Climate change and spatial planning in the Baltic Sea region – reducing risks or raising vulnerabilities?

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This paper studies institutional vulnerability of spatial planning systems in the countries of the Baltic Sea region, towards the effects of climate change.

Based on two linked studies, we give a first insights into the current state of spatial planners' awareness of the problem, long-term institutional preparedness and possibilities for adaptation that is agency, and association, the co-operation and dissemination structures leading to adaptive action. It also discusses the interplay between different levels of planning and the question of responsibilities.

The results presented here are based on studies made by the YTK Centre for Urban and Regional Studies under the ASTRA –project in 2007. They were first presented in the Final international ASTRA conference in Espoo, Finland in December 2007. The results will be published more in detail in a scientific form later in 2008.

Adaptation issues are gaining strength in climate policies

Climate change is a global problem. Mitigating global warming calls for intergovernmental approaches, most notably 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 countries in the world to work together against human-induced climate change. In late 2007, the process continued in Bali, where a 'roadmap' for future negotioniations on emission reductions was set out. It is obvious, that people's perception of the risk has grown over the past years.

Recently, the perspective of impacts and adaptation has become more prominent in climate policy. In Bali, an adaptation fund was launched to assist the developing country parties to the Kyoto protocol to engage in adaptation. The EU on its behalf published a Green Paper on Adaptation, marking a new approach to climate change. Both the UNDP and the International Red Cross have addressed the need for adaptation in their recent reports. Most noticeably however, there has been a shift in the tone of these reports, stating climate change being with high certainty mostly man-made. This was evident in the fourth assessment report of the Intergovernmental Panel on Climate Change (IPCC).

Human activity is the driving force behind growing risks related to climatic events. Major weather-related disasters taken place during the recent years in the developed countries (such as hurricane Katrina in 2005 and the 2003 heat-wave in France) have shown, that event wealthy societies can remain vulnerable to climatic events. Current socio-economic trends such as increasing development of coastal areas and the following accumulation of assets in these potentially vulnerable areas underlines the need to adapt to the changes perceiced.

Together with risks, fears and insecurities related to them have gained strength, too. One interesting topic is that of responsibilities related to climate change adaptation and to possible costs of weather-related impacts. The cost of maladaption was highlighted in the Stern Review on the global economic impacts of climate change, released in 2006. For the Baltic Sea region, ASTRA -project offered first insights into the costs related to climate change, through calculations on the cost of coastal protection in the countries of the Baltic Sea region (Eisenack & Kropp 2007, intern project document).

Vulnerability to climate change is a human creation

This paper studies in detail the topic of vulnerability, understanding of which is central in understanding the need for adaptation. The paper especially discusses the aspects of institutional side of vulnerability. In short, this means the functioning capacity of different actors and institutions related to adaptation work. The paper has a special focus on spatial planning systems, seeing the importance of spatial planning and –development in creating resilient communities against climate change.

Above all, the aim of the paper is to get an overview on the state of institutional vulnerability in the Baltic Sea region (BSR) and to give ideas about aspects of it that might have a marked impact on the success of drafting and implementing adaptation policies. This serves as a contribution of the ASTRA –project to introduce best practices and to develop policy recommendations in respect to adaptation to climate change in the Baltic Sea region.

This 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. In the second phase of the study, the themes introduced above were transformed into a questionnaire studying the views of planners working on local and regional level on these same issues. A total of 494 questionnaires were sent to all coastal municipalities and regional offices bordering the Baltic Sea, Including the Atlantic coast of Denmark. A total of 171 answers were obtained from all states bordering the Baltic Sea, with the exception of Norway. The answers from local and regional level were congruent in the topics covered, and were therefore analysed together.

Regional vulnerabilities have many faces

Preparedness for likely increasing incidents of extreme weather events, such as storms and droughts, and for other anticipated effects of climate change is one crucial precondition for adaptation to climate change. Vulnerability means the susceptibility of a society to foreseen or anticipated (climatic) risks and to what extent the society has locally prepared itself for these by either planned or reactive means. When the system at hand fails to anticipate for the future or is incabable to adapt to it despite better knowledge, we talk about institutional vulnerability.

