

## Summary

The work of the interministerial group 'Impacts of Climate Change, Adaptation and Associated Costs for France', which met between March 2007 and October 2009, led to a sector-based assessment of all climate change related impacts and of associated adaptation measures. The aim was to obtain quantified elements that could underpin public policy decision-making and especially development of the National Adaptation Plan. While the sectoral analyses focused on quantifying the costs of adaptation, the approach of the 'Territories' group, co-steered by the *Datar* (regional development delegation) and *Ademe* (agency for energy management and environment), addressed the subject of interactions between players and activities, both spatial (sharing of resources between different uses, etc.) and temporal (transition from one situation to another, etc.) and the corresponding means for adjustment.

It was in this context that the SOeS proposed a methodology for diagnosis of the socio-economic vulnerability of a given sub-national territory in the face of climate change. This document provides a broad-brush outline of the accompanying guidelines developed by Sogreah Consultants SAS for use by local players. The full study report is available on-line at: <http://www.stats.environnement.developpement-durable.gouv.fr/>

### Supporting guidelines for sub-national territories, why and for whom?

The guidelines – based on the identification of economic activities that are the structuring factors for the territories considered – are intended to provide a 'toolkit' for local players wishing or having to engage in assessment of the impacts of climate change: in particular, the guidelines provide summarising matrices that cross refer different environments and economic activities in order to pinpoint specific points of vulnerability.

Use of the guidelines is not intended to replace a full vulnerability study. It should rather be viewed as an initial step that permits:

- indication of activities and players affected by climate change as well priority issues and pointers for action;
- round-up of the initial elements of a diagnosis for the territory;
- awareness raising and stimulation on the issue.

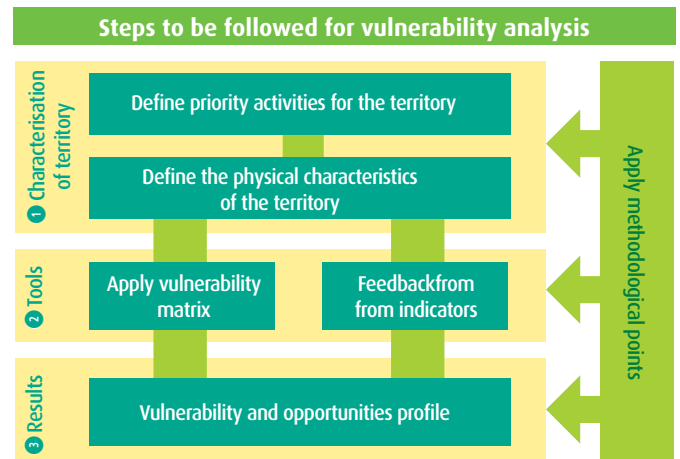
Developed as an underpinning tool for locally based mobilisation, the guidelines contain useful supporting material (description of the approach, bibliography, sources, etc.) that will allow users to analyse potential vulnerability on the basis of the finer understanding they will gain of their territory. They do not propose quantification of the costs of impacts or of adaptation.

**The guidelines do not, *a priori* assume that a 'territory' corresponds to a given institutional perimeter such as an administrative area or municipality;** a territory is viewed here as a socio-political construct in a given natural area. In practice, it is the *'project territory'* from the Scots (territorial coherence schemes), when these exist, that seems to be, potentially, the most operational. The uncertainties surrounding hazards, and therefore impacts, and the availability of climate simulations for the territories studied, in any case impose the necessity of working on a sufficiently large geographical scale.

**A three step approach:** drawing up the vulnerability profile follows three steps indicated in the diagram below.

### Step 1: characterising the territory

This is based on identification of the priority activities and physical features. First, local players are invited to list the **categories of activities** that are of socio-economic importance for the territory; they then select the **physical environments** for which the socio-economic issues are the most pressing.



Source: from the guidelines (original title: *Guide d'accompagnement du territoire pour l'analyse de sa vulnérabilité socio-économique au changement climatique*. Sogreah Consultants, Paris. 183 p. + annexes.

The types of environment covered by the guidelines are those for which the impacts of climate change are the most specific and identifiable: coast, plains and estuaries, mountains, valleys subject to natural hazards, natural areas, forests, and urban (as opposed to rural). A 'general' category is added, to include aspects of vulnerability common to all of the territories, regardless of the characteristics of the physical environment.

The availability of data at the level of the territory in question is a determining factor for this first characterisation step. To assist with this, the guidelines provide a summary table of sources of data available at the territorial level. The issue of interactions must also be considered at this stage, even though it is complex to deal with, in order to complete or correct the selection of priority activities for analysis.

Furthermore, specific treatment is recommended when dealing with particular sensitive areas or environments (such as fragile ecosystems, areas exposed to natural hazards, areas of development of activities affected directly by climate change, etc.).

