The Social Construction of Climate Adaptation Governance: Cultural Differences in European Coastal Areas

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Abstract: The assessment of risks concerning climate change and appropriate coping strategies differ depending on cultural backgrounds. Thus to identify suitable local governance strategies coping with perceived risks, cultural characteristics need to be taken into account. Actors who want to implement solutions have to consider differences in local knowledge. We are interested in socio-spatial differences concerning the perception of climate change, reaching from the processes of construction of knowledge to the implementation of measures. Our main research question is: How is knowledge constructed and which roles do space and culture play? We highlight the ideas of local actors on threats and chances and how they depend on these knowledge bases. By understanding how decisions on climate change are made we want to gain an insight into local governance processes with focus on coastal municipalities in Europe with a special focus on cities.

1 Introduction: Cultural Differences in handling climate change?

When we started our project "How societies deal with climate change", as a part of the Potsdam Research Cluster for Georisk Analysis, Environmental Change and Sustainability (PROGRESS), we recognised that agents throughout Europe handled climate change in varying ways. Even similar climate scenarios from the natural sciences were treated differently.

In Germany coastal planning administrations came to different conclusions on how to handle the risk of a rising sea level. In 2010 the coastal administration of the German federal state of Schleswig-Holstein executed several construction works on dykes. It was decided to raise all dykes with a security measure of 50 cm. Niedersachsen, the neighbouring federal state, decided to implement an additional span of 25 cm, on top of the 25 cm that were already agreed upon before, reacting to the last IPCC-Report from 2007 (NLWKN 2010).
In contrast to Schleswig-Holstein and Niedersachsen's approach the coastal administration of the federal state of Mecklenburg-Vorpommern drew a completely different conclusion. Their coastal protection plan, published in 2009, rejected present dyke enlargements on the grounds that there is still time to adapt in the future (MLUVM 2009:99).

Differences in climate change perception also exist on other scales, for instance on the national level. In 2007 Raabe and Härtel described the perception of climate change in Poland after the last IPCC Report was published. They concluded: „In Poland climate change is discussed rarely and not perceived as a severe danger." (Raabe and Härtel 2007:1). On the other hand the German media denoted Denmark as „Climate Change-Wunderkind" (Schmitt 2007) due to the fact that Denmark had introduced a large number of climate mitigation measures since the early 1990s.

These examples show that climate change is discussed and perceived in different ways and that distinctive ways in handling climate change exist. The question is why.

A core aim of our study is to describe and explain cultural differences in the perception of climate change and how they lead to different coping strategies. To find out how societies construct climate change and react to it we want to examine how climate change knowledge becomes relevant for local decision-makers and which role spatial and cultural factors play in that process. Coping strategies to face climate change are only effective if they are supported and accepted by relevant stakeholders and if they consider and implement respective modes of perception and knowledge. Regional and cultural differences should therefore be identified to increase the efficiency and adequacy of climate adaptation measures. In this paper we discuss some preliminary results from our ongoing fieldwork.

2 The social construction of climate change knowledge: How do we focus on cultural differences in handling climate change?

Our main research objective is to closely examine the underlying logics of the constructions of knowledge on climate change on different levels and scales of society. In their book „The Social construction of Reality" Peter L. Berger and Thomas Luckmann describe how knowledge is created and how it shapes a distinctive social reality. Knowledge according to

Berger/Luckmann's theory is people's shared belief of what reality is. It is formed in complex processes of social interaction (Berger/Luckmann 1966).

In the 1990s Thomas Luckmann and Hubert Knoblauch pointed out that communication plays a very important role in these processes: by communicating actors gain shared interpretations on a subject which then become accepted knowledge in a society (Knoblauch 1995, Luckmann 2002). People's shared belief of what reality is, their knowledge, is embedded in the institutional fabric of society. The social construction of the knowledge is not apparent anymore- but seems to be an objective fact (Berger/Luckmann 1966).

Knowledge on climate change offered by all kinds of influences from other people to media, science, politics, economy is internalised differently by individuals. It is also subjectively linked with people's other interpretations of what reality is. Obviously the knowledge on climate change people internalise leads the way they deal with the issue. Therefore it is important to understand on the one hand people's knowledge construction processes but on the other hand how knowledge on climate change is constructed in the various fields of societies'. This can help to understand why and how governance conflicts and legitimation problems occur.

