- **demography;**
- **economy;**
- **natural resources use;**
- **governance and policy;**
- **culture.**

(UNDP, 2004)

SOCIO-ECONOMIC SCENARIOS provide plausible descriptions of what society might be like in the future and can help to show whether **society will become more or less capable of adapting to climate change** (Ribeiro et al., 2009).



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IDENTIFICATION OF KEY VULNERABILITIES (4)

- Vulnerability assessment -



The **vulnerability assessment** could be one of the **more research-intensive phases** of the planning process.

The **VULNERABILITY ASSESSMENT** can be **QUALITATIVE** (high, medium, low) and/or **QUANTITATIVE** depending on the type of information and the amount of resources available (ICLEI, 2007).

Planning area	Current and expected stresses	Projected climate change impacts	Degree of sensitivity	Adaptive capacity	Vulnerability
Water supply	Managing summer drought	More drought, summer water stress	High	Low	High

Illustration of a qualitative assessment (ICLEI, 2007).

Other **qualitative tools** for vulnerability assessment could include (UNDP, 2004):

- **Expert judgement;**
- **Stakeholders consultation;**
- **Focus groups.**



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IDENTIFICATION OF KEY VULNERABILITIES (5)

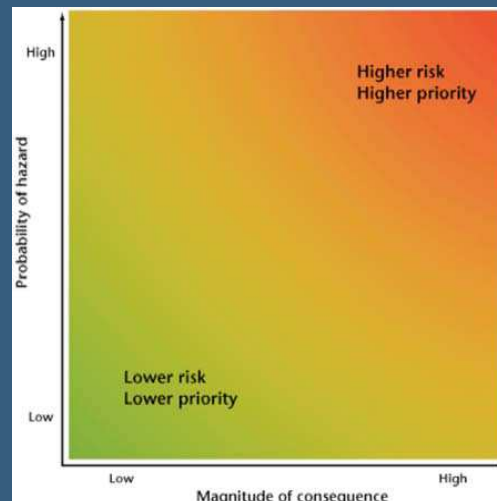
- Risk assessment -



Based on knowledge about vulnerabilities of systems, other step will be the **climate change risk assessment** for those systems:

$$\text{RISK} = \text{Consequences} \times \text{Probability}$$

Consequences= estimated intensity of a particular climate change impact;
Probability= how likely is it that a projected impact will occur.



Risk of the potential impacts
(Adaptation Wizard, 2008).



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SELECTION AND ASSESSMENT OF ADAPTATION OPTIONS (1)



After conducting **vulnerability and risk assessment** for the systems, it is time to identify the **priorities for adaptation** on the basis of the previous results.

Priority planning areas – areas of particular importance to the community which are vulnerable to climate change and the associated risks.

The priority planning areas will be the **focus** for the **adaptation actions** and **long-term adaptation plan** (ICLEI, 2007).

	LOW VULNERABILITY	HIGH VULNERABILITY
HIGH RISK	MAY BE PRIORITY	SHOULD BE PRIORITY
LOW RISK	ARE UNLIKELY TO BE PRIORITY	MAY BE PRIORITY

Vulnerability/Risk Matrix for Priority Planning Areas (ICLEI, 2007).



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SELECTION AND ASSESSMENT OF ADAPTATION OPTIONS (2)



Before adaptation measures can be selected, the **range of potential adaptation options** should be evaluated in terms of:

- *their contribution towards achieving the desired **outcome**;*
- *the **economic costs and benefits**;*
- *the **technical feasibility**;*
- *their potential **synergies** with other objectives;*
- ...

ADAPTATION RESPONSES (Adaptation Wizard, 2008):

- **Build adaptive capacity:** *creating the information, supportive social structure, supportive governance, etc;*
- **Reduce vulnerability to climate risks** (*i.e. minimizing exposure to risks or reducing the consequences of the resulting impacts or accepting the impacts and bearing losses*), or to **exploit opportunities**.



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SELECTION AND ASSESSMENT OF ADAPTATION OPTIONS (3)



Not accepting the need to adapt and difficulties in taking decisions are often attributed to the **lack of certainty**. **Uncertainty**, however, should not be used as an excuse for not taking action.

