

Institutional vulnerability of spatial planning systems against climate change in the BSR

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1. Introduction

Climate change is a global problem. Mitigating global warming has called for intergovernmental approaches, most famously the United Nations Framework Convention on Climate Change (UNFCCC), approved by 190 member states in 1992 and the following Kyoto protocol that took effect in 2005. These treaties bind most of the countries in the world to work together against human-induced climate change.

Recently, the perspective of impacts and adaptation has become more prominent in climate policy. Recent research has shifted the debate from whether climate change is happening towards what should be done about it. The fourth assessment report of the Intergovernmental Panel on Climate Change (IPCC) stresses the magnitude of challenges caused by climate change, both in mitigation and adaptation. Other topical studies include the ACIA study on the effects of climate change in the Arctic (McCarthy, Canziani et al. 2001; Symon, Arris et al. 2005) and the Stern Review on the global economic impacts of climate change (Stern 2006). Also, major weather-related disasters such as hurricane Katrina and the 2003 heat-wave in France have underlined the need to adapt to climate change.

This paper highlights the topic of vulnerability, which is central to understanding adaptation. It discusses aspects of institutional vulnerability to climate change in the Baltic Sea Region (BSR), with a special focus on spatial planning systems. The aim of the paper is above all to get a quick overview on the state of institutional vulnerability and give ideas about aspects of it that might have an impact on the drafting and implementation of adaptation policies. This serves as a contribution to the ASTRA project to introduce best practices and develop policy recommendations in respect to adaptation to climate change.

The paper draws on recent research on the topics of vulnerability, spatial planning and climate change adaptation. It also adds an empirical contribution, namely, a meta-evaluation on the state of adaptation in the Baltic Sea Region, based on evaluations acquired from the UNFCCC focal points through an e-mail questionnaire. The answers were obtained from all states bordering the Baltic Sea, with the exception of Norway and Russia.

The need to adapt to the impacts of climate change is a local issue, stemming from individual local vulnerabilities. Adaptation, however, calls for co-operation of various local actors, some of which perhaps have previously not even engaged in spatial development processes. This underlines the need for top-down guidance in the form of active and cross-sectoral climate change related policy making. The main question we aim to answer in this paper therefore is:

What is the current status of adaptation in climate change –related spatial planning policies of the Baltic Sea region countries and are these policies targeted and empowered so that all relevant levels of governance are actually capable of participating towards adaptation? This question is sought to answer through a meta-evaluation on a questionnaire sent to the respective UNFCCC focal points during the first quarter of 2007.

2. Key terms and methodology of the study

This study constitutes a technical meta-evaluation on the evaluations acquired from the UNFCCC focal points on the adaptive capacities of their countries¹. As a method, a scorecard approach proposed by United Nations Development Program (UNDP) Adaptation Policy Framework (APF) and introduced by the UNDP Global Environment Facility (GEF) is used (see UNDP 2003). The UNDP has developed a set of methods for the policy development, which have mainly been used in developing countries, but can easily be adjusted to the scope of BSR countries, too. The wider target of the evaluation is to assess the institutional vulnerability of the Baltic Sea Region countries towards climate change that is the capacity to implement spatial planning related policies, legislation, strategies, and programmes.

Economic indicators such as the national or regional GDP is often used as a rough vulnerability indicator; low GDP per capita is associated with a low coping capacity. Because of the dual nature of vulnerability (assets at risk and the means to protect them) however, indicators such as GDP do not readily tell about the vulnerability of a country; without policies promoting adequate adaptation measures and funds to finance them, wealth only adds to the vulnerability of a given region as the regional GDP per capita is one factor when damage potentials are counted (other common indicators for damage potential are population density and the fragmentation of natural areas).

It is to be noted, too, that vulnerability of a place has several aspects; other than economical, also social and ecological (Schmidt-Thomé 2006)². Institutional aspect of vulnerability can be defined following the UNDP³ definition component of adaptation as '*the awareness on the effects of climate change, long term institutional preparedness and possibilities for adaptation, in terms of spatial planning practices, co-operation and dissemination structures*'. This definition of vulnerability is also close to the IPCC⁴ definition.

¹ The questionnaire was answered by Pirkko Heikinheimo (Coordinator, Research Programme on Adaptation to Climate Change, Ministry of Agriculture and Forestry) Finland; Ingrida Apene (Deputy Director of the Climate and Renewable Energy Department, Ministry of the Environment), Latvia; Kati Mattern (Federal Environmental Agency of Germany, Climate Change Division on Behalf of the Federal Ministry for the Environment, Germany; Povl Frich (Danish Environmental Protection Agency), Denmark; Anna Forsgren (Division of Environmental Quality, Ministry of the Environment) Sweden; Maria Klokocka (Chief Specialist, Department of Environmental Protection, Ministry of Environment), Poland; Jolanta Merkeliene (Chief desk officer of Air Division, Environmental Quality Department, Ministry of Environment), Lithuania; and Karin Radiko (Ambient Air and Radiation Safety Bureau of the Environmental Management and Technology Department, Ministry of the Environment), Estonia.

² In common hazard literature vulnerability is commonly seen from another angle, as contributing to the risk faced by societies. For example, under the ESPON 1.3.1. Hazards –project the integrated vulnerability of the EU 27+2 was studied. In the project, after studying data availability and problems of measuring some indicators, it was decided to base the study on only four indicators, three of which studied the damage potential and one, national GDP, coping capacity. Here, apart from the ecological dimension, damage potential stood for the economic dimension of vulnerability, and coping capacity for the social dimension (Schmidt-Thomé 2005, 83). The result was a map of the integrated coping capacity of the EU 27+2.

(Schmidt-Thomé, P. (editor) 2005. The Spatial Effects and Management of Natural and Technological Hazards in Europe – final report of the European Spatial Planning and Observation Network (ESPON) project 1.3.1. Geological Survey of Finland. Espoo, 197p.)

³ According to UNDP, Vulnerability = Risk – Adaptation (Lim & Spanger-Siegfried 2005, 71)

⁴ In the IPCC definition of vulnerability, institutional vulnerability is part of the social component of vulnerability. As IPCC defines it, vulnerability is 'The degree to which a system is susceptible to, or unable to cope with, adverse effects of climate change, including climate variability and extremes. Vulnerability is a function of the character, magnitude, and rate of climate variation to which a system is exposed, its sensitivity, and its adaptive capacity.' (McCarthy, J. J., O. F. Canziani, et al., Eds. (2001). *Climate Change 2001: Impacts, Adaptation, and Vulnerability*. New York, USA, Cambridge University Press.

The starting point for any policy development is to define a reference level from which the policies aim to develop. This vulnerability baseline (as according to UNDP's Adaptation Policy Framework) means the exposure and sensitivity of the regions to adverse consequences of climate change, in respect to the adaptation policies currently available (Lim and Spanger-Siegfried 2005; 71). Under the terms of the APF, vulnerability is the residue of the impact of climate change on and the socio-economic conditions in the area, and the institutional means to overcome it, the main focus of this paper.

Precisely, this paper studies the vulnerability of the national spatial development –related systems to the near future threats caused by climate change and foreseeable trends in socio-economic development. These become risks unless the system is able to adjust to the changing conditions and engage on adaptive actions. Future vulnerability is therefore an estimate based on the current vulnerability of the region and foreseen development (Lim and Spanger-Siegfried 2005).

The troubles associated with hard indicators like GDP and the troubles in approaching adaptation as a concept made us look into the question through qualitative methods introduced by the UNDP. The UNDP/GEF Capacity Development (CD) approach is a conceptual framework for capacity assessment and development, developed to serve GEF's 22 strategic priorities. These priorities constitute GEF's work to fund environment protection projects in developing countries. Climate change is one of these priorities. In this study, the approach was used to determine a vulnerability baseline for the BSR.⁵ For these needs, the scorecard was modified by the Centre for Urban and Regional studies (YTK) of the Helsinki University of Technology and sent to the UNFCCC focal points (or persons they forwarded the request to). The scorecard is included in Appendix I.

Vulnerabilities of the national spatial planning systems as seen by the focal points were look at from five aspects that were (*for more information, please see Chapter 4.1.*)

- National capacity to *conceptualize and formulate policies*, legislation, strategies and programmes
- Capacity of local actors to *implement policies*, legislation, strategies, and programmes
- Capacity to engage and *build consensus* among all stakeholders, including individuals
- Capacity to *mobilize information* and knowledge and
- Capacity to monitor, evaluate, report, and *learn*.

These aspects of vulnerability were studied on three levels, *systemic, organizational and individual* (*adopted from UNDP 2003*):

- on a *systemic* level; the different aspects of creating 'enabling environments', i.e. the attitudes towards climate change adaptation and the policy-, regulatory and accountability frameworks,
- on an *organizational* level; the overall performance and functionality capabilities of actors on different levels and different aspects of regulations and guidelines and
- on an *individual* level; developing of skills and imparting knowledge and aspects of participation and awareness rising on adaptation needs and practices.

In our questionnaire, views on each of these levels were obtained by presenting three statements on the adaptation capacity, out of which the respondent was to choose the one best describing the national situation. The statements were built so that the adaptation capacity progressed from a very basic level to a highly sophisticated and active one. The answers were then ranked from one to three points, in order to dig out differences in institutional vulnerability between the BSR countries. Also included in the questionnaire was an open question, in which views on possible problems of adaptations and adaptation related conflicts were asked. In this study, the respondents are only referred to by name when referring to information obtained from the answers to the open question.

⁵ The technical evaluation does not address the societal vindication and ideological choice affecting behind the adaptation policies chosen or possible maladaptation (*for additional information, see Appendix II*). Societal vindication and situational validation is here seen as a task for a local weighting process as local adaptation plans are drafted.

3. Patterns of vulnerability in the BSR

Risk faced by a society is always a sum of the hazard itself and the vulnerability of the society at hand (Schmidt-Thomé 2006). According to Schmidt-Thomé (2006), human actions affect the risk in two ways; sometimes by changing the properties of the physical environment but more often by increasing the vulnerability of regions, by putting more assets (be it monetary or human) at risk. Flows of these assets can even change the public opinion on what is considered a risk, through the re-evaluation of the societal vindication of policies. Table 1 lists some underlying risk factors for some climate change related risks relevant to the BSR⁶.

Natural hazard	Climatic factor	Other factors ^{*7}
Storm surges (coastal flooding)	Low pressure Windstorm Sea-level rise	Geographical distribution Societal sensitivity
Flooding (inundation)	Excessive rainfall for an extended period, often in combination with snowmelt	Geographical distribution Land-use Societal sensitivity
Flash floods	Heavy rainfall Convective precipitation	Geographical distribution Land-use Societal sensitivity
Drought Water scarcity	Precipitation Temperature/evaporation	Geographical distribution Societal sensitivity Land use
Excessively hot day Heat wave	Temperature	Societal sensitivity
Excessively cold day Cold wave	Temperature	Societal sensitivity

Table 1: Natural hazards, underlying climatic factors and other risk related factors (from Schmidt-Thomé 2006; 111)

In the next chapters we will provide a short overview on some of the factors affecting geographical distribution and the societal sensitivity of the BSR countries. Such considerations are relevant because vulnerability to adverse climatic events is largely about context. Therefore, it is important to consider the present state of the systems at risk.

⁶ For information on climate change impacts in the region please see Kropp, J. and K. Eisenack (2007). Regional Assessment of Sea-Level Rise in the Baltic Sea Region: Costs of Adaptation vs. Non-Adaptation (unpublished draft, to be available at www.astra-project.org).

⁷ The terms are employed here in a tentative instrumental sense as follows (According to Schmidt-Thomé, P., Ed. (2006). Natural and Technological Hazards and Risks Affecting the Spatial Development of European Regions. Geological Survey of Finland, Special Paper 42. Espoo, Geological survey of Finland.

“Societal sensitivity” is the sensitivity of the society, at any specific place, without fundamentally changing the land use or human activities at that place (but including general societal development, for example leading to a society successively more sensitive to e.g. disruptions of power supply or transportation). Thus, it is related to the coping capacity of the society.

“Geographical distribution” denotes development of new activities at a place (e.g. constructions accepted at a floodplain, along a low lying coast or in a steep slope), i.e. closely related to the exposure.

“Land use” is the changes to land use practices without fundamentally changing the land use (e.g. using more water demanding crop varieties in agriculture, or introducing large clear cut forestry), thus being closely related to the coping

3.1. Current development patterns in the BSR

Different trends in socio-economic development either increase or diminish local vulnerabilities⁸. Although decisions towards common climate policies are taken on the international level, the scope of the problem is such that action has to be taken on all levels. The problem calls for a new kind of territorial governance that seeks to bring together actors not only on economic grounds but also to aid political, social, intellectual, material and territorial development. It also calls for partnership building and collective action between public and private actors in local coalitions (Dasí 2006).