To comprehend the construction of climate change knowledge and analyse the subject thoroughly we use a triangulative research design with qualitative and quantitative modules. The modules are interrelated and complement each other. A quantitative survey focuses on interrelations between existing knowledge constructions of agents. In a standardised electronic survey experts from coastal communities of four European countries are asked to give their opinion on future threats and chances of climate change and possible coping strategies. Two qualitative modules closely examine the local level. The discourse analysis module shall reconstruct the local discourses of our research areas and find out about the specific evolution of local perceptions on climate change. In the expert interviews module, 40 experts from a broad range of sectors shall be interviewed in depth to understand the logic and structure of local expert knowledge.

3   Existing knowledge constructions to explore cultural peculiarities: Quantitative Survey

The quantitative research module explores the existing knowledge constructions of agents via an online-survey. We use a gross-sample of approximately 7.000 experts dealing with coastal municipalities from the Netherlands, Germany, Denmark and Poland, focusing on agents concerned with spatial development and coastal-protection in the various fields of politics, administration, environmental-NGOs, science and economy. These agents take part in regional and supra-regional decision procedures to define local climate mitigation or adaptation measures.

We use several indicators to understand individual knowledge constructions and to comprehend how these constructions are interrelated. The indicators are based on climate scenarios and adaptation measures that are discussed for our research areas. Furthermore we use indicators for knowledge constructions that are widely discussed as concepts for "culture", e.g. beliefs, identities, values and norms (e.g. Heyd/Brooks 2009, Schwartz 1999, Stern et al. 1999, Stehr 1996, Straub et al. 2002, Lalli 1992).

The acceptance of coastal protection measures

In the late 1980s Dietz et al. described how conflicts in dealing with environmental risks are socially constructed (Dietz et al. 1989). Based on this, we suppose that potential limits in climate adaptation can be discovered focusing on the acceptance of measures by agents involved in governance procedures. It seems obvious that varying preferences can lead to conflicts between agents in climate adaptation governance.

Our first empirical example addresses the differing coastal protection measures that were discussed in our research areas in the last few years. We collected a variety of adaptation measures and used them in the questionnaire to find out how well agents accepted them.

The participants had to appraise the necessity and feasibility of adaptation measures from coastal protection in the near future. We used two 5-Point-Rating-Scales to assess measures ranging from 1 "Unnecessary" / "Not at all feasible" up to 5 "Very necessary" / "Very easily feasible". Figure 1 displays the arithmetic means in a two-dimensional-plot for all agents involved.
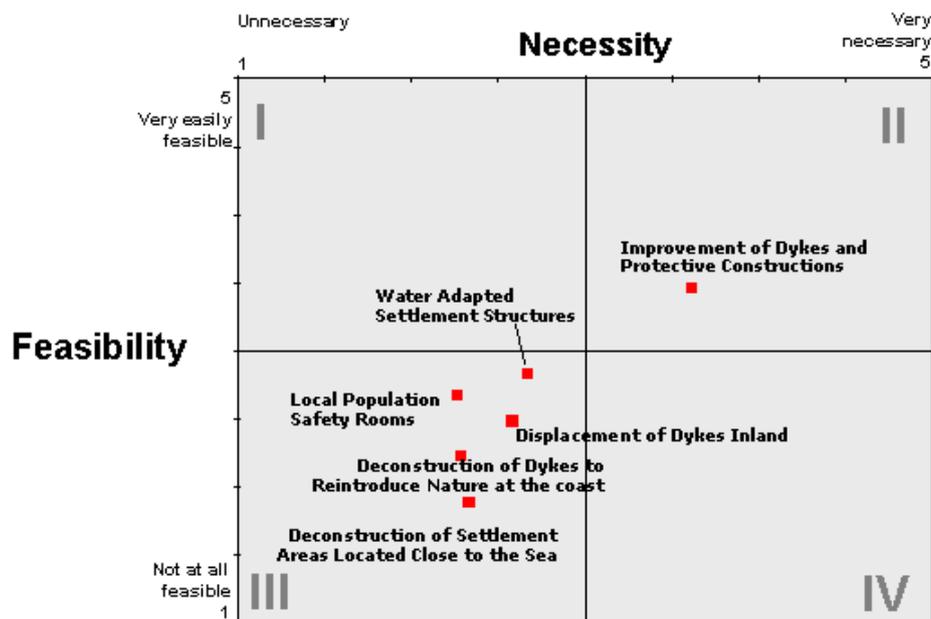
Figure 1: Acceptance of Flood Protection Measures: Total
Source: Own Calculations, n=785

