

**Reply to RC C200: 'Comments on "Assessing institutional capacities to adapt to climate change – Integrating psychological dimensions in the ACW"', Anonymous Referee #2, 13 May 2013**

**General comment by Anonymous Referee #2 :** “My main comments and concern are that the two parts of the paper are not linked clearly enough and that therefore the results do not support the conceptual part of the paper clearly enough. So my general suggestion is to assure that (1) the connections between the conceptual and the empirical part of the paper become more explicitly and (2) to assure that the discussion section refers to both the empirical implementation and the conceptual development part of the paper.”

**Reply by authors:** These are very helpful recommendations. In a revised version of the paper (1) the connections between the conceptual and the empirical part of the paper will be described more explicitly by including more details how the interviews and document analyses operationalized the different dimensions of the ACW and (2) the discussion section will refer to both the empirical implementation and the conceptual development part of the paper.

**Comment 1 by Anonymous Referee #2 :** “The discussion of existing frameworks and the synopsis in table 1 is of particular value, not only in the context of this special issue. Do you see a chance to refer to it later on again, for example in the discussion, so that the strong conceptual part of the work in the paper gets more weight in the discussion?”

**Reply by authors:** As has been noted in the reply before, in a revised version of the paper the discussion section will refer to both the empirical implementation and the conceptual development part of the paper. In the revised discussion section we will also link back to table 1 again.

**Comment 2 by Anonymous Referee #2 :** The 4<sup>th</sup> chapter (application) is a little bit hard to understand without being an expert in using the ACW and when neither the original paper of Gupta et al. (2010) nor the four studies for the sectors are at hand or, in the case of the studies, could not be accessed via Internet. Additionally, the empirical implementation is presented rather briefly. Suggestions:

- a) adding basic information on the research protocol of the ACW in the beginning of the section so that the steps of the data collection and analysis can be understood (see also below).
- b) adding a figure in subsection 4.2 showing one example of the studies mentioned as a ACW with traffic light system, or as a combination of the traffic light system and of the process of scoring / rating as described in the section data analysis in section 4.2
- c) being precise in terminology when describing the procedures of scoring and rating the original dimensions and the newly added dimensions. Throughout the section 4 it was not always clear if “rating” was referring to assigning weights by the “raters” or if “rating” referred to scores or aggregates scores on rating scales.

**Reply by authors:** All suggestions can easily be addressed. In a revised version of the paper we will

- add basic information on the research protocol of the ACW in the beginning of the section so that the steps of the data collection and analysis can be understood,
- add a figure in subsection 4.2 showing one sectoral example of a ACW with traffic light system,
- be more precise in terminology when describing the procedures of scoring and rating the original dimensions and the newly added dimensions in order to avoid a potential confusion of “rating” referring to assigning weights by the “raters” and “rating” referring to scores or aggregates scores on rating scales.

**Comment 3 by Anonymous Referee #2 :** According to section 3, adaptation motivation is mainly based on risk perception in a broad sense, and has been translated / operationalized in the interviews into “relevance of climate change in the organization”. This was surprising to me. Therefore my question is: how do the conceptual thoughts on adaptation motivation translate into the question of “relevance” in the interviews in the four studies?

**Reply by authors:** The operationalization of adaptation motivation via only one interview question on the relevance of adaptation is already problematized in the discussion of the paper: “it seems advisable to assess adaptation motivation based on more than just one indicator (in this study: perception of current relevance of adaptation to climate change in organisation). Including also questions to assess the perceptions of future relevance of adaptation and questions from classical risk perception surveys would minimize the danger of false positive (assessment of adaptation motivation as high) or false negative (assessments of motivation as low) ratings” (see pages 815/6).

To explain why we have used “relevance of adaptation to climate change in the organization” as the indicator of adaptation motivation instead of “perceived risk” we will include the following paragraph in section 4.1.1 of the revised version of our paper:

*It has been argued in section 3 that the main determinant of adaptation motivation is the perception of risks (or: risk appraisal) and/or chances of climate change and its potential impacts. Nevertheless, we assessed adaptation motivation in this study via the perceived relevance of adaptation to climate change in the organisations of the interviewees. Most of the interviewees represented organisations in which adaptation to climate change has not yet or not deeply been discussed (especially not a top levels of organisations). We knew from previous studies (e.g. Zebisch et al., 2005) that a question asking for perceptions of risks in the organisations would have resulted in many “don’t know” answers because organisational representatives do not want to make statements about risks, when there is a lack of formalised organisational risk assessments and organisational discourse on climate change risks has just started. Therefore, we decided to measure adaptation motivation by a question asking for the perceived relevance of adaptation in the organisations. This was a question which the interviewees were willing to answer. Certainly, perceived relevance of adaptation and adaptation motivation are not identical but if an issue is regarded as relevant in an organisation there is a high probability that there is also an ‘organisational motivation’ to deal with this issue.*