Studying the issue of climate change adaptation from the Pan-Baltic point of view, the Baltic Sea Region's character as a meso-region is worth noticing. The region does not function as a single economic area, neither is it a single urban system, but rather a collection of national systems that have some 'transnationally interlinked relationships' (Hanell and Neubauer 2005). Hanell and Neubauer (2005) also point out that a modest share of the countries' economy is oriented towards the Baltic Sea region, especially in the southern countries. Although some common initiatives exist, the region generally does not work together on issues comparable to climate change. This promotes the scope taken in this study, to look at the adaptation policies individually on a national level.

This is not to say that some form of co-operation could not be found. The Helsinki Commission (HELCOM) is the governing body for contracting parties that have agreed to work towards protecting the marine environment of the Baltic Sea. The parties include all coastal nations and the EU. The Union of Baltic Cities promotes co-operation and exchange of experiences between Baltic cities under several thematic commissions, including environmental and sustainability issues. Still it seems that the national strategies stem from global agreements or from the initiatives proposed by the EU, rather than agreements between the BSR countries themselves. To successfully address the issue would call for territorial governance however. This means shared spatial visions on the need for climate change adaptation and an organisational consensus on the roles of different actors (Dasí 2006).

What are the issues that spatial planning systems have to tackle? The new EU member states in particular have gone through some substantial changes in the past decades and the change is ongoing still. In respect to climate change, not all development trends can be seen positive, and it is certain that in order to respond to the challenges caused by the changing climatic conditions, development in the region should be guided in a sustainable manner.

Demographic patterns in the BSR countries all seem to show the trend of urbanisation, albeit at different stages of development. Poland and Lithuania are still quite decentralized, whereas the population of Finland, Estonia and especially Latvia is heavily concentrated in the capital regions (Hanell and Neubauer 2005). Hanell and Neubauer (2005) note that the cities in the eastern part of the region historically are more densely settled than those of the west, so that the share of the urban pattern is smaller. The development path where people migrate to capital cities, discussed for years if not decades in Finland for example, is picking up in the Baltic countries as well. At the same time urban sprawl is hastening the expansion of settlements (Hanell and Neubauer 2005).

In terms of aggregation of risk, especially in the coastal areas, the situation in the BSR can in the European context be seen as quite good. Although the number of cities in the BSR is large compared to the EU total, most of them are small and more of a sign of a spatially even development. Poland is a prime example in this respect. The population densities of the cities are also considerably lower than in the EU as a whole (Hanell and Neubauer 2005). Population pressure towards coastal municipalities is also smaller than in the EU in total, although maps of municipal population densities do not tell

⁸ Readers are highly encouraged to study the vulnerability of their own area or sector by reflecting the findings of this paper against locally relevant development and foreseen impacts of climate change. To guide in this task, tools and information packages developed lately can be of help. For ideas on how to approach the vulnerability issue we recommend seeing to the Adaptation Wizard developed by the UK Climate Impact Program (*to be found at* <http://www.ukcip.org.uk/resources/tools/adapt.asp> or, for the Finnish readers, a climate change web-site aimed for planner's needs at www.ilmastosuunnittelu.info (in Finnish).

about the possible pressures on the immediate coastline (<1 km from the sea) (Hanell and Neubauer 2005; 10; EEA 2006). European Environmental Agency indeed sees an important growth trend on the coastal zone during the last decade (EEA 2006). The growth trend interestingly does not show in the EEA (2006; 16) report in terms of increase of the built-up area on coastal areas, where marginal increase from 1990 to 2001 is only visible on the coastal strip (0-1 km) in Estonia and Germany.

In all, the population is actually decreasing in the whole Baltic Sea region (Hanell and Neubauer 2005). Coastal cities show both negative and positive development, with general decrease in the Baltic States and on the south-western coast of Sweden. Looking at the situation on a local level, population pressure on the coasts does not look alarming (Hanell and Neubauer 2005; 10). However, this level of study may hide significant development on the immediate coastline, like on the coasts of national interest of Sweden (which cover the whole of the southern coastline of the country from Stockholm region southwards) where new developments have since the early 1990s focused on the immediate coastline (SCB 2005). The rate of coastal development has in places been way over 10 times as high as in the inland regions, and resulted in building densities many times higher (SCB 2005). This trend can be generalized to cover all European coastal zones (EEA 2006). The pressure on immediate coastline compared to the 10 km coastal zone is evident in the BSR, with clearest distinction in Latvia, Lithuania and Poland. Only in Finland was the immediate coastline more sparsely built in 2001 than the whole coastal zone (EEA 2006).

The Polish coast, southern coast of Finland and all of Denmark together with the metropolitan regions of Stockholm and Helsinki are growing fast, and it is in these urban hotspots where largest population increases can be observed (EEA 2006). In all however, as Hanell and Neubauer (2005) note, metropolitan areas, too, have actually often seen 'least unfavourable development', instead of a particularly positive one. It must be noted though that for the Baltic states especially, the decline of population during the last two decades is largely explained through the collapse of the Soviet Union and the subsequent repatriation of military and foreign citizens in the early 1990's. This cut up to a tenth of the countries' population, urban and rural alike (Hanell, Neubauer et al. n.a.).

In the eastern part of the region population is more concentrated in large coastal metropolises. Looking at the situation on the national level, as Hanell and Neubauer (2005) note, single metropolitan cities still dominate. As worst examples Latvia and Estonia are mentioned. In Finland, too, the population of the capital region is rising fast. The coastal location of Helsinki, Tallinn and Riga adds to their vulnerability in terms of climatic impacts. In some medium sized coastal cities local geographical conditions add to their vulnerability, like the river sea-interaction zone of Daugava river and Gulf of Riga, Vistula river flowing to the Gdansk Bay in Gdansk and the city of Pärnu being located in the end of a south-west – north-east –oriented Pärnu bay that is threatened by the parallel general direction of storm winds.

Concentration of population and the pressure on spatial development that follows are major contributors in increasing vulnerability of these areas (see Peltonen, Haanpää et al. 2005). Pressures on land development have been seen to force developing land less suitable for construction, in terms of soil types, relative height level compared to the average sea-levels or even soil contamination. During the ASTRA –project, this has raised discussion in the greater Helsinki region. A similar positive net migration pattern (between 1995-2001) can be seen in the rural areas around Tallinn, Estonia, Gdansk, Poland, and in the bigger cities of the German Baltic Sea coast, which might indicate similar pressures (Hanell and Neubauer 2005).

Like in areas with population pressures, problems concentrate in sparsely populated areas, as the municipalities are struggling to keep their economics balanced. In Finland this is seen leading to Figurehting over new inhabitants by offering land for development that fulfils scenic values rather than the requirements for building safety. Diminishing tax base brings its own troubles too, for example as the price for keeping up the municipal infrastructure rises per inhabitant (Peltonen, Haanpää et al. 2006).

For employment, the restructuring of jobs follows the demographic patterns where the largest (metropolitan) cities are greatest gainers (Hanell and Neubauer 2005). As the appreciation of tourism as one of the key climate change exposure units in the BSR⁹ might hint, service sector is the one gaining in employees as jobs in manufacturing and primary production are being replaced by mainly private sector service posts in metropolitan regions (Hanell and Neubauer 2005).

Agriculture still is being seen as an important sector for climate change adaptation though. In many regions, if not so much on coastal regions, agriculture still is the dominant branch of employment, especially in Poland, Lithuania and to some extent in Estonia. It should be noted though that in absolute terms the largest share of employment still works in the service sector (Hanell and Neubauer 2005).

It seems that the development described above is to stay, as the trend of cities being forced to compete with each other within countries is seen only to intensify in the Baltic Sea Region. Networking between cities is seen as a must in order for them to maintain (international) competitiveness, but global markets seem only to call the metropolitan regions. These regions both have a major share of the urban population and typically boast GDP per capita way above the national average, with Latvia (Riga) and Estonia (Tallinn) being extreme examples. Also in countries like Finland a good third of the urban population inhabits the metropolitan region.

Urban sprawl is a phenomenon common for the whole region. In terms of migration surplus it is in fact the small cities close to the metropolitan region where the in-migration is in fact peaking (Hanell and Neubauer 2005). In total, urban sprawl has counted for an average of 45% increase in artificial surfaces on the 10 km coastal zone of Europe (EEA 2006). Out of the BSR countries this number peaks in Estonia (over 70 %) and Poland (over 60%), with Germany and Lithuania following close by (EEA 2006).

Thinking of the GDP as a marker for coping capacity, as was seen under the ESPON Hazards – project (Schmidt-Thomé 2006), it is also of importance where the GDP is produced and how the wealth is distributed. Looking at the coastal regions of the BSR, a clear north-west – south-east divide can be seen. Coastal areas of Finland, Sweden, Germany and Denmark are all close or slightly above the EU25 average, with coastal metropolitan regions way above that. GDP per capita of the southern coastal regions on the other hand falls below half of the EU25 average, with Riga and Tallinn doing slightly better (Hanell and Neubauer 2005).

Hanell and Neubauer (2005) state that the BSR holds the sharpest economic divide within a region on national level, and it thus repeats itself when looking at the regional level where both extremely rich and extremely poor regions can be found. The economies of the transition countries are picking up fast, but the interregional disparities are increasing (Hanell and Neubauer 2005). This must affect the coping capacity of coastal regions outside metropolitan regions. However, it can be noted with some relief that the fact that large GDP's per capita concentrate on regions with the largest populations clearly enhances the coping capacity of these central regions - central not only in terms of economy but in terms of vulnerability, too.

⁹ Eisenack, K. and J. Kropp (2006). *Screening study on the perception of climate change impacts of ASTRA partners in the BSR (Intern project document)*.

3.2. Overview on national planning systems in the Baltic Sea Region

Spatial planning, when effective, is a central way of guiding the location of monetary and human assets. It is difficult to establish BSR-wide spatial planning solutions. Indeed, still today Pan-Baltic planning or regional development solutions are rare (Böhme et al. 2000). The VASAB 2010 –process is one of the few initiatives in this field. It underlines the role of local and regional planners in putting into action the commonly agreed principles (Böhme et al. 2000). As Böhme et al. (2000) note, this view follows the widely accepted subsidiary principle of the European Union, where decisions are preferably taken on the lowest level possible. Thus the national spatial development guidelines in effect in many countries would be supplemented with commonly agreed development principles that then together would guide the actual planning practices on the local level.

In principle, the planning systems in BSR countries are quite homogenous. In Denmark, Sweden, Finland, Estonia and Lithuania national plans are followed by district (county) level regional plans and municipal local plans. In Latvia the county itself does not practice physical land use planning. In Poland, too, the responsibility on physical and strategic planning lies in the hands of the regional marshals' offices. This is because the local level, although with substantial planning responsibilities, still has weak enforcement potential. This leads to the current lack of local plans. Regional level is also the level that has an effect on the national development policy. Counties, administratively between the regional and municipal offices, have no planning duties whatsoever. In Germany, a federal republic, the regional level planning is often dominated by the federal states, although municipalities still are the drivers of regional planning processes.

Like in Germany, the municipalities often have considerable power over the planning of their region in the BSR countries. This is especially true for Denmark, Lithuania, Estonia and Finland. In Estonia this goes to the extent that the planning system is stated as the most decentralized of the Baltic States. It is dubbed being the most sophisticated, too, being regionally balanced and aiming at equal development of the areas. To even it out though, the municipal level is at present lacking funds (Nordregio 2000; 17, 20). This also applies to Latvia, Lithuania and Poland, where the local level in principle has substantial planning responsibilities, but either little experience in plans or a weak enforcement potential towards them.

Usually, in the countries where the municipal level has a great freedom over actual land use, the role of the regional level is to compile strategic land-use plans, or merely to set medium-term development goals, like in Denmark. The guidance given in regional plans and even in the national level land use principles (like the national land use objectives in Finland or the federal regional planning acts in Germany) has to be taken into account, and in Denmark these upper levels still have a right to veto local plans (Fischer 2000). In Latvia the municipalities mainly participate in planning through the mayors' participation in district councils that factually override the municipal level in territorial planning and development policies. This two-tier system differs from the one used in the other Baltic states but is similar to the Polish system (Cace and Mihailova 2000).

4. Institutional vulnerability in the BSR countries

More interesting than the construction of the planning systems themselves is to understand how these systems actually function from the viewpoint of capacities related to climate change adaptation through horizontal and vertical governance¹⁰, and how new ideas such as climate change adaptation are disseminated and mobilized within the system. The radar diagrams featured in this chapter more than anything tell about how taking up the different aspects of adaptation on radiates down on different levels and contributes to the aspects of institutional vulnerability of the individual BSR countries.