### Step 2: using the analysis tools

Based on the current climate change literature, the following hazards have been selected, since the impacts resulting from them are the most important:

#### 'Business as usual' development

- increases in average air temperature;
- increases in maximum temperatures;
- changes in rainfall patterns;

- increased water temperatures in rivers and lakes;
- rising sea levels (erosion and permanent flooding);
- less snow (quantity and duration);
- changes in freezing cycles (reduced number, changes in times);
- changed wind conditions;
- changes in solar irradiation (intensity, duration).

**Climatic extremes:**

- drought;
- flooding;
- higher sea water levels (temporary flooding);
- heatwaves;
- earth movements;
- wildfires.

**The vulnerability matrix**

For each category of activity retained, and depending on the physical characteristics specific to the territory, the aim is to produce a detailed analysis of potential impacts: a **matrix** of indices of vulnerability to climate change – qualitative at this stage – is produced per hazard.

Depending on the time-scale chosen, the hazards are different and, as a consequence, so is the resulting level of vulnerability. The horizon chosen for the matrix is the **long term** (approximately: second half of the century, from the present to 2080), more strategically appropriate for the spatial planning issues. Stipulations are added for the medium term (first half of century, 2030/2050), for which studies are still less available currently.

The proposed tool has two parts:

- the actual matrix (activities x physical characteristics of the environment) showing, for each ‘type of environment’ x ‘category of activity’ pair, the level of vulnerability for each type of hazard considered on a **qualitative scale**;
- a description of corresponding potential impacts, linked to bibliographical sources.

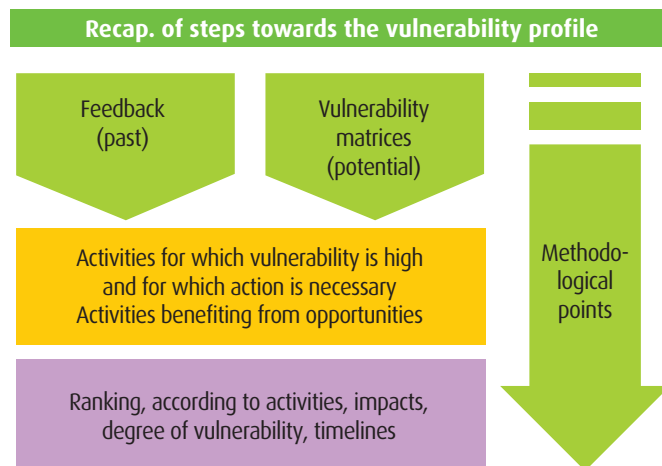
**Feedback**

Second analysis tool: organising feedback consists in analysing the effects of past climate events at the local level for the territory in question (consequences for the territory’s activities, player responses, etc.). The proposed method is based on the Local Climate Impacts Profile (LCIP) used by local authorities in the UK to conduct an initial analysis of their vulnerability. The advantages of this method are, notably, that they foster a practical approach based on observation and common sense that raises both awareness and incentive and that they focus on the vulnerability of the territory to the present-day climate before considering more distant time horizons. Depending on the territories, analyses are either already available or not: for instance, risk prevention plans can provide directly usable analysis for some hazards and impacts.

**Step 3: drawing up an initial vulnerability profile**

Drawing up a profile requires bringing together the information from the matrix and that from feedback: either by activity or group of activities, or by environment, depending on aims. The profile leads to identification of the important issues as well as allowing identification of potential impacts to be studied in more depth.

A first vulnerability and opportunities profile can be drawn up from a summary table of impacts in accordance with the goals the ‘territory’ initially set for this analysis; key points for vigilance that will give rise to more in-depth specific study (e.g. for an impact quantifying exercise) can also be identified. Given the complexity of the issues addressed, the profile is to be considered as a first step in the context of territory-based work on vulnerability and adaptation to climate change.



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**Tests in the regions**

In order to develop a tool with optimum operational capacity, the guidelines were tested in three pilot territories facing different climate change issues: Wateringues, in the Nord – Pas-de-Calais region; GPD cités maritimes in the Languedoc-Roussillon region; and Scot ouest in the Alpes-Maritimes region.

The purpose of this test phase was to provide a real-world example of implementation of an analysis and mobilisation process. It provided a practical illustration of an approach to using the guide as a support for vulnerability analysis as well as allowing identification of users’ questions about application of the guidelines.

**Methodological points**

Throughout implementation of the approach proposed by the guidelines, attention must be paid to several methodological points, especially the following:

- as for all of the interministerial group’s work, scenario known as “constant economy” is assumed;
- the socio-economic importance given to activities in a given territory does not necessarily reflect the ranking that local players would give;
- the vulnerability considered here does not include environmental issues such as biodiversity;
- the vulnerability indices proposed are general in nature: demographics, sectoral interactions, etc.; numerous factors can alter the matrix locally and collection of local data should, therefore, help to construct a ‘territorialised’ matrix for potential impacts and corresponding vulnerability.