On average the participants rate the measure "Approvement of Dykes and Protective Constructions" as most necessary and feasible by 2025. All other measures are part of field III (showing low acceptance). These arithmetic means only show the average acceptance and can give first impressions of tendencies in Europe. To find out more about possible agent's conflicts, we have to examine if there are differences in their interpretative framework.
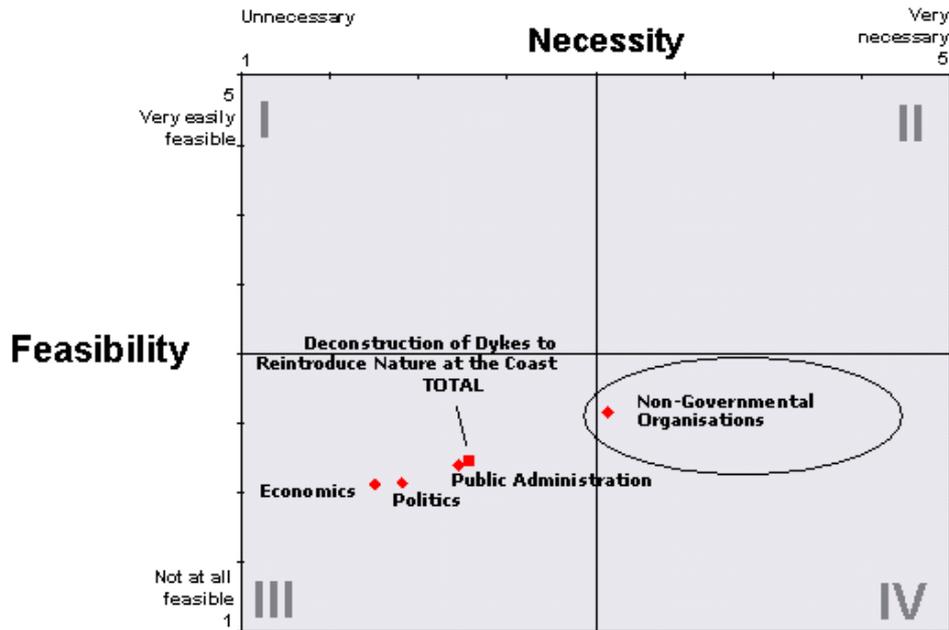
Figure 2: Acceptance of Deconstruction of Dykes by Agents from different Social Fields
Source: Own Calculations, Preliminary Results, n=785.

Figure 2 shows field specific adaptation preferences for coastal protection. In our qualitative discourse analysis we observed that the "Deconstruction of dykes to reintroduce nature at the coast" had been discussed as a possible adaptation strategy in the public media ("Hüttelmoor wird Ostseebucht" Ostseezeitung 16.11.2006, "Angst vor der Flut: Usedom wehrt sich gegen Deichrückbau, Ostseezeitung 12.3.2008). Therefore the agents were asked to appraise this strategy.

The data shows the different appraisals of experts from different social fields. For environmental NGOs "Deconstruction" seems to be more necessary than for the other fields. We suppose that there might be field-specific-logics behind these appraisals. An objective of our further research is to find out more about the logics that lead to specific differences in these fields.

In our futher research several hypotheses will be tested to explain the differences in the social construction of climate change. As shown before we use three different categories of shared knowledge constructions to examine if they interfere with the perception of threats and chances as well as with individual preferences for specific climate adaptation measures: beliefs, identities, values and norms. The following example focuses on the value perspective which was recently debated in climate adaptation governance research.

The Role of Cultural Values in Climate Adaptation Governance

Neil Adger, Karen O'Brien and others already stated that shared values might limit climate change adaptation capacity (Adger et. al. 2009: 339; O'Brian 2009). From their point of view different value orientations should be taken into account to reveal possible conflicts in climate adaptation governance.

To focus on interrelations between values and actions has a long tradition in the social sciences. First approaches were conceptualised by Kluckhohn in the 1940/50s whose definition of values is still widely used: "A Value is a conception of the desirable (...) which influences the selection from available modes, means and ends of action" (Kluckhohn 1967 [1951]:395).

In 2010 O'Brien and Wolf identify a demand for an analysis of values shared by agents involved in climate change adaptation. In this context they discussed the concept of materialism-postmaterialism from Ronald Inglehart (O'Brien/Wolf 2010: 234). At the same time they lacked an empirical analysis of its specific role in adaptation processes. To tie in with the recent debate in climate adaptation governance research, we used Ingleharts concept in our quantitative survey.