As described in chapter 2, the following analysis is based on the answers of the national UNFCCC focal points or corresponding persons, obtained through an e-mail questionnaire during the first quarter of 2007. It is to be noticed once more that the aim of this study was to get a first impression on the capacity of each BSR country to adapt to climate change. Therefore, the national evaluations presented here are based on opinions of single persons (with possible advisors) representing their countries only. The list of contributors to our study can be found in the footnote on page 4.

4.1. Institutional vulnerability: attitudes, capabilities and frameworks – an overview

Issues related to sub-optimal adaptive capacities that contribute towards institutional vulnerability cover themes many more than just insufficient policy and legal guidance. To have a deeper insight on the issue, the answers obtained through the questionnaire were according to the UNDP/GEF CD approach studied from five aspects¹¹ on three different levels (separately from the systemic,

¹⁰ Vertical and horizontal governance respectively refer to the multi-level forms and to the interplay between territories, actors and policies that define territorial governance. Dasi, J. F. (2006). ESPON project 2.3.2. Governance of Territorial and Urban Policies from EU to Local Level. ESPON, Luxembourg.

¹¹ ¹¹ The aspects of adaptive capacity are formulate as follows (*modified from UNDP/GEF 2003*):

1. Capacity to conceptualize and formulate policies, legislations, strategies, and programmes.

This category includes analyzing conditions that may affect country needs and performance in climate change related (adaptation) policies, developing a vision, long-term strategizing, and setting of objectives. It also includes conceptualizing broader sectoral and cross-sectoral policy, legislative and regulatory frameworks. It further contains prioritization, planning and formulation of climate change adaptation related guidance in planning.

2. Capacity to implement policies, legislations, strategies, and programmes.

This category includes process management capacities that are essential in the implementation of any type of policy, legislation, strategy and programme. It also includes execution aspects of programme and policy implementation. It includes mobilizing and managing human, material and financial resources, focusing on the capabilities of local actors in spatial planning.

3. Capacity to engage and build consensus among all stakeholders.

This category includes issues such as mobilization and motivation of stakeholders, awareness-raising and developing an enabling environment for spatial planning processes and the civil society to address climate change and discussion on the issue.

4. Capacity to mobilize information and knowledge.

This category pertains to the mobilization, access and use of information and knowledge. It includes issues such as effectively gathering, analyzing and synthesizing information, identifying problems and potential solutions. It further covers co-operation issues between different actors, including planners, politicians and scientists.

5. Capacity to monitor, evaluate, report and learn.

This category pertains to the monitoring of progress, measuring of results and learning and feedback. It naturally links back to policy dialogue, planning and improved management of implementation on international and national levels.

organizational and individual point of view). These aspects are visualised in the diagrams below (Figures 1-3)¹².

In all, the BSR countries score best on the *systemic level* and poorest on the individual level, with the organizational level showing the most dispersed results. This seems to show that knowledge of the problem and need for adaptation exists, especially on the national level (Figure 1; capacity to monitor...; capacity to engage...). This knowledge however does not always radiate down to the local (operational) level, where the answers are dispersed between 1 and 2 points (Figure 1; capacity of local...). As climate change adaptation is only beginning to become a true policy issue (as greenhouse gas mitigation already is), none of the countries obtains full score on the national capacity to conceptualize and formulate policies (Figure 1).

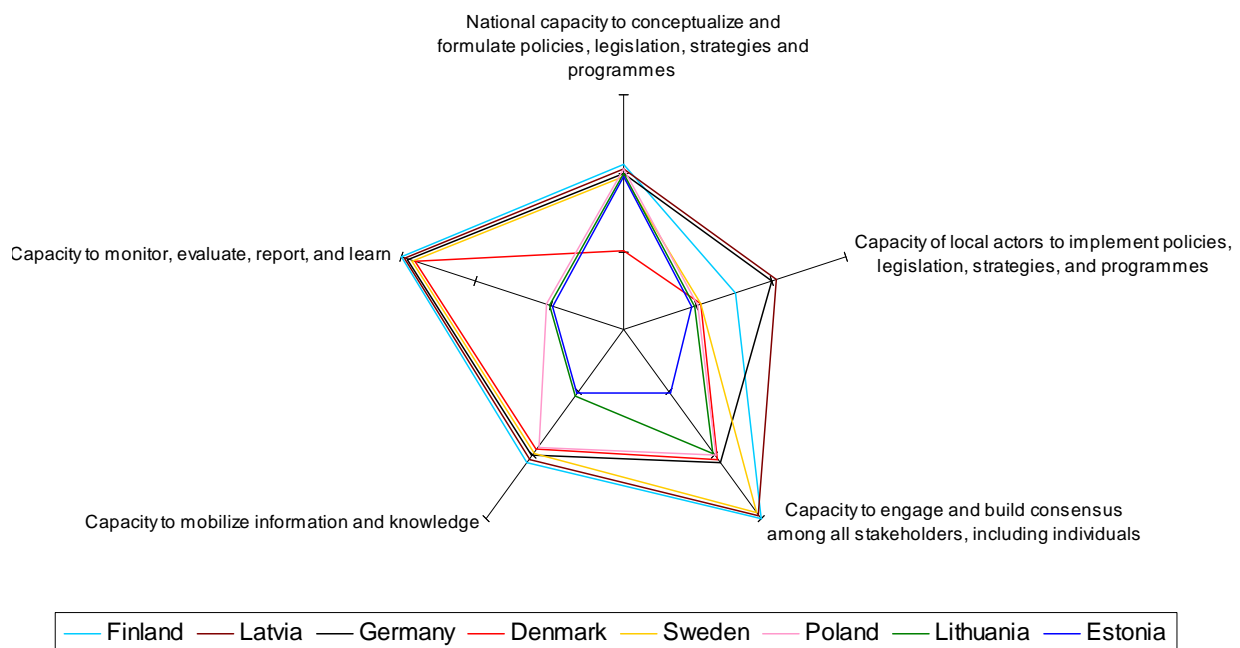


Figure 1. Institutional vulnerability of the national spatial planning systems in the BSR countries on the *systemic* level. Based on the views of national UNFCCC focal points or corresponding persons obtained through e-mail questionnaire (n=8).

When looking at the actual policies on an *organizational level*, we found the above mentioned to lead into a situation where adaptation does not seem to be well prioritized and where the national level policies are almost universally lacking, except for some sectoral studies (Figure 2; national capacity...). If adaptation strategies exist, they do not yet have a clear impact on actual planning guidelines such as land use acts. This lack of upper-level guidance shows as a low capacity of local actors to engage in adaptation related activities (Figure 2; capacity of local actors...). There are also marked differences between the countries in guiding action on different levels of spatial planning and to promote co-operation between different actors (Figure 2; capacity to mobilize...).

¹² In the diagrams the statements chosen by the focal points are valued from one to three points, the adaptation capacity of the countries progressing from a very basic level to a highly sophisticated and active one. (For visualisation purposes the scoring is spread a little around the scores obtained (1, 2 or 3, except for Finland, where scores of 2,5 and 1,5 were given once on systemic and individual levels, respectively). The order of countries around certain node therefore does not carry any connotations. The center of the diagram is marking zero.) The better the score, the less vulnerable the country is seen in the various respects. Please bear in mind that the answers for each country are based on the views of national UNFCCC focal points only. Please also note that the diagrams are much clearer to read when printed.

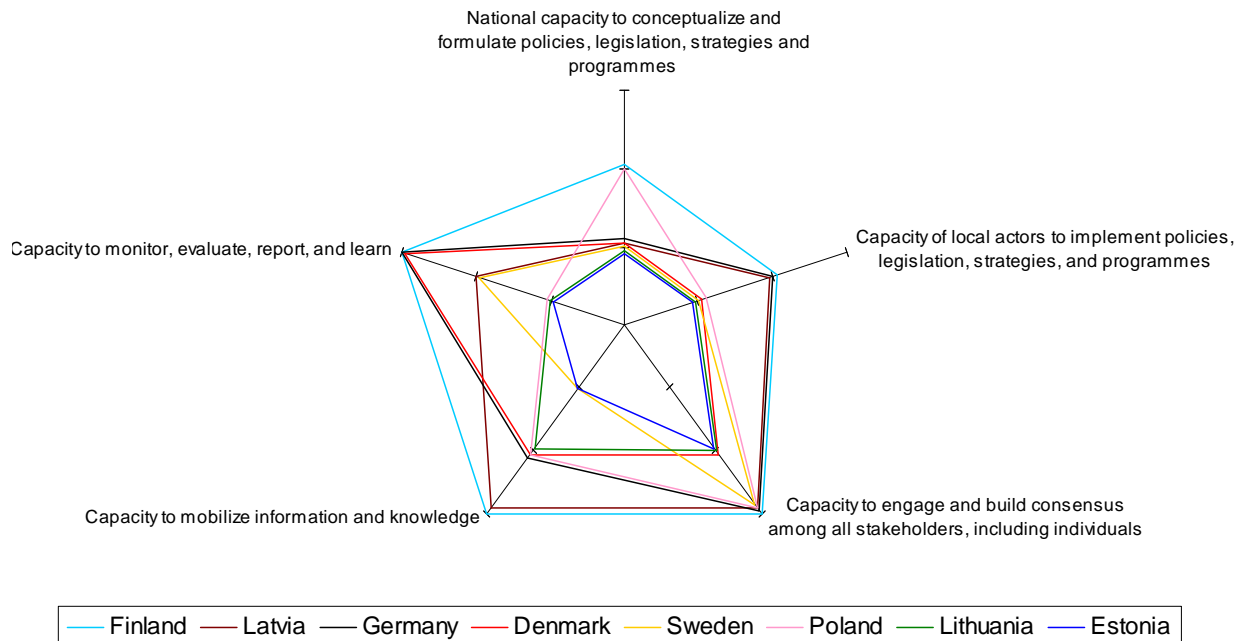


Figure 2. Institutional vulnerability of the national spatial planning systems in the BSR countries on the *organizational* level. Based on the views of national UNFCCC focal points or corresponding persons obtained through e-mail questionnaire (n=8).

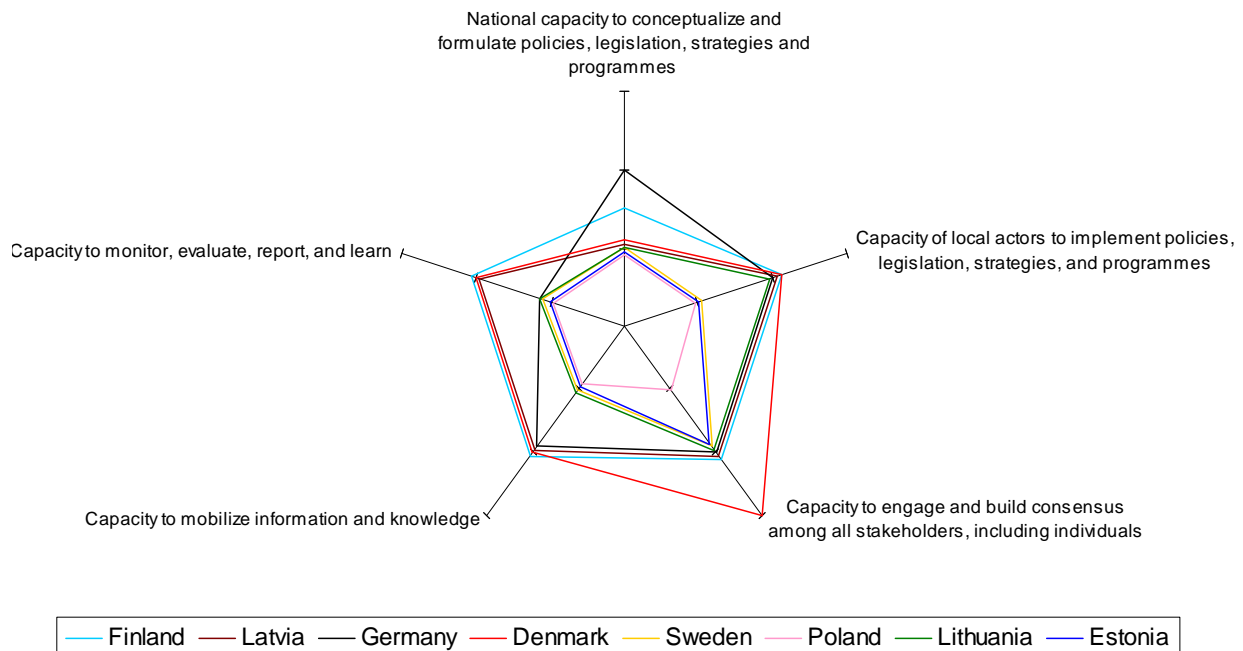


Figure 3. Institutional vulnerability of the national spatial planning systems in the BSR countries on the *individual* level. Based on the views of national UNFCCC focal points or corresponding persons obtained through e-mail questionnaire (n=8).