NO REGRETS: *socio-economic benefits exceed their costs whatever the extent of future climate change:*

- **reducing leakage from water utility infrastructure**

(Adaptation Wizard, 2008)

LOW REGRETS: *the associated costs are relatively low and benefits, although primarily realized under projected future climate change, may be relatively large:*

- **promoting the creation and preservation of space in support of biodiversity goals;**

(Adaptation Wizard, 2008)

WIN-WIN: *minimize climate risks or exploit potential opportunities but have also other social, environmental or economic benefits:*

- **improving the cooling capacity of building through less energy intensive cooling strategies;**

(Adaptation Wizard, 2008)

MONITORING, EVALUATION AND REVIEW (1)



M., E. & R. is an important part of any adaptation process. These mechanisms can contribute to a “**learning by doing**” function that will provide insight into **how the adaptation process can evolve most efficiently.**

GUIDING QUESTIONS (UNDP, 2004)

- *How do you demonstrate that your climate change Adaptation Strategy/Plan are truly working to make the community more resilient to climate change?*
- *How do you know if your plan or action is not working, and how it might need to be modified?*

Four recurring steps suggested (ICLEI, 2007):

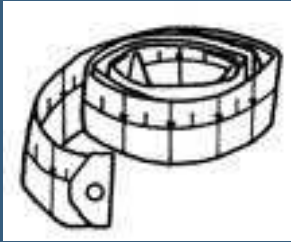
1. *Measure your progress;*
2. *Periodically review your basic assumptions;*
3. *Update your adaptation Plan;*
4. *Share the results of your Plan.*



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MONITORING, EVALUATION AND REVIEW (2)



Measuring the progress on climate change adaptation should happen at various level and for multiple audiences.

*Potential types of **measures of the RESILIENCE of a COMMUNITY:***

- **public awareness** about climate change impacts;
- **technical capacity** to prepare to climate change impacts;
- **mainstreaming of climate change** information and adaptation;
- **adaptive capacity** of built, natural, and human systems;
- **stakeholders engagement** in decreasing vulnerability and risk.

(ICLEI, 2007)



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PART II: TO PRACTICE

- Regional and Local Adaptation Strategies and Plans-

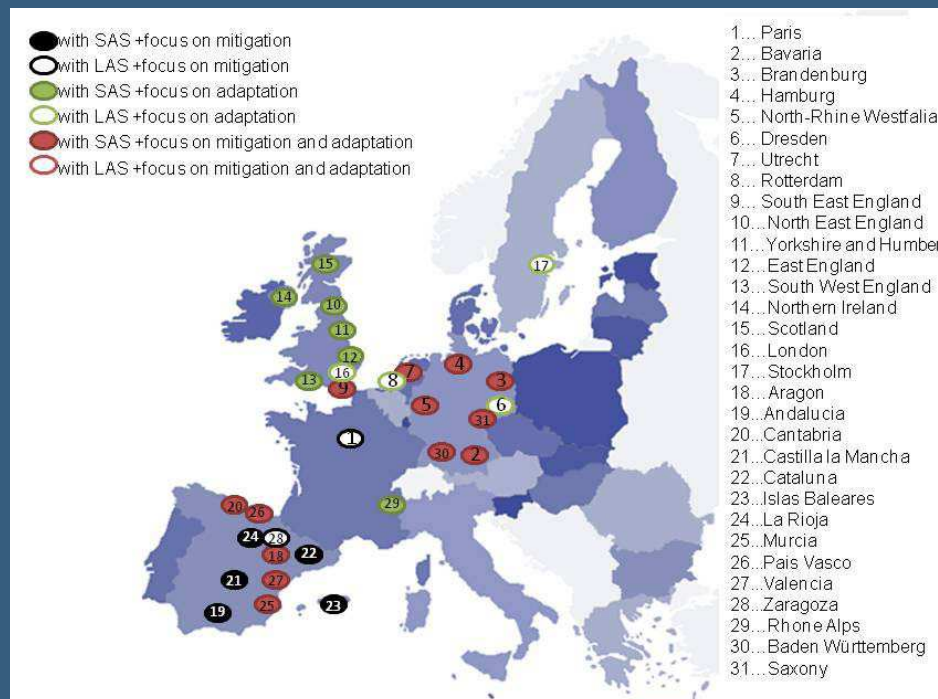


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REGIONAL AND LOCAL ADAPTATION STRATEGIES AND PLANS IN EUROPE (1)