The need to adapt to the impacts of climate change is a local issue, stemming from local vulnerabilities. Vulnerability of a given region can be divided into aspects of physical vulnerabilities (geographical characteristics of a place), social vulnerability (equity issues, income), but also into cognitive (awareness of the risks) and institutional side (functioning of the societal systems).

In all, institutional vulnerability covers the awareness of the actors on the effects of climate change, long term institutional preparedness and possibilities for adaptation and co-operation and dissemination structures. Adapting to climate change not only calls for information sharing, but also working structures through which the interested actors can act. It also calls for co-operation, both between different levels and sectors of the society and interested individuals.

Extereme events work as eye-opener for vulnerability

In January 2005 the Baltic Sea region was hit by a fierce winter storm. Strong winds and floods pushed by them caused a wide array of damages in all countries of the region, totalling some 1.5 billion euros in insured losses alone. Coastal floods and erosion, power cuts and forest and property damages were but a few of the effects felt. Hardly any sector of the societies was left untouched.

As stated by UNDP, although there is a potential catastrophic risk for everyone, short and medium-term distribution of costs and benefits from climate change will be far from uniform. Although a single event, a study made under ASTRA on the January 2005 storm interestingly showed how complex the direct and mediate impacts related to extreme events can be, and how vulnerabilities vary even around a comparatively small water body.

The January 2005 storm offered a valuable example on this. The record high sea-level raised by the storm had little effect in Helsinki, Finland, but caused some 9 million euros worth of damages in Pärnu, Estonia. Apart from the characteristics of the coastlines themselves, equally important was the social input towards minimizing risks related to human interventions in these areas. Rules and regulations imposed on coastal construction such as lowest construction levels in effect in Helsinki are critical factors for planned adaptation, whereas for reactive adaptation the preparedness and co-operation structures of various actors to lessen the damages was a key when the situation was on.

There seems to be some scientific uncertainty whether extreme weather events actually are becoming more frequent, as previously thought. A recent estimate from BACC -study indicates a cycle of 20-30 years in the intensities of storms, and the NAO index is closely linked to the variations of sea-level. Nevertheless, the accumulation of assets into vulnerable locations and the ongoing trend of growth in coastal urban areas will increase the vulnerability of the coastal societies and raise the potential cost of extreme weather events, thus leaving this question partly irrelevant. In many growth regions in the BSR, such as in the city of Gdansk and in Helsinki metropolitan region, demand of plots and changing functions of inner-city coastal areas bring into development areas potentially unsafe based on poor soil qualities or direct flood risks.

In all, the planners reached in our study are very concerned on issues related to water management, such as water quality issues, increase of precipitation in general and on sea-level rise and increased stormines, both related to coastal flooding ***(see figure 2)***. In addition to this, indirect impacts such as increasing periods of ice-free seas in the winter expose coastal regions to increased climatic stress that shows as increased erosion for example and negatively affects general living conditions of the

population. If natural settings indeed are to change, the vulnerabilities of coastal areas tend to increase rather than decrease.

Ill-functioning planning systems lead to institutional vulnerability

In our study, coastal areas were clearly seen as the most vulnerable exposure unit against climate change ***(see figure 3)***. Behind it forestry and agriculture sectors and fisheries followed, together with water management issues. This reflects the general views presented in the EU Green Paper on Adaptation and in other recent international studies. The UNDP Human Development Report 2007/2008 list these three among the factors that could stall human development, if not addressed properly.

There is a consensus among planners that the effects of climate change should be addressed now already. Nearly half of the planners that answered our study had studied climate change issues themselves. Even more agree knowing the impacts on their areas well. Despite this knowledge and the wide media attention climate change issues have recently received, it is curious to see that this knowledge still usually does not turn into adaptive action.

To study the institutional reasons for this, we focused on

- how the cc adaptation policies are formulated in different countries of the Baltic Sea region
- how their content is disseminated and discussed on different levels of planning and
- what kind of tools are available for planners and how they are used

In all, the key questions focus on what are the bottlenecks and developing needs of national institutional structures to better address possible cc related problems. In detail, we wanted to find out, whether something in the attitudes towards adaptation, functioning capabilities of actors engaged in spatial planning or in the skills and awareness of individual actors related to adaptation measures might raise or lower climate change related risks in different countries. Vulnerabilities of the spatial planning systems were looked at from five aspects that were

- 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.