The individual level tells about the ability and activity of spatial planning actors in taking action based on national policy guidelines and willingness for co-operation and discussing on the possible and realized adaptive means. The view obtained (in Figure 3) is quite harmonious on a good, if not excellent, level. Although the local actors generally are well informed about climate change issues, the need for adaptation is quite often discussed more than actually worked towards. The less well performance of Estonia, Lithuania and Poland stands out here more clearly than in connection with the other levels.

The results obtained show that there are clear differences on adaptation capacities between the BSR countries. They also tell about marked differences in how different aspects of territorial governance related to climate change adaptation are taken care of. Whereas all the countries included seem to be doing well on consensus development on the threat itself, differences arise in how climate change information is disseminated and how different actors deal with this information.

While it can be seen that common knowledge on climate change is increasing, in many cases it is still uncertain how this information should be dealt with. This seems to be verified by even Sweden scoring low on the capacity to mobilize information and knowledge. Worse still is the situation in turning common knowledge into concrete policies. Although Denmark scores particularly low in this aspect, no country can be said to be doing particularly well. In this respect, in the light of this study, Latvia seems to be a positive exception from the other new EU member states, whose less well performance on almost every aspect of adaptation is highlighted here against the decent scoring of other countries. This is likely largely explained by the weakness of the local level to implement the plans made. In Denmark the situation seems to be partly the opposite, as the readiness of local level to take action is doubled with the lack of action on the national level.

Shortcomings at the national level to conceptualise policies and legislation is a marked, but not a sole reason for some countries scoring low on the capacity of local actors to implement them. National spatial planning structures and allocation of resources between different levels of planning play a large role, not to mention the distribution of political powers. The existence of district councils in Latvia could to be the only structural reason why the country does so well in the evaluation. A powerful regional administration may override the lack of funds to take full use of the planning monopoly on the local level that seems to hinder the possibilities of local actors to take adaptive actions in Estonia, Lithuania and Poland. The study indicates that in the case of Estonia the strong municipal monopoly and connected lack of national level guidance is especially harmful.

Still it should be noted that even a straightforward planning system in operation on all three levels does not guarantee a successful dissemination and mobilization of adaptation actions. Out of the countries where regional plans are compiled, only Finland seems to evoke action on the local level.

To sum up, we see that the attitudes towards climate change adaptation are turning positive in the BSR, but operationalization of emerging adaptation strategies is still emerging. The possibilities of lower level actors to engage in adaptation are very varied, depending on the countries and the aspects from which the issue is looked at. Climate change clearly is a much discussed issue, but the need and means of adaptation still need to be made clearer especially to local actors, in order to engage them into action. The situation can be summarised on a country level as follows in table 2 on the next page¹³:

¹³ The table looks at these functions on 3 levels:

- on a *systemic* level; the different aspects of creating 'enabling environments', i.e. the attitudes towards climate change adaptation and the policy-, regulatory and accountability frameworks,
- on an *organizational* level; the overall performance and functionality capabilities of actors on different levels and different aspects of regulations and guidelines and
- on an *individual* level; developing of skills and imparting knowledge and aspects of participation and awareness rising on adaptation needs and practices. (Adopted from UNDP/GEF 2003)

Table 2. State of climate change adaptation in the institutional perspective in the BSR countries, based on the views of relevant UNFCCC focal points

Country	Systemic	Organizational	Individual
Finland	Climate change issues, both mitigation and adaptation, are high on the national agenda and widely discussed. They have an impact on spatial planning policies, but this has not yet led to action towards adaptation strategies on local level.	As one of the first countries to have a national adaptation strategy, the issue is well disseminated to all relevant actors on all levels in Finland. Strategies of implementation and engaging actual guidelines to planning practices are still missing however.	Common knowledge on the need of adaptation is still a bit poor, but local actors are well informed. They have some difficulties turning adaptation guidelines into action however, despite ongoing discussion on best practices.
Latvia	Both adaptation and mitigation needs are taken up in discussions covering all sectors of the society. Local actors in spatial planning are informed, too, and promote local adaptive means.	Discussion has not yet led to action in adaptation, although adaptation policies are planned. Participatory planning practices are effective and local actors are actively engaged in discussions.	Discussions go on, but action and partly knowledge on actual climate strategies is lacking. Knowledge does not turn into concrete planning practices, although these too are discussed between actors.
Germany	Both mitigation and adaptation policies exist; the issues are well respected and have an impact on relevant policies. Adaptation still lacks the legal status mitigation already has in the federal building law. Although local adaptive means are promoted, inter-sectoral co-operation could be stronger.	Although mitigation still dominates, adaptation issues are on the rise on national level and already disseminated between all stakeholders. A national adaptation strategy is only being drafted. Adaptation strategies exist already on some sectors, but they are not yet engaged in otherwise functioning and participatory planning practices.	On individual level, the situation seems less bright. Although local actors are aware of climate change issues, this knowledge can not be turned to action and there is no discussion on local adaptation measures taken. Among individuals, the concept of adaptation is poorly understood.
Denmark	Both mitigation and adaptation issues are addressed in an environment that respects climate change issues. Sectoral co-operation is weak however, as is the guiding role of climate change policies in the nation's future development – the same can be said of the possibilities of local actors to put these policies into action.	National climate change policies focus on mitigation, although adaptation policies are being developed. Existing policies on some sectors do not yet have guiding functions in spatial planning. Although participatory planning is practiced, stakeholder input on decisions is seen limited – this is reflected by the discussions on climate change focusing between politicians and scientists.	Although some national level guidance exists, it is either poorly known by local actors or seen hard to be turned into action. Although local adaptation practices are developed between other relevant actors, actual discussion on putting them into action is missing. Against this it seems that individuals in general are surprisingly well aware of the effects of climate change and ready to lower their vulnerability.
Sweden	Climate change issues are taken up well on national level, mainly in respect to mitigation, but this fails to create an enabling environment for the local actors to work in.	National climate change policies exist and are regularly updated. They focus on mitigation however, as adaptation strategies are only planned. Functional local planning system benefits little, as effective means of dissemination are lacking.	There is both a lack of information and just as importantly lack of discussion on local level about the need for adaptation. Individuals are equally unaware about climate change issues and cannot demand adaptive action.
Poland	National climate change strategies exist and they have an impact on energy- and spatial planning policies. Their scope is still very limited towards the minimum requirements of the Kyoto Protocol, and few local strategies of implementation have been created.	Main focus still seems to be on mitigation, although adaptation seems to be rising as an issue. Lack of implementation strategies and slender dissemination of climate change issues to the spatial planning actors slows down taking adaptation issues up on the local level.	Local actors in spatial planning have weak knowledge on climate change issues and do not readily engage in discussions about adaptive means. Local adaptation measures put forward go undiscussed, too. The lack of knowledge also applies to individuals.
Lithuania	Climate change strategies answer to the minimum obligations of the Kyoto protocol only. This offers little for the local actors.	Mitigation strategies are updated regularly, and some adaptation strategies exist on few sectors. Information is forwarded to local actors in some degree, but their power of implementation is weak.	The little information given to local actors does not lead to action, mainly since no discussion exists on this level on how to implement the propositions of national strategies.
Estonia	Climate change issues are dealt in the minimum scope of the Kyoto protocol only, thus focusing on fulfilling the mitigation obligations. In this respect the national climate change policies have an input on the spatial development policies, too, but local strategies and means of implementing them are missing.	Discussions on climate change concentrate on mitigation and are mainly kept between the scientific community and politicians. Local actors on spatial planning and individuals have little power over decisions on spatial development. The few sectoral adaptation strategies existing have no effect on land use regulations.	Local actors in spatial planning are ill informed about the impacts of climate change. Some adaptive actions have taken place, but there are no local level discussions on them. Public is poorly informed, too, and incapable of reducing their vulnerability.

4.2. National vulnerabilities in the BSR countries

This chapter looks at the issues introduced in the previous chapters in more detail from the national point of view. It also combines the evaluation on the aspects of adaptive capacities to the national spatial planning structures and to some extent to the current socio-economic trends contributing to national vulnerabilities.

4.2.1. Finland

Recent public discussion on climate change in general and adaptation in particular has generated a widespread awareness of the problem in Finland. Information on the issue is actively disseminated by the state agencies to various stakeholders. Finland was one of the first countries in Europe to introduce a national adaptation strategy, completed in 2005. The strategy covers multiple sectors of the society, and it is therefore fair to say that adaptation strategies do indeed exist in Finland. In addition to this, the national land use planning guidelines of Finland are under revision to include climate change mitigation and adaptation. This work is to be finished in 2008 (Heikinheimo 2007).

According to Heikinheimo (2007), there is a functioning culture of discussion between the ministries, regional environmental centres and the municipalities. The process of compiling the adaptation strategy was open, and thus it was easily approved by different actors (Heikinheimo 2007). Despite almost optimal circumstances in terms of knowledge distribution, upper level guidance and functioning planning system with strong local planning autonomy and tax-based funding, most of the municipalities in Finland have not yet been able to turn the adaptation discussion into action however.

The next step will be coming up with strategies of implementation and to revise building codes and other planning guidelines in order to give a legal impetus for taking the need for adaptation seriously on the local level, which is at the moment slightly lagging behind from other levels. In the southern coastal areas around Helsinki where new large-scale developments are to take place in the coming decade, issues related to coastal flooding have been taken under discussion. As a simple means of adaptation, the strong planning monopoly of the municipalities enables deciding on lowest floor level even in the absence of national guidance. For example, Helsinki has followed one for more than a decade now. To set rules like this requires political will to act though.

4.2.2. Latvia

In Latvia, both mitigation and adaptation are discussed, but actual policies mainly refer to mitigation. This corresponds with the information collected on climate change strategies under ASTRA (Talockaite 2006). The strategies are actively updated, however, and have an impact on energy- and spatial planning policies. What is good to notice is that the climate change issues are found highly important and thus discussed on both national and international forums. Systemic readiness exists but the tools to implement climate change issues into spatial planning practices are still lagging behind. There also seems to be a bit of uncertainty on whether this information actually reaches the actors it is intended for. In other respects the overall situation of Latvia resembles that of Finland.

Latvia hosts 26 districts, seven city districts and over 500 municipalities (Nordregio 2000). Both districts and municipalities take part in spatial planning activities, districts through territorial planning. Division of power is different from other Baltic states, so that the regional level is administered through a two-tier system where municipal mayors form a district council that guides the district office (Nordregio 2000).

While the planning system in Latvia is seen as effective, giving local actors administrative powers and active participatory planning, knowledge of local actors in spatial planning on actual climate change policies is poor. Recently, many municipalities have been found still to have little experience in producing spatial plans in general (Nordregio 2000). In fact, in 2000 only 22 municipalities had enforced local municipal plans, with the same amount being drafted. Over 200 municipalities were

working on general plans, leaving half of the municipalities without a valid plan, although required by law (Cace and Mihailova 2000). Because of the lack of resources and because of ongoing administrative territorial reform, the work has been seen to progress slowly (Cace and Mihailova 2000). This, in addition to the fact that the mayors of municipalities have considerable power through the district council it is actually the mayors and district administration that often guide local planning (Nordregio 2000).

The spatial planning system in Latvia provides with participatory means, but a final approval of the plan from all participants is not needed for it to be valid (Cace and Mihailova 2000). Lack of knowledge on climate change impacts applies to individuals and potentially diminishes their chances to participate in this respect, to lower their own vulnerability. For spatial planning, too, the lack of understanding on concrete effects perhaps is the reason why awareness is seldom seen to lead to action. Another reason without doubt is the insufficient co-operation between different local actors (Cace and Mihailova 2000). Some resistance towards 'top-down' –guidance from the EU can also be seen, according to our study (Apene 2007).

Latvian planning practices have some positive characteristics that many countries are missing. One is the seemingly open co-operation between municipalities in the form of participation in several inter-municipal planning regions (Nordregio 2000). Together with the powers of district administration to organise planning on several municipalities' areas, the planning structure can be seen fit to actively promote the kind of regional approach to the effects of climate change that the effects of it calls for, in the form of flood risk minimization for example. The problems of the young planning system are many, including the notion of local governments using plans inadequately as the basis of their decision making (Cace and Mihailova 2000). Some of them may have been resolved since their study, however.

4.2.3. Germany

The fact that Germany is a federal republic makes the German spatial planning system slightly different from the other countries of the BSR and it actually does little right for Germany to be only valued on a national level. Because of the large spatial scope of this study, this approach was chosen however. It is to be kept in mind, that on state level some approaches towards adaptation has been taken, each state focusing on issues of importance for them. Examples are forest reconstruction programs in Bavaria and Flood mapping in coastal states.