*[New reference: Zebisch, M., Grothmann, T., Schröter, D., Haße, C., Fritsch, U., Cramer, W. (2005). Climate change in Germany. Vulnerability and adaptation of climate sensitive sectors. Report 201 41 253. Dessau: Federal Environmental Agency Germany.]*

(see also Reply by authors to Comment 2 by Anonymous Referee #3)

**Comment 4 by Anonymous Referee #2 :** In the first part of the paper, “institutions” in the context of institutional capacities are defined in a broad social science sense as systems of rules and procedures, stressing the point that “institutions” is going beyond the sense of being a synonym for organizations (p. 798, line 18-20). However, from the empirical studies presented, the assessed “institutional capacities” seem to refer to organizations or to sectors as an aggregation of institutions / organizations. Therefore my question is: how has the broad definition of “institutions” been applied in the empirical studies? And if the study focuses on institutions only in the sense of “organizations” of a number of sectors, what would be an example for a relevant institution beyond the understanding as “organizations”?

**Reply by authors:** Although institutions are systems of rules and procedures and not identical with organisations, for some sectors – including those presented in the empirical part of this paper – many of the existing rules and procedures are formalised within organisational settings or the organisations follow rules (e.g. laws) set by other organisations/social systems (e.g. parliaments) . The institutions (rules and procedures) for the sectors studied here – water management, flood/coastal protection, civil protection and spatial/regional planning – are highly formalised in Germany within governmental organisational settings. Hence, we primarily interviewed representatives from governmental organisations and primarily analysed documents from governmental organisations. For other ‘sectors’ in Germany (e.g. nature conservation) institutions exist much more outside organisational settings (e.g. in groups of loosely coordinated people engaging for nature conservation) but for the sectors studied here, it made sense to focus on governmental organisations in order to gain an understanding of the existing rules and procedures.

**Comment 5 by Anonymous Referee #2 :** The discussion section of the paper focuses more on the results of the empirical implementation than on the conceptual part of the paper, thus this section would gain from trying to serve as a bridge between the conceptual and the empirical part of the paper. As a result of the very brief presentation of results, the discussion refers to a certain extent to methodological issues that are not shown in the paper itself, such as the “traffic lights” and the aggregation methods from single results to a value of the dimension of the ACW. In order to make the discussion be supported by the results, it would be helpful to include a figure showing a result from one of the mentioned publications that is appropriate to support the discussion of the newly added dimensions and their assessment (see also one of the comments above).

**Reply by authors:** As has been noted before, in a revised version of the paper the discussion section will refer to both the empirical implementation and the conceptual development part of the paper and therefore serve as a bridge between the conceptual and the empirical part of the paper. As has also been noted in reply to comment 2, in the revised version of the paper we will add a figure in the results section 4.2 showing one sectoral example of an ACW with traffic light system.

**Comment 6 by Anonymous Referee #2 :** Page 800, the six dimensions of challenges to climate change adaptation referring to Prutsch et al. 2013 (not yet published): The authors define these six dimensions

as the main challenges of adaptation to climate change, and from the wording in the paper (“we differentiate six main challenges”), it seems to be an important framework for the authors. However, if this enumeration of challenges is “just” one of the possible frameworks for dimensions of adaptive capacity (such as the concept of Smit and Pilisofa or the typology by Kuhlicke et al.) and of lesser relevance for the following texts as for example the ACW, could then the rather extensive explanation of this framework be shortened as it might distract from the (extended) ACW as the main concept at focus in this paper, especially if there is no follow-up of the dimensions proposed by Prutsch et al., Kuhlicke et al., and Smit and Pilisofa in the discussion section of the paper?

**Reply by authors:** The list of challenges proposed by Prutsch et al. is not “just” one of the possible frameworks for dimensions of adaptive capacity but a list of challenges that frameworks for dimensions of adaptive capacity should address. Hence, Prutsch et al. serve here as a list of targets a concept of adaptive capacity has to achieve. Adaptive capacity frameworks should include elements or dimensions that provide solutions for these challenges. Therefore, the list by Prutsch et al. can be used to check adaptive capacity frameworks, whether they provide answers to/solutions for the specific challenges of adaptation to climate change. One of the reasons, why we have chosen the Adaptive Capacity Wheel (ACW) by Gupta et al. as our frameworks for assessing adaptive capacity, was that the ACW explicitly or implicitly addresses all of the challenges named by Prutsch et al. Because the list of Prutsch et al. was an important reason for choosing the framework by Gupta et al. and is only understandable if described in detail we would like to retain the extensive explanation of the list by Prutsch et al. on page 800. To avoid the misunderstanding of the list by Prutsch et al. as a framework for assessing adaptive capacity we will include the following short paragraph in the revised version of the paper:

*The list of adaptation challenges proposed by Prutsch et al. can be used as a checklist for adaptive capacity frameworks. These frameworks should include elements or dimensions that provide solutions for these challenges. One of the reasons, why we have chosen the Adaptive Capacity Wheel (ACW) by Gupta et al. as our frameworks for assessing adaptive capacity, was that the ACW explicitly or implicitly addresses all of the challenges named by Prutsch et al. (see Table 1).*

**Comment 7 by Anonymous Referee #2 :** Page 803, line 7 to page 804, line 8 describe the dimension “adaptation motivation” and refer to risk perception as main determinant for this dimension whereby risk perception is defined in a broad sense. In order to connect this delineation and explanation to the empirical part of the paper, it would be good to mention “relevance of climate change” in this context or, later on, for example on page 805 (lines 9 to 15 that put the dimensions in the context of institutional decision-making).