National level action is a crucial starting point for local level adaptation

Although municipalities in most BSR countries enjoy large autonomy in planning decisions, multiple pressures and factors limit their freedom concerning planning decisions. Out of these factors, lack of legal guidelines for sustainable planning, lack of funding and lack of political interest are seen as the most crucial ***(see figure 7)***. This lack of legislative back-up was also evident in the views of the UNFCCC focal points.

Based on the studies, climate change adaptation still is an emerging issue in most of the BSR countries. In many countries, such as Sweden, Denmark, Germany and Latvia adaptation strategies

are being drafted. Finland completed one in 2005. What is more important, is that it is widely seen that the issue is not even discussed enough in national level. The lack of national initiatives likely has an impact on local and regional levels, where very few respondent state adaptation being taken up in long-term strategic planning.

Attitudes on adaptive action on the national level have a marked impact on the lower levels. Out of the planners reached, half stated that climate change issues are not regularly disseminated by governmental agencies. The situation is generally markedly better in the Scandinavian countries and Germany, worse in Baltic states. Large amount of uncertainty in this issue likely is a negative signal, perhaps stating that at least regular and well-kown dissemination channels are missing. For many, public media and the internet serve as main dissemination channels. For the latter, this does not exclude the importance of governmental sites however.

It is important to see however that information alone does not lead to an awareness on the issue, let alone action. An important point obtained from the UNFCCC focal points is that the climate strategies completed have had less impact on actual planning guidelines such as land use acts. Out of the planners, one-half saw that they have had some impact on spatial development policies, though. This is highly important, as lack of guidelines and legislation on taking adaptation into account in planning work was seen as the main obstacle for effective risk management by the planners.

The uneasiness of the adaptation issue is further reflected by the views on responsibilities of taking the effects of climate change into account in spatial planning, that was unclear to almost 80% of the respondents. It was also visible in the views of national climate strategies giving enough information on the possibilities of adaptation, which was partially or fully disagreed by 60% of the respondents. Somewhat surprisingly, the responsibilities are seen being more clear in the Baltic states other than Estonia and Poland, where also the importance of taking effects of climate change into account was voted the highest. On the other hand, the actual possibilities of taking adaptation into account in the planning work are seen smaller in these countries, perhaps because of the lack of national level strategies addressing adaptation. In these countries, the views of public and construction companies also carry more weight, which might reflect the less powerful role of the public sector actors in planning processes ***(see figure 7)***.

Conclusion

The findings made under ASTRA –project support the views stated in the EU Green Paper on Adaptation. First, adaptation can not be left to the market forces alone, public sector must definitely act on all levels, in order to lessen the local vulnerabilities. Because of the often great autonomy on planning decisions, municipal spatial planning offices carry a lot of responsibility on actual adaptation. Spatial planners in the Baltic Sea region are interested and largely aware of the climate change issue and see that the tools to tackle the problem exist. What is lacking is a clear understanding on exact impacts and responsibilities in dealing with them. At the moment, other issues related to spatial development easily override adaptation.

As one key point, it was found that adaptation issues should legally guide spatial development in all levels, from EU policies to national adaptation strategies to regional plans and local level detailed planning. The lack of clarity in responsibilities seems to indicate, that so far spatial planning has been unable to include clilmate change adaptation issues into the existing dissemination and performance structures. However, we see that improving adaptation calls not for structural changes, but managed strategies and legal guidance. It must be seen that adaptation can be very cost-effective if done in time, as seen from the Stern report.

Based on our studies, aspects of institutional vulnerability can be seen in the planning systems of the Baltic Sea region countries: national capacity to formulate policies has been weak; as a lack of knowledge on the impacts of climate change persists, dissemination structures have to be re-thought; and finally concensus building on the importance of the issue is poor, both within the planning community but also on the side of other related actors such as politicians and contruction companies. However, capacity to implement policies into the current planning structures is there.

The attitudes and capabilities towards adaptation differ to some extent in the countries of the BSR. There are positive, active 'planning climates' in some countries and inactive, mitigation oriented in others. In general, the whole question of how to approach adaptation still seems to search for its way, simultaneously on both national and local level. These levels seldom co-operate though, as is the case in cross-sectoral co-operation.