Inglehart stated that in many prosperous societies since Worldwar II, values changed from materialism- to postmaterialism-orientations (Inglehart 1977). Post-Materialists prefer non-materialistic aims, for instance individual freedom or self-fulfilment, materialists prefer materialistic aims like physical security or wealth. For Inglehart the value change resulted from increasing physical safety for people in prosperous societies. From this point of view, the relevance of problems changes when agents reach a higher level of security and wealthiness.

It has to be emphasised that the concept has been critically discussed in the social sciences. Especially the essentialistic postulation of a unique development from materialism to postmaterialism was debated as undercomplex and not applicable to all social contexts (Rössel 2011: 728ff.).

However, in this paper we want to concentrate on the idea that the individual framing of problems interelates with the agent's values. Enhancing the basic idea of Inglehart, we assume that the problem framing of climate change might also be connected to materialism-postmaterialism-orientations. Since at present climate change is not an acute survival problem in everyday life in our research areas, we state the hypothesis that post-materialists perceive climate change differently than materialists. According to that there should be observable interrelations between the problem framing of climate change and materialism-postmaterialism-orientation of the agents.

We asked our agents from spatial planning in the Netherlands, Germany, Denmark and Poland to give their opinion on the question: "Do you think climate change is a serious problem in general?". Participants rated on a 5-point-scale ranging from "no problem at all" to "serious problem".' Figure 3 shows the results.

In Germany, Denmark and in the Netherlands the frequency of those who perceive climate change as a problem is very high, between 92% in Denmark and 72% in Germany. In contrast in Poland only half of the agents (51%) consider climate change to be a problem.

Climate Change more often seems to be a serious problem for experts from the old EU-Member States than for experts from the transformational Polish society. For the moment, we would like to concentrate on the question if there are any interrelations between value orientations and the problem framing of climate change. As a first step we compare the relative frequencies of materialism/postmaterialism-orientations with the problem framing.
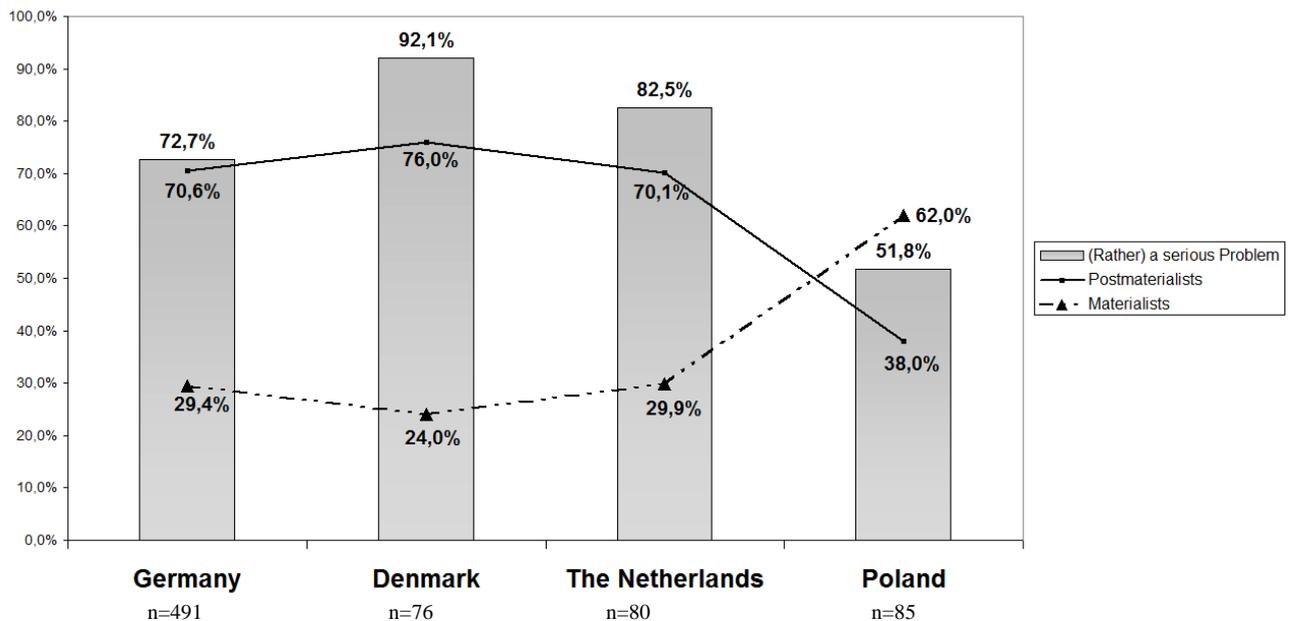
Figure 3: Relative Frequencies: Materialists and Postmaterialists in comparison to Problem Appraisals of Climate Change. Source: Own Calculations.

