

## 5 Vulnerability

### 5.1 Definition

Vulnerability can be opposed to resilience, which corresponds to the capacity of a local or regional community to resist external shocks and cope with change. Shocks are rather punctual (e.g. financial and economic crises, extreme weather events, geopolitical crises), while changes are of a more structural nature (e.g. climate change, changes in demand for specific goods or services, depletion of raw materials or primary energy sources).

Different types of vulnerability can be associated to each category of geographic specificity:

- **Mountains:** Mountain areas are particularly exposed to climate change, affecting all environmental resources and economic sectors. To build resilience in the face of uncertainty requires multi-level and cross-sectoral coordination and resources. This may be facilitated by the long traditions of mutual collaboration in mountain societies, to address the challenges of seasonal access to resources and to respond to natural disasters. Further challenges relate to tourism. Climate change is likely to have major impacts on snow-based tourism, especially at lower altitudes; and fashions for specific types of activities change. Consequently, investments need to be made in year-round tourism and its integration with other economic sectors.
- **Islands:** From an economic perspective, islands tend to be more exposed to external shocks as a result of the relatively higher trade openness, high degree of export concentration and high dependence on strategic imports, such as food and fuel. From an environmental perspective, islands are considered to be more vulnerable to climate change impacts than the continental mainland. Islands' infrastructure such as airports, sea ports and highways are often located near the coast and hence particularly vulnerable to sea level rise and flooding. Also, from a governance perspective, structures are more likely to face greater challenges in part due to the tightness of island communities, particularly islands with low population, such that the independence of these structures may at times be hindered
- **NSPA:** Harsh climatic conditions can be disruptive which leaves individual communities at risk of being 'cut' from the rest of the area. Importance of car as a means of transportation leaves the most fragile sections of the population (youth, elderly, disabled) at risk.

### 5.2 Illustration

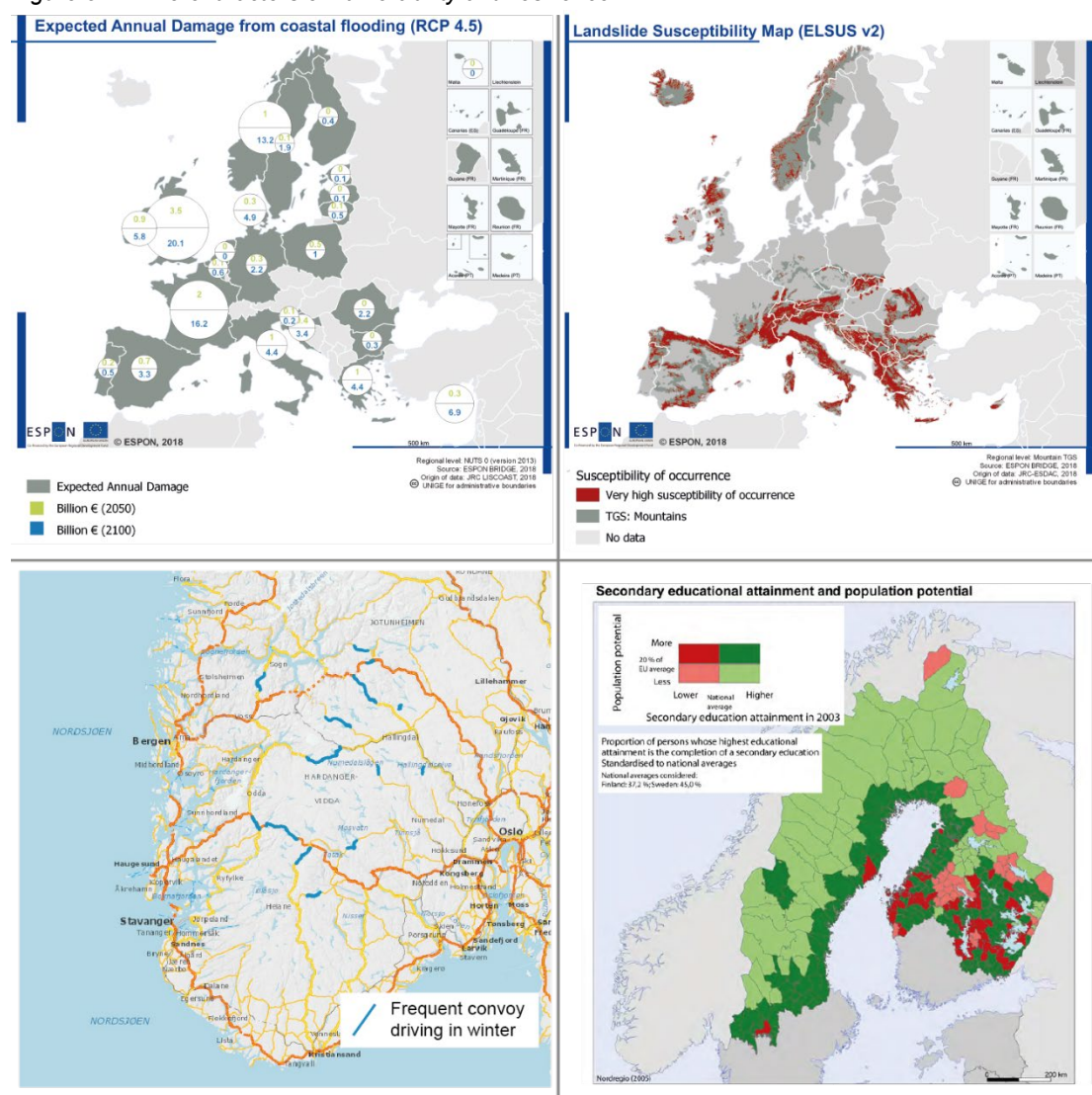
Vulnerability is linked to the probability of occurrence a wide range of potentially damaging phenomena:

- Natural hazards (landslide, flooding, storms...);
- Fluctuations on world markets;
- Financial crises;
- Sanitary crises.

# ESPON BRIDGES

It results from the combination of the capacity of actors to limit or compensate for negative effects of these phenomena and from the potential losses resulting from them. Complex systems such as metropolitan regions or value chains based on the principle of “just in time“ can be more vulnerable than more basic organisations. Vulnerability can be enhanced by diffusing knowledge, encouraging stakeholders to acquire competences and by reinforcing trust. The possible representation factors of vulnerability and resilience can be correspondingly diverse: volumes of potential losses from floods, identification of areas with high landslide risks, identification of transport axes that are frequently closed or restricted to convoy driving in winter, levels of secondary educational attainment as a factor of enhanced capacity to adapt to changing framework conditions (see Figure 5-1).

Figure 5-1: Different factors of vulnerability and resilience



Objective factors of constraints : Vulnerability

### **5.3 Measurement issues**

As described in the previous sections, vulnerability is the combined effect of the probability of damaging phenomena, of the capacity of actors to address or compensate for them and of their potential losses resulting from them. The possibility of measurement varies greatly depending on the types of risks and losses that are considered. Furthermore, probabilities of damaging phenomena are difficult to estimate. Quantitative analyses can therefore inform debates by providing an evidence-base on vulnerability and resilience-related issues that stakeholders and policy-makers have decided to focus on. There are no generic measures of vulnerability. Considering levels of uncertainty, resilience-related policies resilience cannot be evidence-based but only evidence-informed.

### **5.4 Policy issues**

Enhanced resilience should be a core component of smart specialisation. Identifying and describing specific hazards linked to geographic specificities is one component of such an approach. In this respect, two main axes can be distinguished depending on the way on which geographic specificities are understood:

- Geographic specificities as types of interface between human activities and the natural environment: In this perspectives, vulnerabilities linked to natural hazards can be highlighted, e.g. landslides in mountains, floods and storms in islands and coastal areas. Climate change in many cases increases these hazards, or exposes communities to new hazards.
- Geographic specificities as obstacles to interaction and functional integration: From this point of view, the vulnerability is first linked to the small size of labour markets and challenges for the development of value chains and for the production of specialised, high value added products. Social and economic effects of fluctuations on world markets and financial crises may be greater as a result of this. Second, communities may depend on a limited number of transport connections and modes.