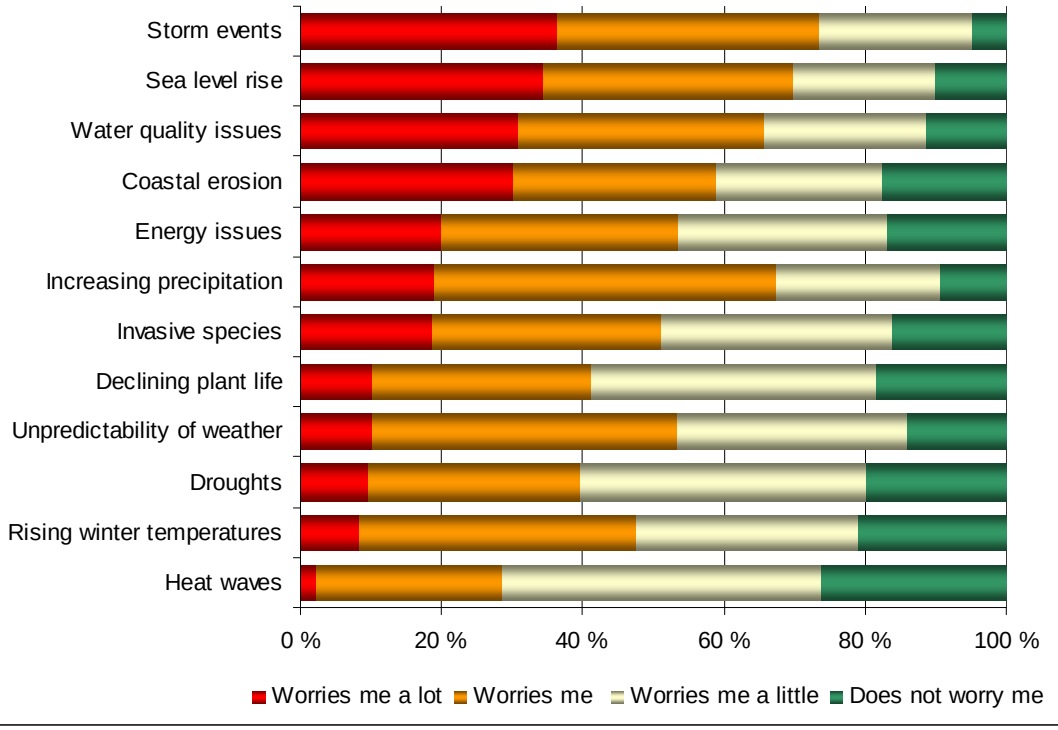
With the ongoing debate and media attention on the issue, the current situation looks less grim. Some countries have already proceeded to offer adaptation strategies, and many cities and regions have brought up ambitious aims of reducing their greenhouse gas emission. With changes in the natural environment increasingly becoming an issue for the public debates and in the media, it is likely that good examples on adaptation will be noted and increasingly applied to local circumstances. Individual events experienced both personally and through case-studies such as the one made in ASTRA are valuable in raising awareness on the possible effects of climate change. Through learning about the impacts felt in the various parts of the common water body, we can anticipate the extent and the nature of extreme weather events and the effects of them we are possibly to face in the future.