Comparing the postmaterialism-frequencies of each country with those of the climate change problem appraisals we recognise that the relative frequencies follow a similar pattern. This might be a first hint for interrelations between values and problem framing. The next step is to focus on the correlation coefficients.

Country	Coefficient of Contingency K
GER	0.230***
DK	0.487***
NL	0.588***
PL	0.507***

*Sig.<0.1, *Sig.<0.05, *** Sig.<0.01

**Figure 4: Coefficient of Contingency (K*) per Country.
Source: Own Calculations.**

Comparing the correlations for each nation state, contextual differences can be observed. The correlations are moderate for Denmark (K*=0,487), the Netherlands (K*=0,588) and Poland (K*=0,507), but weak for Germany (K*=0,230). In all national contexts the correlations are significant ($\alpha<0.01$ level), therefore the null hypothesis 'no correlation in the target population' can be rejected for all national contexts.

To summarise the given outcomes: We observe significant interrelations between value orientation and problem-framing of climate change. However, the intensity of the correlations varies across the countries. From this point of view further context specific peculiarities have to be taken into account in order to understand the different roles values play in handling climate change.

Luke already stated that methods to focus on different context levels are still underused in all social sciences (Luke 2004). Further research also needs to focus on multi-level-approaches to understand context specific peculiarities in climate adaptation governance. We suppose that it is necessary to look at different social scales (e.g. Swingedouw 2004, Paul (2005)) to explore cultural differences and their implications for climate change adaptation governance. To get deeper insights into the local level, we triangulate our questions with our qualitative modules.

4 Genesis of local knowledge constructions to study cultural peculiarities: Qualitative Discourse Analysis

The discourse analysis module analyses the production, transformation and circulation of collective knowledge on climate change. It focuses on the micro-level of locality looking at various fields of society.

The hermeneutical sociology of knowledge in a Berger and Luckmann tradition mainly concentrated on knowledge created in face-to-face interactions rather than on collective knowledge (Keller 2005). The Sociology of Knowledge Approach to discourse analysis can fill this gap and enables an insight into shared knowledge of a society by combining Berger and Luckmann's theory with the discourse theory of Foucault (ib. 2005). Kellers approach shall be an „extension (against reductionist adoptions of the Berger/Luckmann tradition) to include all social levels of institutional and organisational circulation of knowledge. (...) The notion of discourse is well suited to analyse social processes, practices and politics of knowledge in modern societies as *discourses*. It helps to provide a more subtle theoretical understanding of the otherwise rather static idea of 'stocks of knowledge'." (Keller 2005: 3).
It is communication that makes collective knowledge evident. Recurring patterns of communication that are bound to each other by the same topic shall be called discourses. In a social constructionist tradition discourses are collectively shared interpretations of what reality is which influence people and social fields of practice but can also be influenced by them (ib. 2005: 6).

In our research project we analyse local discourses on climate change of the German coastal towns of Lübeck, Bremen and Rostock, looking at the most widely spread local newspapers. Focusing on a period of time from 2003 to 2010 the general evolution of the topic as a local issue is studied. To get an overview of local communication on climate change discourses of different sectors of society like economy, administration, politics are also examined. Finally the results will be compared to findings on how national discourses are structured by analysing national papers.

First Results: Lübeck and Rostock media discourses on climate change

The German coastal towns of Lübeck and Rostock were chosen as research objects because both cities are similar in a lot of respects. They are situated at the Baltic Sea- with a similar size and structure. Furthermore they currently face the same problem of a severe financial situation.

At first glance even the media discourses on climate change seem to be quite similar: in both towns not much attention seems to be drawn to the topic as a local issue. Nevertheless the hermeneutic analysation of media articles shows distinctive differences in the perceptions and the subsequent measures to deal with climate change:

Lübeck
How constructions of the local history interrelate with perceptions of climate change

In the entire research period the Lübeck media discourse focuses predominantly on the global impacts of climate change. However, there is a tendency to localise the potential threats of climate change as well. Especially the old town of Lübeck with its distinctive landmarks is perceived as being at risk by a rising sea level.