National Adaptation Strategies (NAS) generally provide a **framework** for the development of **Regional and Local Adaptation Strategies (RAS and LAS)**.



Climate change Regional and Local Adaptation Strategies and Plans in Europe (Ribeiro et al., 2009).

2009: 31 RAS and LAS were identified in 6 EU countries:

- Spain;
- Germany;
- The Netherlands;
- UK;
- Sweden;
- France.

Main drivers:

- National Adaptation Strategy;
- Advanced adaptation policies;

Vulnerability is not yet a driver.



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REGIONAL AND LOCAL ADAPTATION STRATEGIES AND PLANS IN THE MEDITERRANEAN (1)

In order to go beyond a simple State of the Art, we performed a **detailed analysis** on the **Mediterranean formally adopted RAS and LAS**.

Mediterranean RAS and LAS: **approaches, methodologies, tools, indicators, best practices** and **measures** adopted in context of our interest.

13 Mediterranean (Spanish) RAS and LAS were selected:

REGIONAL ADAPTATION STRATEGIES (RAS)

1. Estrategia Aragonesa de Cambio Climatico y Energias Limpias
2. Estrategia Canaria de Lucha contra el Cambio Climatico
3. Estrategia de Accion frente al Cambio Climatico en Cantabria
4. Estrategia de Cambio Climatico para Extremadura
5. Estrategia de la Region de Murcia frente al Cambio Climatico
6. Estrategia Valenciana ante el Cambio Climatico
7. Pacto Regional contra el Cambio Climatico de Castilla-La Mancha
8. Plan Andaluz de Accion por el Clima
9. Plan de Accion del Gobierno de Aragon
10. Plan de Accion por el Clima en Navarra
11. Plan Vasco de Lucha Contra el Cambio Climatico

LOCAL ADAPTATION STRATEGIES (LAS)

1. Estrategia Local frente al Cambio Climatico del Municipio de Murcia
2. Estrategia de Adaptacion al Cambio Climatico de Zaragoza

