Philipp Schmidt-Thomé and Johannes Klein

Climate Change Adaptation in Practice

From Strategy Development to Implementation

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Contents

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Communicating Climate Change Adaptation: From Strategy Development to Implementation

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1.1 Introduction

This book displays climate change adaptation measures that were developed and implemented in the Baltic Sea Region. International and European institutions, such as the Intergovernmental Panel on Climate Change (IPCC) as well as the EU Commission (2009) have identified the necessity of actions to go beyond strategies and called for the implementation of adaptation measures (IPCC, 2007; COM, 2009). Examples that demonstrate the need for the implementation of climate change adaptation measures to be politically pushed towards the local level are the resolution on resilient cities adopted by the Congress of

Local and Regional Authorities of the Council of Europe (2012), the position paper on climate change by the Association of Finnish Local and Regional Authorities (Suomen Kuntaliitto, 2010) or the recently published policy document on climate change adaptation by the German Association of Cities (2012). The latter paper lists a number of adaptation measures cities shall take into consideration for future land-use planning.

Consistent with these calls for action, the **Climate Change: Impacts, Costs and Adaptation in the Baltic Sea Region (BaltCICA)** project particularly focused on the implementation of adaptation measures, which are summarised in this book. Representatives of regional and local authorities, municipalities, research institutes of various disciplines and universities from eight countries[1] participated in the project. The BaltCICA project was the third consecutive project on climate change adaptation in the Baltic Sea Region conducted under the Geological Survey of Finland. The first of these projects, SEAREG,[2] focused on awareness raising and structuring of the science-stakeholder dialogue. The second project, ASTRA,[3] identified climate change impacts on regional development and formulated adaptation strategies. The BaltCICA project drew on the experiences of these projects and contributed to the implementation of adaptation measures. It produced new knowledge relating to climate change impacts, costs and benefits and governance of adaptation. It reduced uncertainty in decision-making in relation to adaptation by strengthening science-decision maker links and it increased participation of stakeholders and citizens in decision-making on adaptation measures.

Thirteen case studies dealt with a broad range of thematic areas, especially focusing on land-use planning and urban development for adaptation. Interdisciplinary work enabled a multi-faceted approach to these topics. This included

modelling of climate change impacts on groundwater and flood-prone areas; the participatory development of adaptation measures with the cooperation of citizens, authorities, scientists and representatives of economic sectors; as well as the assessment of adaptation options with respect to costs, benefits and less tangible criteria such as environmental impacts or aesthetics. These methods were closely interlinked in order to foster climate change adaptation at the local level.

The methodologies to identify and implement adaptation measures were developed on a local level and communicated among project partners via study visits and workshops. These workshops enabled other project partners to both learn about new methodologies and to further develop them according to specific local needs in their respective case studies.

Scenario workshops were designed and employed for direct science-stakeholder cooperation. This methodology was adapted to local circumstances of each case study and applied to identify needs and viabilities of decision-making processes towards implementing adaptation measures. Adapting or changing current land-use plans and underlying regulations, is often a lengthy process. Therefore concrete adaptation actions have been employed in only some of the case study areas, meanwhile in several other municipalities decisions are currently being taken or are high on the political agenda. In any case, the BaltCICA project has had a notable impact in the case studies on developing methodologies on how to take the step ahead from formulating climate change adaptation strategies towards specific adaptation measures.

The project partners have communicated their activities and results beyond the Baltic Sea Region and Europe. In the course of these dissemination activities several new project ideas were born. Some international activities therefore

round the book up with examples on how climate change adaptation is perceived and dealt with in areas outside of the Baltic Sea Region.

1.2 Structuring the communication processes

The identification of adaptation necessities and potentials requires interdisciplinary cooperation, not only between scientific disciplines but especially between scientists and stakeholders (including decision makers) (e.g. Adger et al., 2009; Dessai & Hulme, 2004). Therefore the communication process plays a key role. Only if decision makers, scientists and involved citizens agree on local necessities of adaptation options is it possible to develop reasonable and cost-effective options that can be implemented. For decision makers it is usually not practicable to develop measures against impacts that might potentially occur in 100 years. In the daily business of decision makers, the focus is often on current and near future land use patterns. Therefore it is necessary to understand motivations and interests of decision makers in order to find entry points in planning that may respect developments that lie in the farther future. It was shown during the project work that adaptation concepts that can be embedded into current political demands and interests raise the interest and thus also the acceptability among decision makers.

The communication with stakeholders during the BaltCICA project and its predecessors showed that overall ‘tool boxes’ are difficult to deploy or can even be counterproductive, as every municipality has its own history and special characters. An overall adaptation concept is often received sceptically, so that general concepts, for example, on how to start and endorse communication processes are helpful.

But finally each approach for every respective case study has to be completely adapted to the special requirements of each respective case study.

It also turned out that preferred adaptation options are in fact those of no-regret character, that is, those that also offer protection to current hazard patterns. It proved useful to start off with current extreme events (including historical records) rather than using those of potential flood events that might occur in the future. The potential impacts of current extreme events revealed recent developments of local vulnerability patterns. Often it turned out that assets had been constructed in unsuitable, that is, currently hazard prone areas. In the communication process land use developments and future options were then combined with potential changes in sea level and hydro-meteorological phenomena.

The combination of current and potential future land use patterns, climate variables and extreme events then lead to an integrated understanding of present as well as emerging risk patterns. In some case studies adaptation measures were designed to avoid or withstand current impacts, with an outlook on enhancing these measures along with ongoing climate change. In these cases adaptation measures are currently being put into practice. In other cases even more radical approaches of retreat were discussed, which would be implemented and aligned to the life cycles of buildings and infrastructure, and the development of climate impacts.

The examples displayed in this book show that whatever option on climate change adaptation might seem to be important from a scientific perspective, the structure of the communication process with stakeholders is the decisive factor to implement cost effective as well as politically and socially acceptable implementation measures.

1.3 Climate change induced physical impacts on the Baltic Sea Region

Impacts of climate change occur and are perceived differently throughout the Baltic Sea Region. Depending on local circumstances, climate change adaptation processes are in various stages and address different challenges. This section gives an overview on climate change impacts in the Baltic Sea Region, as based on current scientific knowledge. Local impacts are, where necessary, further described and analysed in the respective case studies.

1.3.1 Air Surface Temperature (AST)

Long-term observations of the Baltic Sea Basin mean AST indicates both decadal and seasonal trends. Annual temperature anomaly estimates show stronger fluctuations for the northern areas (north of 60°N) for the investigation period 1961--2001 (Jones & Moberg, 2003; HELCOM, 2007). Negative AST anomalies until the 1920s were followed by a first warming phase ending in the 1930s (0.274 K/decade). After a period of cooling (−0.156 K/decade) the annual AST anomalies increased steadily since the 1970s, exceeding any previously observed rates in the early 1990s (1977--2001: 0.364 K/decade) (Jones & Moberg, 2003).

For the Baltic Sea Region south of 60°N the AST development is not dramatic. Up until the 1970s, no significant AST trends can be observed. Nevertheless, an even more distinctive AST increase since 1985 (1977--2001: 0.425 K/decade) (Jones & Moberg, 2003), was recorded and was strongest south and east of Tallinn and St Petersburg due to changing patterns of the atmospheric circulation (HELCOM, 2007). The annual linear AST trends for the investigation period 1871--2004 show an overall increase of