For more information in the subject, please contact simo.haanpaa@tkk.fi

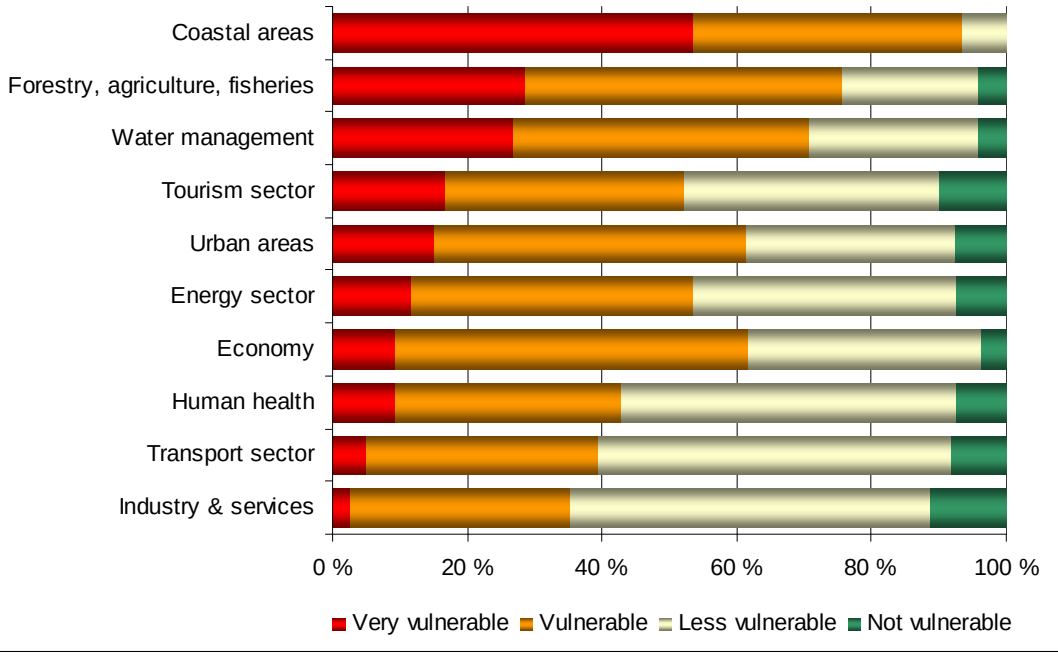
Following pages:

Selected results from a mailed questionnaire sent by YTK under the ASTRA –project to heads of planning offices of all coastal regions and municipalities in the Baltic Sea region in autumn 2007. n=171(out of 496 questionnaires sent), comparing both planning levels. Answers were almost equally divided between four groups; Finland, Estonia, Other Baltic countires + Poland and Sweden, Denmark and BSR Germany together.

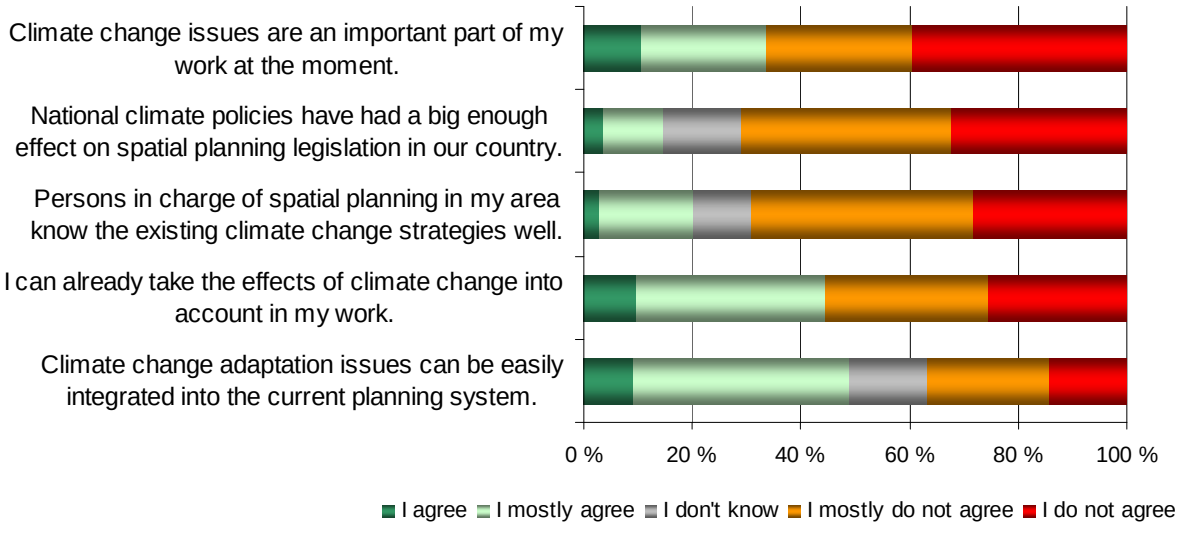
2. Which of the following foreseen effects of climate change (global warming) are you most concerned of, as a planner, in your area?



3. Which of the following do you think are the most vulnerable against the effects mentioned in the previous question, in your area? Who should seek to lower their vulnerability, in your mind?



7. What is your opinion on the following statements on tools and capabilities for adaptation?



What do you think are the biggest reasons for you NOT to be able to take the effects of climate change into account in spatial planning work?