Focusing on the preservation of Lübeck in the far future shows a strong identification with the town. The self-image of the town is derived from the medieaval past when Lübeck was a powerful hanseatic city rather than from its current position in Germany. The hanseatic tradition is still vivid in the town and apparently new topics like climate change are discursively linked with the historic local narrative. Therefore it is not surprising that especially from 2007 onwards the local media discourse emphasises political action like conferences and programmes with focus on Lübeck as a centre of power in the Baltic Sea region to face climate change. The local topic of being a historically powerful town also influences the preferred coping strategies: there is a strong belief that mitigation as well as in the recent past also adaptation measures are able to preserve the town in the long term.

Potential problems may arise when new knowledge does not fit to the local narrative- knowledge might not be integrated and therefore measures that could be important to cope with climate change might not be taken.

Rostock
How constructions of the future interrelate with perceptions of climate change

In Rostock media climate change is similarly to Lübeck mainly perceived as a global threat. Beyond that, a characteristic of the Rostock media discourse is that other than in Lübeck not the town is in focus of attention of potential impacts but the coastal region. The positive impacts of a warmer climate are emphasised, potential threats remain in the background of the media climate change discourse. Current local problems occurring during summer heat waves are not discursively linked with the topic of climate change.

When talking about climate change the focus of attention lies mainly on the future. A future that promises a better economic situation: Rostock should take the chances of a changing climate, especially in the regional tourist industry as well as on the renewable energy market.

Unsurprisingly the position of economic players in Rostocks local media discourse on climate change is strong. Unlike Lübeck where administration and politics generate their own topics dealing with climate change, these fields in the Rostock media discourse mainly just affirm Rostock's 'economic project'. Long term mitigation strategies are preferred and serve as a chance to solve current local problems, for example unemployment.

There is a risk that natural scientific knowledge is interpreted in a rather one-sided way as a potential chance for the region- it will be difficult to gain attention for new interpretations as there seems to be a strong consensus among the fields of politics, administration and economy to support the 'economic project'.

Discursive constellations- How do distinctive local ways of dealing with and perceiving climate change occur?

Even though the uncertainty of the impacts of climate change dominate the local discourses, the discursive constellations in both research towns also show a deep belief in their safeness. For different reasons there is a faith, expressed in the media, that it is feasible to cope with climate change. Such beliefs influence climate adaptation governance and might turn into barriers for effective measures.

To find out how the distinctive ways of dealing with and perceiving climate change in a town works certain factors need to be taken into account: Of course the local perception of climate change is influenced by the way climate change is perceived on a national or supra-national level. But which aspects of the supra-national discourse are taken over by the local level depends on local factors as well. Local knowledge or culture, influences the occurrence of certain discursive topics in some places while it can suppress them in others. Local narratives and topics that result from historical heritage, tradition and what has happened in a city can have an effect on how, for example, climate change is perceived in an area. In Lübeck the belief in the town's safety seems to be derived from a long tradition of belief in the town's mightiness and political influence, whereas in Rostock the concentration on the future, leaving the past behind, lead to these views.

For the German national level Weingart et al. showed that different societal fields like economy, politics and administration create their own ways of communicating about climate change- their own discourses. All these field's discourses are reflected in the media- a field with specific logics itself (ib. 2003). We suppose that Weingart et al.'s concept is also applicable for the local level. In different cities the perception of climate change follows the discursive logic of different societal fields. While the discursive logics within the fields seem to be relatively stable and similar, the local discursive constellations of and between the sectors vary. The local constellations of societal fields depend on their discursive power and influences the local way of dealing with climate change. In Lübeck the perception of climate change seems to be strongly influenced by local administrative and political agents. In Rostock besides administration and politics, economic players mainly seem to set the perception of climate change.

5   Conclusion: The Role of Culture for Adaptation in European Coastal Areas

The differing perceptions of agents and societal fields concerning climate change can hinder coordinative action like governance on climate adaptation. Even if the perceptions on threats are similar, the preferred coping measures can still differ. In this paper, we showed how individual and supra-indvidual knowledge constructions on climate change develop and which factors can influence them.

Taking the example of two cities we illustrated how discourses show the unique local ways of dealing with climate change. We furthermore described how culturally formed knowledge constructions like values interrelate with the individual perception of climate change threats. It seems obvious that differences in the interpretative framework of agents can cause conflicts between local agents. We suppose, that cultural differences need to be taken into account to increase the efficiency and adequacy of climate adaptation measures.

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