The principles are the same, though, with the local level having a self-governance on spatial planning and a two-tier planning structure. The role of regional (county) level varies a little from one state to another though. In the states coastal to the Baltic sea (Mecklenburg-Vorpommern and Schleswig-Holstein), regional planning is controlled by the states' spatial ministries, but as it is strategic and coordinative in nature, the municipalities still are independent in planning decisions (Janssen 2007).

In Germany, building and planning laws are set on the republic level. Beside that the republic itself does not engage in physical land use planning, but introduces national principles of land use as guidelines to the states. The federal states on their behalf compile regional comprehensive plans for the whole state or for regions that set a framework for planning actions on the municipal level. At the same time, municipal planning monopoly has a strong influence on the plans made on the regional level, so that the whole planning system is in constant dialogue between different levels of planning (Grieving and Turowski 2000).

An interesting feature in the planning system is a notion that areas which, 'when built upon, will require special physical provisions to counter external forces, or which special physical safeguarding measures are required as a protection against the elements' have to be marked in the preparatory land-use plan (Grieving and Turowski 2000). Thinking of climate change, this most likely corresponds to water management issues like flood and coastal protection, as these are high on the agenda of climate change discussions in Germany (Mattern 2007).

The formal structure of the planning system might explain why the lack of clear adaptation guidelines is so highlighted in our study. Germany is at the moment drafting a national adaptation strategy and it seems that a lack of it is reflected as a quite strong emphasis on mitigation in climate change discussion. On national level, adaptation strategies exist only in a few sectors at the moment, and they are not yet engaged in planning practices either in legal or operational terms.

Perhaps because of the seeming interplay of the planning levels, climate change information is readily disseminated to the planners in Germany. The planning system is effective, too, being participatory and giving the local actors freedom in decisions concerning land use. However, according to our study there seems to be little co-operation between different sectors engaged in the issue and the measures taken on a local level go undiscussed. Local actors, too, know more about the problem than they actively apply towards lowering the vulnerability of their areas.

It seems that the hindrances to adaptive action in Germany on the local level are to a large part a result of a lack of guidance from upper levels, especially in relation to adaptation. Therefore, the discussions on the issue might pick up as the national adaptation strategy is completed. According to our study, the first implications of this can already be seen on the themes considered most important for Germany, such as water balance, human health and impacts on biodiversity and tourism (Mattern 2007).

4.2.4. Denmark

In Denmark climate change issues are well respected and actively discussed on international forums. They still mainly refer to mitigation however and surprisingly have surprisingly little guiding role on the nation's future development. Although both mitigation and adaptation are studied, national adaptation policies are only in planning stages at the moment. The lack of higher level guidance and demand for local adaptation policies must radiate down to the local level that, according to our study, has difficulties turning national policy guidelines into concrete planning practices.

Denmark has 14 county councils and 275 municipalities (Fischer 2000). The planning system is highly decentralised and the principle of subsidiary is in effect. Regional planning guidelines are targeted to deal with issues of regional or national interest only. This means that the local actors are accountable for their own decisions, which as such is a good way to engage local actors to adaptive actions (Fischer 2000). Their readiness to implement policies indeed seems to prevail the national guidance, an interesting point of reference to Sweden.

It seems that one central problem in local adaptation is a general lack of discussion, both in a cross-sectoral manner and between the local actors. Individuals, on the other hand, are well aware on the effects of climate change and would be ready to participate in the planning process in the way the functional planning system would allow them to. In light of our study it would look like the climate change question would be increasingly relevant in local planning as well, if the active discussion on national and international levels starts to effect lower levels, too.

As a national point of interest, urban restructuring and taking brownfields into use is a current issue (Fischer 2000). This is a special case of spatial planning also referred to on the EU level (ECCP II WP II, urban planning and construction) as a noteworthy issue. This is because many of these sites are located in risky areas in terms of effects of climate change, such as flood risk, erosion and landslides (ECCP 2006). It also reflects on the growth of the urban areas that strongly affects the development of regions in the Baltic Sea region.

4.2.5. Sweden

In Sweden the discussion on climate change, both on mitigation and adaptation, seems to be very active and covers all sectors of the society. This discussion is mainly kept between politicians and scientists, however. Although the spatial planning system is open and effective as such, the knowledge of local actors is inadequate. The surprisingly low overall score of Sweden can indeed

likely be explained by a lack of interaction between the local level and that of national policy making and science.

Like in Finland, municipalities have a virtual planning monopoly in Sweden. Differing from those of Finland and the Baltic countries, the regional level planning is effectively lacking in Sweden. The nearly 300 municipalities compile increasingly strategic comprehensive plans that focus on development planning, and detailed plans (Ceginskas 2000). The role of the districts is to guide and comment on the drafting of plans and to design for traffic planning (Ceginskas 2000). Regional plans exist, but in Sweden these are drafted by municipalities in co-operation with one another and are not frequently used. The regional plan is also not legally binding (Ceginskas 2000).

The picture we get is that of Sweden being an active player in mitigation on international forums, but at the same time lagging behind in producing adaptation policies and more so in adaptation tools. Some local examples exist, but there is a general lack of communication both between the local actors themselves and more importantly between the local and national level. Recently, Sweden has set up a Commission for sustainable development that intends to better engage business, politicians and scientist into co-operation on climate issues. Their work is targeted for 2009. It has already boosted action on the local and regional levels (Forsgren 2007). The Swedish government has also ordered an inquiry into the vulnerability of Sweden. The analysis is expected to be finished later in 2007 (CIRCLE 2007).

The municipalities in Sweden have a lot of power in the decisions concerning their land use, which means that the current state of adaptation varies greatly, depending on the willingness of a municipality to take action. It also varies according to the competence of planners, which as a result of financial cuts has been seen to weaken (Ceginskas 2000). Although environmental and sustainability issues have been high on the agenda since the late 1980s, their guiding nature may not be enough to encourage local actors to take action (Ceginskas 2000).

For example, it was noted, that considering the flood risk of the great lakes of Mälaren and Hjälmaren and Vänern, the risk is much better understood on the county level than on municipal level. As the awareness of municipalities on the problem differs greatly, flood protection only takes place in isolated municipalities along the lakes' shores (Forsgren 2007). Perhaps the lack of national adaptation strategies partly feeds to the unwillingness to take action, if the importance of adaptation is not clear and other factors are seen primarily guiding the municipal development. One clear challenge is the fast rate of population growth in certain regions that, much like in Finland, hastens the planning process (Ceginskas 2000).

4.2.6. Poland

Poland is often acclaimed for having one of the most balanced territorial structures. The role of self-governments is growing, with 3 sub levels (regional, county and local) (Lendzion and Lokucijewski 2000). Out of these the 16 regions practice strategic and physical planning and the nearly 2500 (in 2000) municipalities (communes) physical planning in their area. The regional plan is a policy framework in nature and is not binding for the municipalities on local planning decisions. The state produces a strategic document on the outlines of national spatial development policies but other than that only has a legal input on the spatial planning practices. The government also does not supervise the plans made on lower levels (Lendzion and Lokucijewski 2000).

Although having a strong autonomy, the powers of local level to engage fully in planning are rather weak though. Although the planning system is 'modern' in terms of being participatory, it is seen that the participatory processes are too rigid to launch public discussion and that the local level planning focuses too much on small-scale physical planning, thus lacking local strategic plans (Lendzion and Lokucijewski 2000). Financial problems cut down the of local planning activities (EUKN 2007).

In Poland, climate change policies mainly seem to answer to the commitments of the Kyoto protocol. Adaptation strategies exist on few sectors, but they are not yet accompanied with strategies of

implementation. Co-operation between different sectors is lacking, too. This gives very little guidance for the local planners to address the issue in their work.

Whereas scientists and politicians engage in discussions about climate change, there seems to be a true lack of ways to disseminate this information to the spatial planners. It seems though that the planners themselves are not too eager to discuss the issue either, and although some local adaptive means have been introduced, these experiences are not actively shared. It may be that the lack of bottom-up feed-back mechanisms to the national level planning, mentioned by Lenzion and Lokucijewski (2000), partly inhibits or oppresses the willingness of local planners to engage in discussions. In all, though, the issue of climate change seems very unfamiliar to the lower planning levels.

4.2.7. Lithuania

The state of climate change adaptation in Lithuania is still very much in the early stages. According to our study, while the national efforts focus on fulfilling mitigation goals of the Kyoto treaty, adaptation strategies exist in few sectors only and there is little co-operation between these. Local land use planning, according to our study, is formally sophisticated, but lacking the administrative power to put the strategies into action on a local level. This applies to mitigation, too, and diminishes the possibilities of lowering general vulnerability on local level.

It must be kept in mind that the planning system in Lithuania, like in all Baltic countries, is still very young. The basis of the current planning law was only set in 1996, after decades of centralised planning with no law on planning regulation (Staniunas and Gordevicius 2000). Here, the old territorial administration structure was totally re-organized, so that only 56 (now 60) municipalities remained as local level administrative units, down from over 500 that still is reality in Estonia and Latvia (Nordregio 2000). The municipalities are governed by mayors, under whom executive boards like that of spatial planning operate.

On the regional level there are 10 counties that produce county plans. The planning system is hierarchical, so that regional level plans must co-ordinate with the long-term strategic plans of the national level and local plans with the county plans. Local level plans are also overseen by the county administration (Staniunas and Gordevicius 2000). However, local administration has no significant power over regional level decisions that guide their actions (Nordregio 2000). This might in part hinder local actors from taking adaptive actions. As the Law on territorial Planning is still new, all municipalities did not yet have an approved comprehensive plan by the year 2000 (Staniunas and Gordevicius 2000).

Another point of interest lies in the initiating and financing of local plans. Municipalities in all Baltic countries share the same inability to effectively influence their income sources. In Lithuania one third of the income comes in the form of state subsidies, as government-controlled share of income tax (Nordregio 2000). Other income sources are loans from credit markets and revenues from land and property. The situation in Lithuania is better compared to other Baltic countries however, as the large size of administrative units helps them in bargaining for state subsidies (Nordregio 2000). In Lithuania, land owners, land users, the state land manager and the mayor of the municipality all have the right to initiate planning (Staniunas and Gordevicius 2000). Private and legal entities also have the right to finance the plans, which has a potential to affect negatively on sustainable municipal planning.

According to our study, there seems to be a general lack of discussion on the effects of climate change, and although climate change information is disseminated to local stakeholders, actual discussion on how to include this information into planning practices is missing. Partly, this could be due to the focus on mitigation, to which the impact of local decisions is perhaps even harder to comprehend. A new study on the impacts of climate change, covering several sectors, is to be published in April 2007 (Merkeliene 2007). It seems that any initiatives should be included in the county plans, which again might not yet be refined to meet the challenge of climate change.

There have been some reactive adaptation efforts, though. For example, a coastal management project in Palanga is set, aiming at stopping beach degradation processes (Merkeliene 2007). It can be hoped that good examples from practical projects like these would encourage actors to more actively discuss the local possibilities for adaptation.

Coastal issues have been taken up on the national level, too, in the form of the Lithuanian Baltic Sea Coastal Management Strategy. The strategy aims to preserve natural coastal processes in the changing climate and its effects like increased incidences of storms and accelerated erosion. It is to be noted however that a great part of current long term strategies and programmes (like those on health, transport, waste management, energy and economic development) do not link to any means of climate change adaptation (Talockaite 2006).

4.2.8. Estonia

In Estonia, the entire issue of climate change adaptation is still in the early stages. Existent national climate policies almost entirely focus on mitigation and are mainly meant to fulfil the objectives of the Kyoto treaty. Although some adaptation strategies exist in certain sectors however, they have little input into the spatial planning practices. This is perhaps the reason why adaptation issues have raised little or no discussion in terms of spatial planning (Radiko 2007).

In Estonia the power over planning decisions lies strongly in the hands of the municipalities. The 15 counties in Estonia produce county plans, but lower level plans have a right to change them after being approved if needed. Readiness to assess the climate change issue on the regional level thus exists. This is in one respect 'interactive', but in the other it demands a lot from the local level (Lass 2000). In 2005 there were 227 municipalities in Estonia. Sadly, the local actors in spatial planning have little knowledge of the effects of climate change, and very little action is taken towards adaptation at the moment. This might partly be because of lack of funds (as noticed by Nordregio (2000)), but it also seems to reflect the lack of dissemination from the top-down and also a lack of discussion among the local actors themselves.

According to our study, adaptation issues are mainly discussed between the scientific community and the politicians, importantly leaving out both local actors and the public. As common understanding on the issue is low, the autonomy of the local actors on spatial planning issues is wasted in this respect.