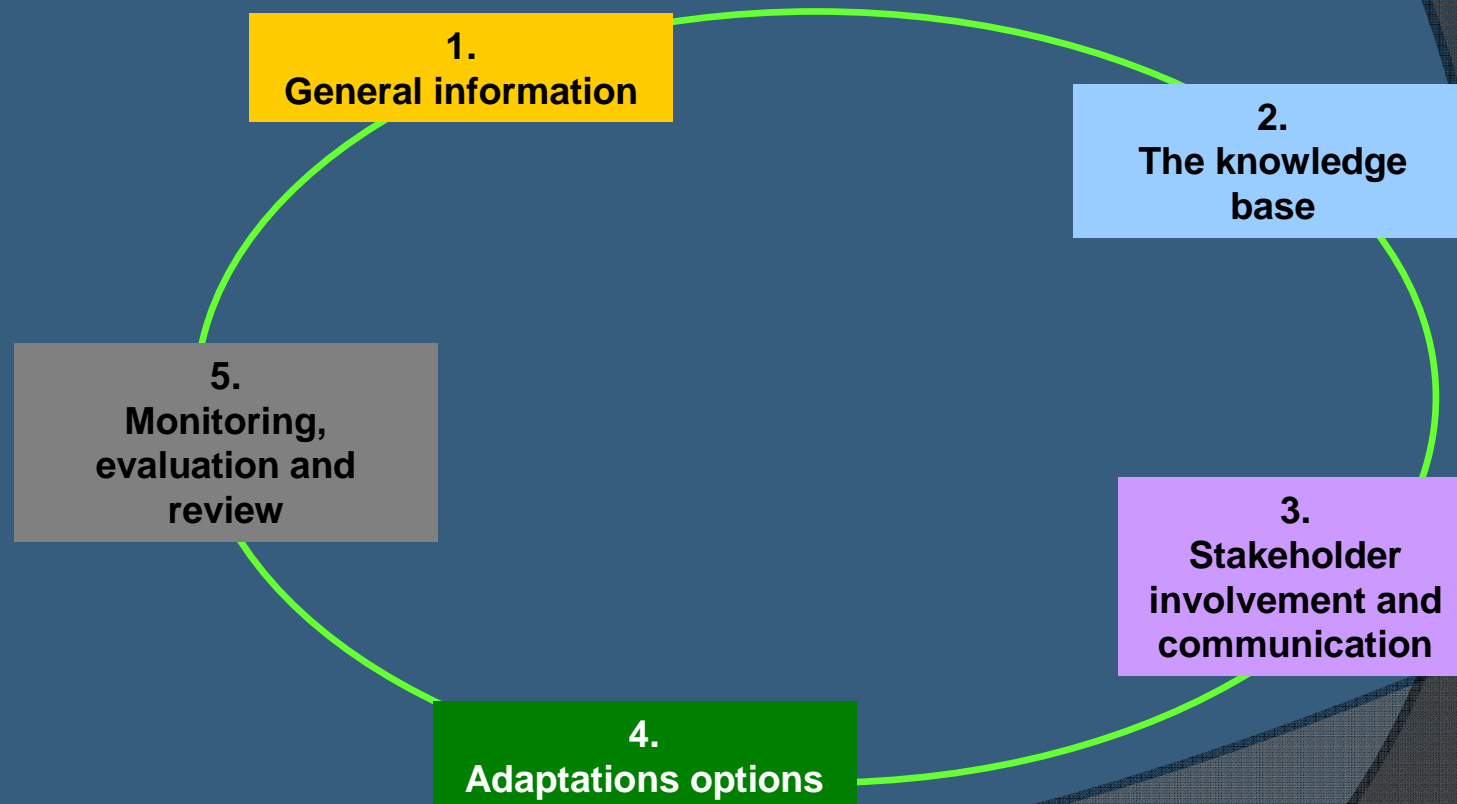


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REGIONAL AND LOCAL ADAPTATION STRATEGIES AND PLANS IN THE MEDITERRANEAN (2)

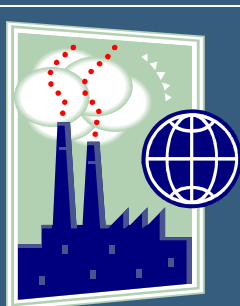
Based on the information available through a **simple desk review**, the following **key features** were investigated:



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GENERAL INFORMATION



APPROACHES: In general Strategies and Plans include both **Mitigation** and **Adaptation** sections.

Synergies between M&A should be explored.

Main OBJECTIVES of RAS and LAS:

- to increase of **knowledge** and **awareness**;
- to involve **social** and **economic agents**;
- to promote **Research, Development** and **Innovation**;
- to be **pioneer** in the development of solutions;
- to **integrate adaptation** into sectoral planning.

WEAKNESS:

- **Lack of clear targets** linked to specific objectives. This may reduce the chance of *maladaptation* and will be key for monitoring and evaluation.



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THE KNOWLEDGE BASE FRAMEWORK (1)

Main SOURCE of INFORMATION:

- **International** framework (i.e. IPCC, EEA);
- **National studies** (i.e. National Agency of Meteorology, Preliminary assessment of impacts in Spain)



SOCIO-ECONOMIC CONTEXT

Some appropriate **indicators:**

- *participation of agriculture in the regional economy;*
- *value of aquaculture and fisheries.*

Socio-economic scenarios:

- **Regional Plan of Andalusia:** scenarios of population and economic growth

WEAKNESSES:

- **climate change and impact scenarios** developed at broader scale;
- limited consideration of the **socio-economic scenarios;**
- **methodologies** and **models** used are not often described.