5. Summary

This study looked at climate change adaptation from the point of view of institutional vulnerability. Focus of the study was on national spatial planning systems of the Baltic Sea region (BSR) countries. Institutional vulnerability was seen as *'the awareness on the effects of climate change, long term institutional preparedness and possibilities for adaptation, in terms of spatial planning practices, co-operation and dissemination structures'* (from Lim and Spanger-Siegfried 2005).

Looking at the issue through a meta-evaluation of country-specific evaluations done by the UNFCCC focal points (each for their own country), we were able to study differences in the attitudes, organizational structures and readiness to take action within the BSR countries. Generally, it was seen that knowledge on the problem and the need for adaptation exists, especially on the national level. This knowledge does not always reach the local (operational) level however, although in general learning and information sharing capabilities of the countries are quite high. Although the rising interest is a positive sign, adaptation at the moment clearly is not a number one policy priority.

Differences arise between countries when we study the aspects of developing policies and tools for adaptation. Usually, adaptation strategies exist only on few sectors, and they still do not have impact on actual land use guidelines. This lack of top-down policies decreases the readiness of local actors to engage in adaptation related activities. In terms of willingness of actors to address and discuss adaptation issues we found a more harmonic picture. Although generally on good level, usually the readiness to talk about possible adaptive means is higher than the will to work towards it.

According to our study, the countries in the BSR can, in terms of climate change adaptation, be divided into 3 groups:

The first group covers **Finland and Latvia**. Answers obtained from both countries reflect ***a very positive attitude towards climate change adaptation on all levels and are most actively working towards lowering their vulnerability***. Finland published a national adaptation strategy in 2005, but adaptation is also seen as very important on local and regional levels, too. This is not to say that too much actual action would have taken place, but with a positive atmosphere the municipalities can address the issue through the planning monopoly they have. On regional level the inclusion of climate change issues in regional plans is still in the early stages, but the working co-operation and discussion channels between regional environment centres and the municipalities evens this out.

The seemingly good state of climate change policies in Latvia is a surprise in this study. Although adaptation policies are only planned and local level is yet to take action, awareness of the actors is seen as good and adaptation measures are disseminated actively and discussed among the local actors. Although understandably a young system with a lot to be developed, the atmosphere created in Latvia seems, according to our study, to be a very positive one. Local level participates actively in regional level planning through municipal mayors that form district councils, guiding district offices' work. The downside is that this simultaneously puts a lot of power in the municipal mayors' hands and therefore puts a lot of weight on individual qualities.

It is to some extent debatable whether **Germany** should be included in this group. However, although awareness on climate change in general is high in Germany and the issue is actively disseminated to all levels of spatial planning, action and discussions on possible means of adaptation are lacking. Poor public knowledge on climate change adaptation issues reflects this situation. One explanation for this could be the seeming rigidity of the planning system that would require national back-up for the lower levels. Like Sweden and Denmark, the country government is only now drafting an adaptation strategy.

In **Sweden and Denmark** national adaptation strategies are being drafted. As In Germany, ***characteristic to the state of adaptation capacity in these countries is that although climate change issues are discussed a lot on national level, this either fails to reach the local actors or does not lead to discussions between them, not to mention horizontal governance to put adaptation into action***. A common feature for both countries is a decentralized planning system, where local

actors have a virtual planning monopoly. This likely highlight the negative results on lack of knowledge and discussion on local level and explains the low score the countries obtained in our study in this respect.

In Estonia and Lithuania *the climate change issue in general dealt almost solely with mitigation and in the minimum scope of the Kyoto treaty only. Poland does little better.* As the spatial planning structures in these countries are quite different, the reason for this seems to be inactivity at the national level to address the issue and a following general lack of knowledge among the lower level actors. In Poland we seem to find bottlenecks in disseminating information both top-down and bottom-up. In all three countries, information bottlenecks and a lack of funds combine to hinder the implementation of adaptation strategies at the local level.

Neither a high level of power on the planning decisions in Estonian and Polish municipalities and the interactivity of the planning system between different levels in Estonia (as opposed to the more rigid system in use in Lithuania) seem, in this respect, to overcome these problems. The newness of the planning systems in the Baltic countries can be part of the reason (in terms of competence and perspective). This said, the seeming success of Latvia to include climate change issues in their policies seems to indicate a lack of political will to address the problem in the other BSR countries. As global awareness on the problem and its general effects is high (increasingly so with the IPCC 4th Assessment Report) and more detailed prognosis on the change are readily available, the situation in Estonia and Lithuania can be seen to reflect a situation where the planning structure is sub-optimal in terms of adaptation.

This is not to say that all other countries in the Baltic Sea region would not still have to work towards lowering their vulnerability and naturally to lower their greenhouse gas emissions, too. By introducing some best practices on adaptation found in this and other studies in the following chapter, we hope to give some ideas on how to develop the national planning practices to provide a more sustainable future for all BSR residents.

6. Policy implications

Under the ASTRA -project, several studies have sought to reveal urgent adaptation issues in the BSR, find existing adaptation policies and come up with the best practices to better address adaptation needs. In this paper, three key findings are emphasized:

- 1) **Adaptation issues should cover and legally address all levels of spatial development, from EU policies to national adaptation strategies to regional plans and local level action.**
- 2) **Regional level planning should more thoroughly address adaptation issues and carry a strong strategic guidance towards local planning.**
- 3) **Social knowledge is of key importance when adaptation actions are introduced on the local level.**

*

1) Climate change adaptation has to be a cross-cutting theme in all spatial planning levels

Adaptation is a new policy area for the European Climate Change Policy. It is to be opened as the Impacts and Adaptation group of the European Climate Change Programme (ECCP II). ECCP is set to publish a Green Paper on adaptation aimed at local and regional decision makers. In the meantime, the **EU encourages the use of current EU-level policies and measures to find national adaptation options.** These include a diverse set of policies and guidelines; for example, the powerful Water Framework Directive (some shortages in terms of adaptation which will be covered by the upcoming Floods Directive), Integrated Coastal Zone Management (ICZM) recommendations and the European Spatial Development Perspective (ESDP), which at the moment does not directly address adaptation (ECCP 2006)¹⁴.

According to the final report of the Building National Adaptation Strategies thematic group of the ECCP II WG II (ECCP 2006), the main aim of the EU on this issue would be leading by example and to encourage information sharing, including co-ordinating and learning from such international works as the Stern review and those of the OECD. Providing a long-term view on climate issues is of key importance, as is financial support to certain regions such as the new member states (ECCP 2006).

Within the EU, the national level therefore still plays a key role in decision-making, together with the local level (Dasí 2006). In the Baltic Sea region, the capacity of local actors to engage in adaptive action varies greatly. The reasons are many; economic issues in terms of controlling and raising own funding for spatial development in the municipality's area; issues related to local autonomy and external pressures such as demographic changes; and characteristics of the actors themselves, mainly a willingness to be proactive and their knowledge on climate change issues. Therefore, **there is a clear need for vertical co-operation in spatial development that guarantees the allocation of research and political interest and adequate funding to the appropriate levels.**

Decisions made on the national level should be the starting point of action on lower levels. At the moment, in only a few countries in the BSR do national adaptation strategies exist or are being planned (Finland has a strategy; Germany and Denmark are drafting one). More common sectoral adaptation policies were seen in ASTRA to seldom lead to an empowering planning climate. **National, multi-sectoral strategies are needed, bearing in mind that by definition a policy holds both the objective and means of implementation.** Depending on the structure of the spatial planning systems, barriers for facilitating climate change adaptation

¹⁴ For a complete list of EU policies referring to climate change, please see European Climate Change Programme II, Working Group II (Impacts and Adaptation). Regional Planning, Energy and Public Infrastructure and Structural Funds Sectoral Report at http://forum.europa.eu.int/Public/irc/env/eccp_2/library?l=/impacts_adaptation/environment_infrastructu/regional_sectoral/ EN_1.0_&a=d

should be recognized and eliminated if possible (see e.g. ECCP 2006).

A working top-down planning system with proper amount of autonomy on each level is seen as crucial for addressing the need to adapt. This remark relates to governance¹⁵. Governance takes different forms depending on local circumstances and independent of model of state for example (Dasí 2006, see also Hilpert 2007 (forthcoming)). The aim of territorial governance is to create an enabling environment for collective action (Dasí 2006).

One obstacle observable in our study is the continued lack of implementation of national climate change adaptation and mitigation goals into planning legislations. This causes adaptive actions on local level to lack the legal backing needed for their implementation, as they at times are hard to justify to local stakeholders, in economic terms for example. In Finland where a national adaptation strategy was published as early as 2005, a revision on the Land Use and Building Act is expected soon. It must be noted, though, that in all of Europe, the vertical dimension of governance in general is far better evolved than the horizontal (cross-sectoral) dimension (Dasí 2006). **Ultimately, climate change adaptation has to be included in national land use acts as a precondition for creating safe environments.**

In terms of planning systems, it is seen that a very decentralized planning system such as that of Germany may hinder working adaptation (Penn-Bressel, ECCP 2006 (minutes)). Complex spatial planning legislation can be a source of arbitrary decisions and even corruption. We are happy to notice that in the BSR countries including the new EU member states the situation seems to be developing towards a simpler and transparent legislation (Wassenhoven, Sapountzaki et al. 2006). **It can be seen that an ideal planning system would be one offering the local level autonomy on planning decisions and a steady, independent base of funding. Because of the long time-scale of climate change and the uncertainties attached to downscaling of the results of global climate models, this has to be coupled with strategic planning and regular communication with regional level actors, preferably including state run regional environmental centres or similar guiding agencies.**

Coordinating adaptation: Lessons from Norway

It is often proposed that the main reasons for climate change adaptation still not properly being addressed in planning practices would be the lack of knowledge of the planners themselves on climate change issues and impacts, or their uncertainty of the need for action. For the local level the question of the need for adaptation is tricky however. As the exact regional impacts of climate change are still somewhat a subject for speculation, accurate codes of conduct and justifications for economic benefits from adaptation are hard to come by.

A recent Norwegian study on institutional adaptation to climate change (Naess, Bang et al. 2005) introduced results similar to those obtained in this study. In brief, it was seen that climate change issues are taken into account in spatial planning when 'local, political and economic interests coincide with national level willingness to pay and provide support', but that this does not take place unless the institutional structure as a whole is proactive towards adaptation (Naess, Bang et al. 2005). It was also noted that the new perspectives on (in this case flood management) activities take time to filter down from the national level to the local.

Based on this study and reflecting on those made on flood control in Norway and Finland (Naess, Bang et al. 2005; Peltonen, Haanpää et al. 2006) it seems that will to act may be an even bigger obstacle for adaptation than the lack of funds. To underline this, a recent study from the Potsdam Institute for Climate Research (PIK) (Kropp and Eisenack 2007) even showed that the potential damages related to coastal flooding in the BSR in the long run would generally greatly exceed the cost of adaptation, thus effectively leaving the discussion on cost of adaptation meaningless in some sectors. Only in Estonia would the cost of creating coastal defences and coastal nourishment programs be so substantial that the cost of these adaptation means would exceed the costs of lost assets.

Even substantial information sharing and common understanding of the problem does not always lead to action, even

¹⁵ Governance can be defined as 'a process of the organization and co-ordination of actors to develop territorial capital in a non-destructive way in order to improve territorial cohesion at different levels' Dasí, J. F. (2006). ESPON project 2.3.2. Governance of Territorial and Urban Policies from EU to Local Level., ESPON, Luxembourg: 1328.

when the municipal funding base was strong. This was observed in this study to be the case in Finland. The same was found to be true in Norway, the adaptive capacity of which by most indicators would be high (Naess, Bang et al. 2005). Interestingly, Naess et al. (2005) also observed that in the municipalities under study the will to act rapidly grew following a natural hazard event, leading to construction that greatly lowered local vulnerability. This was seen to reflect local power structures and the importance of political will to address these problems (Naess, Bang et al. 2005).

As personal skills and wills of the local actors (politicians and planners alike) still differ, too, the institutional structures gain more weight (Naess, Bang et al. 2005). In order to act to reduce local vulnerability, the local actors in the current planning system without a doubt need the backing up of higher levels of strategic long-term planning and political support from different levels. This view is backed up by the planners themselves, according to Wilson's (2006) studies. It can be seen that a strong interaction between different levels of planning like in Germany could be a way to speed up the filtering process of adaptation practices. To equalise the capabilities of municipalities to adapt, the issue should be made concrete on a higher level, at the same time remembering the need for local knowledge to determine the most locally suitable means of adaptation.

In some cases, the municipalities even expect the government to deal with major natural disasters like floods that are seen to be outside their coping capacity. Still, if the issue is seen to be of economic and political importance, even quick action can be taken on local level towards adaptation. The trouble then is that, following a disaster even for example, adaptive action can be over-the-top or potentially even harmful in other respects, as guidance from other levels is lacking and personal emotions take over (Naess, Bang et al. 2005).