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THE KNOWLEDGE BASE FRAMEWORK (2)

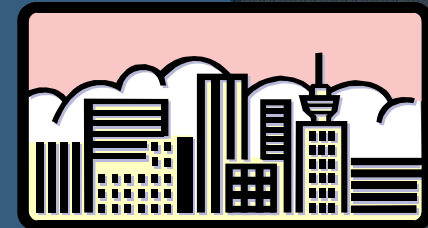
Main systems/sectors analyzed:

- Terrestrial and marine ecosystems;
- Forestry;
- Coastal areas;
- Soil;
- Natural risk;
- Health;
- Water resources;
- Agriculture;
- Livestock and Fisheries;
- Energy;
- Tourism.



Systems/sectors analysed in some cases:

- Assurance;
- Building sector;
- Urban planning;
- Infrastructure.



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STAKEHOLDER INVOLVEMENT AND COMMUNICATION



Many RAS and LAS **acknowledge** that **successful adaptation** requires **stakeholder involvement and communication** of information.

WEAKNESSES:

- few RAS and LAS elaborated and implemented descriptive **communication plans**;
- rare description of approaches used to **involve stakeholders**;

BASQUE PLAN:

Detailed description concerning the methods for **stakeholder involvement**:

- coordinated and continuous participation process;
- differentiated tools for different stakeholders and different responsibilities;
- dynamic participatory process.



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ADAPTATION OPTIONS

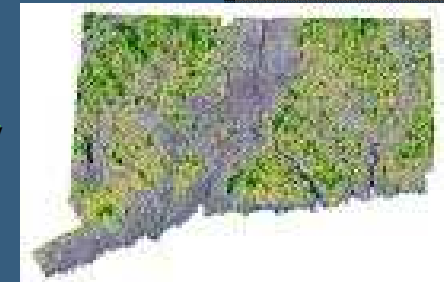
Adaptation options focus in general on **building adaptive capacity**. Most of the actions relate to **finance and coordinate research and communication** of results to the population.



**Information campaigns at school
(CANARIAS)**

...BUT ALSO...

**Preservation of ecodiversity
(ARAGON)**



WEAKNESSES:

- **lack of methods and criteria** used to select and prioritize the measures;
- **lack of economic assessments** of adaptation options.



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MONITORING, EVALUATION AND REVIEW

In most cases **monitoring mechanisms** were performed through **appropriate indicators** in order to evaluate the **effectiveness of the actions** implemented and to assess the **degree of progress** towards the achievement of the objectives.

INDICATORS

- N of research projects carried out on vulnerability, on the effects of climate change;
- N of plans, programs and projects that integrate climate change;
- N of students involved in training activities;
- Budget for awareness campaigns;
- N of buildings with bioclimatic criteria;
- N of campaigns organized;

WEAKNESS:

- RAS and LAS **lack of quantitative targets**. Research for functional adaptation indicators is still at its outset.



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CONCLUSIONS (1)

- The review of existing regional and local adaptation strategies allowed capturing **COMMON FEATURES** and identifying **GAPS and NEEDS**;
- To date there are **MANY UNCERTAINTIES** about the way how climate will change in Europe, how those changes will affect people, natural systems and socio-economic sectors. Also uncertainties concern the best way to adapt to the future climate;
- Climate change adaptation therefore oblige to take decisions with incomplete and evolving information and to build an adaptation **FLEXIBLE PROCESS** to a range of climate change scenarios;

CONCLUSIONS (2)

- A major research effort would therefore be needed in order to timely provide a **sound and POLICY-RELEVANT KNOWLEDGE BASE**;
- **MAINSTREAMING ADAPTATION** into sectoral policies still remain a challenge for the future policy implementation;
- Adaptation process will be successful only by operating in close **COORDINATION with KEY STAKEHOLDERS.**

Since we have not reduced our contribution to the problem of climate change, we are all forced to prepare for climate change effects today, without waiting for tomorrow...

THANKS!

ευχαριστίες!

GRAZIE!

GRACIAS!