In this study, the balance of responsibilities between different levels of planning really seems to be a key issue. In a country like Norway, where national laws, guidelines and budget allowances have a strong guiding function on local level actions for example, the institutional structure may hinder proactive management of the effects of climate change (Naess, Bang et al. 2005).

Norway is a slightly risky example in the sense that the country scores very low on both horizontal and vertical coordination of spatial planning related activities (Dasí 2006). However, it can be seen from this example that in general there has to be will on the national level to address the problem of climate change adaptation, before the local level can be expected to act. This can be clearly seen in our study. For example, the overall lack of adaptive action in Estonia starting from the national level and in Germany, where the lack of national adaptation strategies seems to hinder taking up adaptive means on the local level, despite the otherwise functioning planning system.

2) Strategic guiding role of the regional level has to be strengthened

There are multiple hindrances to the compilation of local adaptation policies and means, even if the issue was taken up on national level. Wilson (2006) provides an example from the UK, where during the period of 2000-2005 the national planning policy statements on climate change have emerged. They have not driven the production of local plans however. Out of the studied plans revised during the study period only half had acknowledged climate change as a noteworthy factor and all of these plans were strategic in nature (Wilson 2006). The study repeats the attitude already noticed in the earlier stages of ASTRA-project, that true actions towards climate adaptation by the means of spatial planning are few and hard to come up with. In the BSR, this might be partly explained by the youth of many of the planning systems.

Ensuring adaptation through local vulnerabilities is a process demanding knowledge of the effects of global climate change, national and international responses and local conditions it affects. Although many countries found to be less established than the local level, regional level is taken up as a key player here because of its mediating role between 'broad aspirational approach' of the national level and that of actual adaptation done on the local level (Bould 2006). It can also downscale global research knowledge to suit local needs. **The wider spatial scope of regional planning helps tackle climate change issues critical to the BSR** (such as floods in different forms and the continuation and maintenance of green belts) **that call for wider spatial views than a single municipality could offer.** In terms of flood risk especially, dealing with the issue on the whole catchment area helps to guide actions in areas where they are ecologically and economically most feasible (Peltonen, Haanpää et al. 2006).

Strategic inter-sectoral planning is seen as a way to overcome the current weaknesses in horizontal governance. The problems mentioned are going to persist, as the number of actors and interactions increases and territorial governance becomes increasingly multi-level in nature.

The theme of climate change in regional plans is paired with such variable topics as sustainable development, infrastructure, inter-regional links and quality of life, together with smaller (spatial) scale issues

like waste management and housing (SWRA 2004; SEERA 2007). Climate change, indeed, affects many of these issues. The plurality of issues at hand underlines the importance of regular meeting between actors from different sectors. Regional strategic planning could clearly define the areas safe or suitable for land use and development and state legally binding obligations for the development of less suitable areas. It would shorten the chain of social learning needed to implement new guidelines and practices, and still leave local actors flexibility to adopt adaptation strategies suitable for their needs. **Strategic planning on the regional level could be guided to address regional vulnerabilities towards climate change and guide development towards less vulnerable areas.**

This underlines the importance of the working framework-design taking place on the regional level, that enables implementation on the local level (Dasí 2006). Therefore, we conclude to propose that climate change adaptation should more strongly be taken as a part of regional planning practices, or practices similar to the district planning over the territory of multiple municipalities in Latvia. The structure of regional level governance embedded in the national planning systems of the BSR is relatively uniform, only the powers of regional level differ from one country to another.

The regional level, with more long-term strategic view on spatial development, is a natural actor to turn long-term national level adaptation guidance into legitimate planning solutions. If this approach would be coupled with regional environmental centres (like those in Finland) and active discussions between actors and different sectors, local knowledge could be readily incorporated into scientific discussion on the issue.

The development of governance practices takes time and the increasing number of participants complicates these practices further. Therefore governance development takes both time and monetary assets (Dasí 2006). This relates to the problem of inequality between addressing powers and funding between the spatial planning levels (Wassenhoven, Sapountzaki et al. 2006). Although both a strong monopoly on any level or a weakness in terms of lacking political or economic powers is a hindrance on functional vertical governance, the role of regional level should by no means be forgotten.

Regional level as a mediator; lessons from the UK

Governance practices are already an integral part of policies dealing with climate change issues in the UK. To support this work, the UK Climate Impacts Programme (UKCIP) was set up in 1997 to provide guidance and support in research of national and regional impacts of climate change (UKCIP 2007). The trend of regional level gaining power is also seen in the UK, where regional level has a strong impact on boosting climate change adaptation.

Naess et. al. (2005) have found that much learning on local level is personal instead of institutional. Therefore we come to appreciate the very different starting points from which local actors take up adaptive actions. Although the impacts might actually lower the quality of life of the residents in the long run, the reality in which the local planners work does not embolden these actors to keep the issue up when deciding on the local spatial planning practices. For local politics, it is noted in multiple countries that the relatively short terms of office tend to encourage local politicians to make decisions beneficial to the near future only (Peltonen, Haanpää et al. 2006; Wilson 2006). In addition to this, the view of the local actors is often narrow, excluding complex and multi-sectoral sustainability issues such as climate change (Wilson 2006).

Wilson (2006) adds to this list the lack of innovative policy space and hierarchical planning structure (of the UK in his case), which lays no adequate weight on the climate change issue at the higher levels. As it was noted in Norway, new perspectives are filtered by existing power structures and levels of planning (Naess, Bang et al. 2005). However, Wilson also states that in the UK local actors have failed to make progress despite 'a considerable national level commitment'. For knowledge on functioning adaptive means to reach the local level actors might take a long time, bearing in mind the often mentioned lack of discussions between lowest levels of planning and among the local level actors in particular.

If we set aside the other two critical factors for taking actions named by Wilson (2006) (partnerships for best practice sharing as noted in this study, too, and recognizing secondary benefits from tackling climate change that have limited weight in local decision making), we must consider the problem actually being on the intermediate levels of planning, where the national guidelines on land use are transformed into strategic planning decisions.

In the UK independent regional partnerships have successfully taken climate change adaptation forward, despite an intricate administrative division. Their work has brought together a large amount of stakeholders from all sectors and resulted in actual planning guidelines in the corresponding regions' spatial plans (ECCP 2006). However, the relatively uniform structure of regional level governance embedded in the national planning systems of the BSR would provide a basis for a stronger strategic planning input without such partnerships.

The current status of the regional level in the BSR varies greatly from one country to another, as does the foreseeable

development of the powers of this level to contribute to adaptation work or to governance in a wider context. In general, strengthening the regional level is seen in BSR countries like Sweden and Finland (Wassenhoven, Sapountzaki et al. 2006). This is likely partly due to the recent trend towards governance in administration, which benefits from intermediate levels in planning, and partly an outcome of streamlining national structures to better comply with the policies, programmes and funding structures of the EU (Wassenhoven, Sapountzaki et al. 2006). Again, it must be kept in mind that the current planning systems of the Baltic countries have been only recently introduced and in many respects are still searching for their form.

This does not mean that the spatial planning actors would not, at the moment, feel constraints in their funding base. For example, in Finland the regional level is financed through state administration, which can be seen limiting regional level's authority in planning issues. A similar situation is more or less common in the EU and associated with the reluctance of the state to relinquish powers (Wassenhoven, Sapountzaki et al. 2006). Under ESPON (Wassenhoven, Sapountzaki et al. 2006) it is noted, however, that the opposite situation can be a problem too; *too strong local level can override issues demanding more wide a perspective and long-term strategic planning*. The same was found to be an issue in the BSR.

Different examples exist as well. In Denmark, the number of regional authorities was recently cut from 13 to 5 and their power in land use planning is lost to the local (municipal) level. Although reducing the actual planning activities of the regional level to almost zero, this can perhaps be seen as a possibility for strengthening the guiding role of the regional level, through the demand for new regional plans that would more explicitly coordinate regional growth policies (Wassenhoven, Sapountzaki et al. 2006). In Poland the planning system was reformed in 1999 to introduce regional and local level of administration. The current 19 regional councils operating in Finland are also a recent development, having changed the formerly bi-polar system between the state and the local level only in 1994 (Wassenhoven, Sapountzaki et al. 2006).

3) Awareness precedes funds to act – social knowledge dissemination a key question

In this study the public knowledge on climate change was found to be poor in almost all countries. This means that, as with political pressure in some cases, there is no demand from the public to take up the issue in connection with the local level spatial development. For adaptation actions to take place, a sufficient understanding and acceptance of the problem is needed. Local level actors in many countries already can respond to the need to take action in the BSR, as long as they are equipped with legitimate planning guidelines from the upper levels. **To increase awareness towards proactive vulnerability reduction we need a simple, understandable and personal goal for climate change adaptation in the BSR.**

Communicating climate change is of key importance in bringing climate change closer to the everyday life of individuals. The change should not be depicted as a threat, but rather as a (these days) normal process that has to be taken into account when we create the kind of liveable environment that spatial planning has always aimed at. This could be one starting point as we look for a common goal for long term strategic planning. **The goal of climate change adaptation cannot be in dissonance with values shared by all target audiences¹⁶.**

It is debatable how to disseminate climate change information most effectively and how to engage actors. *The BSR is lacking a working co-operation on the issue as it is lacking organisations with enough weight in peoples' perceptions to actually affect on the national policies and attitudes.* In the BSR, HELCOM is the only organisation working towards a common goal close to climate change, but targeting climate change adaptation even in the coastal areas would demand a change in their viewpoint. In the UK, the Department for Environment, Food and Rural Affairs (DEFRA) is a natural carrier in changing attitudes towards climate change and the UK has been very successful in this respect (FUTERRA 2005).

In Finland several ministries working in the field of spatial development have together launched a campaign as part of the EU Climate Change Awareness Campaign. Taking the EU policies as starting point could be the only possibility for an international level approach to the issue, however. What is problematic is the mentioned large spatial scope of the EU campaigns that distort the public perception of climate change as being an issue they themselves can effect. This said, the **EU is working towards creating an enabling atmosphere and has been supporting research on climate change** (recently under the 7th Framework

¹⁶ These are simple recommendations given by FUTERRA (2005) for the Climate Change Communications Working Group in the UK.

Program for example).

Nationally it would be of key importance to clear the barriers for creating an enabling atmosphere for adaptation. **If the will to act is there, most barriers for adaptation can be cleared by closing in on the issue top-down through national adaptation strategies and bottom-up through raising awareness among wider audiences.**

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Appendix I: Scorecard for climate change adaptation in the BSR

By using the guidelines described above, a proposition for a pilot scorecard was created for ASTRA. It is based on an evaluation approach proposed by UNDP's Adaptation Policy Framework (APF) and introduced by the UNDP Global Environment Facility (GEF), more precisely on the example of "A Scorecard Approach for Assessing Market Transformation for Energy Efficient Products and Processes GEF Strategic Priority 5, Climate Change Focal Area" (UNDP/GEF 2003). The target of the evaluation is to assess the capacity of BSR countries to implement policies, legislation, strategies, and programmes. The UNDP/GEF Capacity Development (CD) approach is a conceptual framework for capacity assessment and development, developed to serve all of GEF's 22 strategic priorities. These priorities constitute GEF's work to fund environment protection projects in developing countries. Climate change is one of these priorities. For the needs of ASTRA –project, the scorecard was modified by the Centre for Urban and Regional studies of Helsinki University of Technology. In addition to the actual content of answers, each aspect of adaptive capacity was scored from 1 to 3 points on each of the three levels shown.

Pilot Scorecard with Generic CD Indicators for Climate change adaptation in the BSR

1) National capacity to conceptualize and formulate policies, legislation, strategies and programmes	
Systemic	<input type="checkbox"/> National climate policies exist, but their guiding role for the nation's future development is weak (1 point) <input type="checkbox"/> National climate policies exist and have an impact on the energy- and spatial development policies (2 points) <input type="checkbox"/> National climate change mitigation and adaptation policies exist and they are attributed to in spatial planning legislation (3 points)
Organizational	<input type="checkbox"/> National climate policies exist, but primarily focus on mitigation, leaving out adaptation policies <input type="checkbox"/> National adaptation policies exist, but are lacking strategies of implementation <input type="checkbox"/> National adaptation policies exist and they include an implementation strategy and proposals for action at least on critical sectors
Individual	<input type="checkbox"/> National strategies for climate change mitigation exist on some sectors, but they are poorly known by the key actors in local spatial planning <input type="checkbox"/> National strategies for climate change mitigation and possibly adaptation exist and are widely known by the actors in local spatial planning <input type="checkbox"/> National strategies for climate change mitigation and adaptation exist and play a key importance in guiding the actions of key actors in local spatial planning

2) Capacity of local actors to implement policies, legislation, strategies, and programmes	
Systemic	<input type="checkbox"/> National strategies for climate change adaptation exist for at least one or two sectors, but local actors in land use planning have little administrative power, and have not made strategies of implementation of adaptation policies <input type="checkbox"/> National strategies for climate change adaptation exist for at least one or two sectors, and local actors have administrative power and are working to promote local or regional adaptive means <input type="checkbox"/> National strategies for climate change adaptation exist for several sectors. Local actors have administrative power and are working actively in co-operation with other levels of governance to promote and execute local or regional adaptation policies
Organizational	<input type="checkbox"/> National strategies for climate change adaptation exist on some sectors, but they have no effect on building codes or similar, should they exist in the first place <input type="checkbox"/> National strategies for climate change adaptation exist on some sectors with propositions for revising building codes and similar planning guidelines, but they are not yet engaged in planning practices <input type="checkbox"/> National strategies for climate change adaptation have an input on practices promoting sustainable development such as building codes, and they are actively taken into account in planning practices
Individual	<input type="checkbox"/> Local actors in land use planning have little or no knowledge on the impacts of climate change and are incapable in taking adaptation policies, should they exist, into account in planning practices <input type="checkbox"/> Local actors are aware of the impacts of climate change but are incapable of turning national policy guidelines or scientific data into concrete planning practices <input type="checkbox"/> Local actors are well trained and informed on the need for adaptation and capable of turning national policy guidelines and scientific data into action

3) Capacity to engage and build consensus among all stakeholders, including individuals	
Systemic	<input type="checkbox"/> Climate change is looked at purely from the ecological perspective; no co-operation between different sectors of the society exists <input type="checkbox"/> Climate change is deal with on two or more sectors, but little co-operation between them exists <input type="checkbox"/> Climate change is taken up on all key sectors and the issue is discussed widely in cross-sectoral manner
Organizational	<input type="checkbox"/> Participatory planning in the local planning policies is limited to key economic players only; Land owners and property managers are to a large extent free to develop their property without any governmental or local interference <input type="checkbox"/> Land use planning is in effect on local/regional level and anticipatory planning is

	<p>required to include all stakeholders, including individuals, but they have little or no power over decisions</p> <p><input type="checkbox"/> Land use planning is in effective and based on rules and regulations clear and equal to all stakeholders. Participatory planning is required by law and actively practiced, including all relevant stakeholders</p>
Individual	<p><input type="checkbox"/> Individuals are ill advised on the concept of climate change and can not participate fully in planning process in these terms</p> <p><input type="checkbox"/> Individuals are aware of climate change, but do not distinguish between mitigation and adaptation and are incapable to act to lower their vulnerability</p> <p><input type="checkbox"/> Individuals are well aware of the consequences of climate change and behave accordingly to actively lower vulnerability .</p>

4) Capacity to mobilize information and knowledge	
Systemic	<p><input type="checkbox"/> Climate change is studied in the scope of mitigation obligations only</p> <p><input type="checkbox"/> Climate change is studied in terms of both mitigation and adaptation</p> <p><input type="checkbox"/> Climate change adaptation is a key concept in research and reducing vulnerability is a key concern of the climatic studies</p>
Organizational	<p><input type="checkbox"/> Climate change information is actively disseminated between scientists and politicians only</p> <p><input type="checkbox"/> Climate change information is actively disseminated between scientists and politicians but local planners are often informed, too</p> <p><input type="checkbox"/> Climate change information is actively disseminated between scientists, planners and politicians on regular basis and on multiple levels of the society</p>
Individual	<p><input type="checkbox"/> Local planners receive climate change information, but do not engage in discussions about adaptive or mitigation means</p> <p><input type="checkbox"/> Local planners are informed on the need for adaptation but discussion leading to action is missing</p> <p><input type="checkbox"/> Local planners work in close co-operation between the governmental offices and all relevant actors in the area; Climate change adaptation is widely discussed and local actors are well informed about the problem</p>

5) Capacity to monitor, evaluate, report, and learn	
Systemic	<input type="checkbox"/> Climate change issues are dealt with and disseminated in the minimum scope of the Kyoto protocol <input type="checkbox"/> Climate change issues are actively promoted nationally in a way more active than what the international treaties expect <input type="checkbox"/> Climate change issues are well respected and actively promoted on international forums
Organizational	<input type="checkbox"/> Climate change mitigation strategies are updated regularly <input type="checkbox"/> Climate change mitigation strategies are regularly updated based on evaluations on vulnerabilities, adaptation strategies are planned <input type="checkbox"/> Climate change mitigation strategies are updated regularly and adaptation policies are actively developed
Individual	<input type="checkbox"/> Local adaptation measures take place, but are not discussed or evaluated <input type="checkbox"/> Local adaptation practices are discussed and developed with other relevant actors <input type="checkbox"/> Good adaptation practices are systematically collected and discussed both among planners and other actors in the national scale

Has the issue of adaptation raised discussion in your country, especially in relation to spatial planning?

- No
 Yes

If it has, could You shortly describe in the box below

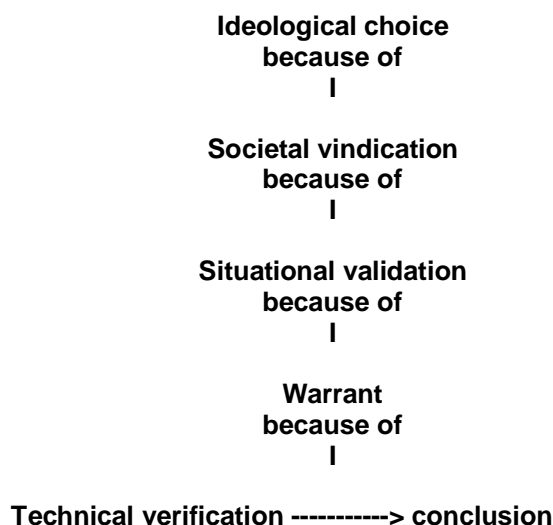
- the key issues discussed,
- groups of actors that have been active in the discussions and
- possible conflicting views on the issue in respect to the existing national strategies on climate change?

The answers to this question would be considered as a starting point for possible future stages of the adaptation policy evaluation.



Appendix II: Policy evaluation framework

The approach used in this evaluation defends its place on national level, but it is to be noted that a situational validation by local stakeholders is needed to operationalise the policies under study. In fact, Frank Fischer (1995, 2006) proposes that policy evaluation should be widened from the pure technical verification of the policies to cover the justification of norms and standards underlying the scope of evaluation. In the scope of this study a through evaluation like this is not possible because of the large area the study covers, and we underline that the evaluation depicts the current state of adaptation only. It is important to keep in mind the many reasons possibly affecting the felt need of adaptation however. The following graph relates technical evaluation into the idea of a holistic policy evaluation (according to Fischer 1995):



Here, the first-order evaluation covers the technical verification and situational validation that focus on the outcomes and objectives of the policies. These are the practical questions that determine the success of the policy in national and regional context, and can be approached through an analysis of the national policies collected under ASTRA by using the scorecard introduced in this study.

For the societal vindication and ideological choice however, we would have to look at the policies in wider context. These second-order levels look at the goals and values of the policies, in other words their instrumental or contributive value for the society as a whole and the legitimacy of the ideology behind the scope of the policies. Actually, the warrant shown in the graph is an interesting stage, as it connects all the above mentioned questions to the technical verification; the warrant used must be justified by the second-order questions. It also gives the right for all stakeholders to take part in the discussion on the policies, as the norms and standards affecting behind the warrant must be jointly approved (Fischer 2006).

Appendix III: Glossary of terms

(Taken from Schmidt-Thomé, P., Ed. (2006). Natural and Technological Hazards and Risks Affecting the Spatial Development of European Regions. Geological Survey of Finland, Special Paper 42. Espoo, Geological survey of Finland. <http://www.gsf.fi/projects/espon/glossary.htm>)

Coping capacity: Capacity refers to the manner in which people and organisations use existing resources to achieve various beneficial ends during unusual, abnormal, and adverse conditions of a disaster event or process. The strengthening of coping capacities usually builds resilience to withstand the effects of natural and other hazards.

Disaster: A hazard might lead to a disaster. A disaster by itself is an impact of a hazard on a community or area – usually defined as an event that overwhelms that capacity to cope with.

Exposure: The economic value or the set of units related to each of the hazards for a given area. The exposed value is a function of the type of hazard.

Hazard: A property or situation that in particular circumstances could lead to harm. More specific, a hazard is a potentially damaging physical event, phenomenon or human activity, which may cause the loss of life or injury, property damage, social and economic disruption or environmental degradation. Hazards can be single, sequential or combined in their origin and effects. Each hazard is characterised by its location, intensity and probability.

Land-use planning: Land-use Planning creates policies at the local/municipal level that guide how the land (inside the administrative borders of a municipality) and its resources will be used. The main instrument of land-use planning is zoning or zoning ordinances, respectively. Land-use planning is situated below the regional planning level.

Losses: The amount of realized damages as a consequence of an occurred hazard.

Mitigation or disaster mitigation: A proactive strategy to gear immediate actions to long-term goals and objectives.

Preparedness: Readiness for short term activities, such as evacuation and temporary property protection, undertaken when a disaster warning is received.

Recovery: This constitutes the last step of post disaster actions, such as rebuilding or retrofitting of damaged structures.

Regional plan: (as defined for the purpose of ESPON 1.3.1 Hazards): The spatial plan of an administrative area (superior to the municipal level); is part of the official (national or federal) planning system; makes statements and/or determinations referring to the spatial and/or physical structure and development of a region (spatial distribution of land use: infrastructure, settlement, nature conservation areas etc.); has impacts on the subordinate levels of planning hierarchy (local level, e.g. municipal land use plans etc.); textual and cartographic determinations and information normally refer to the scale 1:50 000 to 1:100 000.

Regional Planning: Regional planning is the task of settling the spatial or physical structure and development by drawing up regional plans as an integrated part of the formalised planning system of a state. Thereby regional planning is required to specify aims of spatial planning which are drawn up for an upper, state, or federal state wide level. The regional level represents the vital link between the state-wide perspective for development and the concrete decisions on the land use taken at local level within the land-use planning of the municipalities.

Risk: A combination of the probability or frequency of occurrence of a defined hazard and the magnitude of the consequences of the occurrence. More specific, a risk is defined as the probability of harmful consequences, or expected loss (of lives, people injured, property, livelihoods, economic activity disrupted or environment damaged) resulting from interactions between natural or human induced hazards.

Risk assessment: Risk assessment consists of risk estimation and risk evaluation.

Risk estimation: Risk estimation is concerned with the outcome or consequences of an intention taking account of the probability of occurrence.

Risk evaluation: Risk evaluation is concerned with determining the significance of the estimated risks for those affected: it therefore includes the element of risk perception.

Risk reduction: Risk reduction may be defined as the “consequence of adjustment policies which intensify efforts to lower the potential for loss from future environmentally extreme events.” (Mileti, et al. 1981; Nigg and Mileti. 2002). Such adjustment policies may refer to a broad range of guidelines, legislation and plans that help to minimize damage potential (i.e. exposure to a hazard or maximizing coping capacity of a region or community by, e.g. guaranteeing resources and preparing adequate plans for pre-disaster mitigation and post-disaster response measures). Risk reduction involves both policy/regulatory issues and planning practices. In other words, risk reduction – as defined above – is the result of what has earlier been defined as risk management related response (prevention orientated mitigation, non-structural mitigation, structural mitigation, and reaction).

Sectoral planning: ‘Sector’ in terms of ‘sectoral planning’ means the spatial planning under consideration of only one planning criteria (e.g. traffic, environmental heritage, etc.). Sectoral approaches are (in the ideal case) weighted and combined in the context of comprehensive development planning. Sectoral as well as comprehensive planning can take place on different administrative levels.

Sensitivity/highly sensitive areas: In general, sensitivity describes how a system responds to permanent influences. In the context of the ESPON 1.3.1 Hazards project, the highly sensitive areas are defined as those areas that are most sensitive towards the entirety of all hazards. In terms of the chosen methodology the highly sensitive areas are represented by risk intensities of 8, 9 and 10 (red, brown and black colours in the colour scheme of the synthetic risk map).

Vulnerability: Vulnerability is the degree of fragility of a person, a group, a community or an area towards defined hazards. In a broader sense, vulnerability is defined as a set of conditions and processes resulting from physical, social, economical and environmental factors, which increase the susceptibility of a community to the impact of hazards. Vulnerability is determined by the potential of a community to react and withstand a disaster, e.g. its emergency facilities and disaster organisation structure (coping capacity).