**Reply by authors:** As has been noted in reply to comment 3 we will include a paragraph in section 4.1.1 of the revised version of our paper to explain why we have used “relevance of adaptation to climate change in the organization” as the indicator of adaptation motivation instead of “perceived risk”. Furthermore, following comment 7, we will also include a short footnote in section 3 to mention the assessment of adaptation motivation by the perceived relevance in our empirical studies:

*Footnote: In our empirical studies (see section 4) we assessed adaptation motivation via interviewees’*

*perceptions of relevance of adaptation to climate change. The reasons for this assessment procedure are explained in detail in section 4.1.1.*

**Comment 8 by Anonymous Referee #2 :** Page 807, “part of the project was an analysis of capacities to adapt..”: -> do you mean institutional capacities?

**Reply by authors:** Yes. We will change the sentence as follows:

*Part of the project was an analysis of institutional capacities to adapt to potential climate change impacts*

**Comment 9 by Anonymous Referee #2 :** Page 807, line 14/15: you briefly mention that you follow the research protocol of the ACW – to make the following presentation of your results easier and better to understand without having the paper of Gupta et al. 2010 at hand, it would be helpful to mention key issues of the research protocol that you applied (such as (a) qualitative methods of data collection, (b) “quantitative” scores for the indicators/ criteria, and (c) ratings or weights assigned to the dimensions by different researchers.

**Reply by authors:** As has been noted in reply to comment 2 we will add basic information on the research protocol of the ACW in the beginning of this section in the revised version of the paper so that the steps of the data collection and analysis can be understood.

**Comment 10 by Anonymous Referee #2 :** Page 809, first line: “adaptation motivation was assessed by “relevance of adaptation”: how does “relevance” correspond to the conceptual delineation of adaptation motivation with focus on risk perception (section 3?) Just one question / criterion compared to adaptation belief?

**Reply by authors:** Please see reply to comment 3.

**Comment 11 by Anonymous Referee #2 :** Page 810, line 16 “... were reviewed by another rater and discussed, if raters disagreed...”: from the text it is not clear who this raters were: researchers in the same project group or from other projects / groups, or experts from the field? Please specify.

**Reply by authors:** The different raters were all members of the project team. In the revised version of the paper we specify this as follows:

*The different raters were all members of the project team. For example, the assessments by the rater, who primarily analysed the interview data and documents for the spatial/regional planning sector, was reviewed by the rater, who primarily analysed the data for civil protection.*

**Comment 12 by Anonymous Referee #2** : Page 811, first line: "...to gain values for the six dimensions". Do you mean the six dimensions of the original ACW? If so, please mention it.

**Reply by authors:** Yes, we will specify as follows:

*... to gain values for the six dimensions of the the original ACW*

**Comment 13 by Anonymous Referee #2** : Page 811, line 12: "... the overall sectorial capacities (...) were rated... ": -> rated by whom? A couple of lines above "rated" is used in context of the assessments on the 4-point scale in the interviews. Is this also the case in context in line 12 or does it refer to rating of researchers in assigning weights to the dimensions / criteria when "calculating" the mean score value of a dimension? It is not always clear in this paragraph if "rating" refers to a collected value in the interview, an aggregation using a formal mathematical procedure, or a assigning of weights by researchers in an argument-driven process.

**Reply by authors:** Here, "rated" is referring to a result of a primarily mathematical procedure but the raters (basically the researchers who did the analyses of the data) could deviate from this this procedure and give specific criteria a higher weight, if the criteria were regarded as particularly important for the adaptive capacity of a sector.

In a revised version of the paper we will try to be more precise regarding the different usages of the word "rate" and specify what it is referring to (a rating of interview data, a rating generated by using a formal mathematical procedure, or a rating generated in an argument-driven process).

**Comment 14 by Anonymous Referee #2** : References List: The key resources to trace back and take a closer look at the results presented in the section 4 (Garrelts 2012a and 2012b, Grecksch 2012, Wings 2012) is this one: Vulnerabilität und Klimaanpassung: Herausforderungen adaptiver Governance im Nordwesten Deutschlands, nordwest2050-Werkstattbericht Nr. 19, edited by: Garrelts, H., Grothmann, T., Grecksch, K., Wings, M., Siebenhuner, B., and Flitner, M., University Bremen und Carl von Ossietzky University at Oldenburg, Germany, 2012 (in German). This resource "Werkstattbericht Nr. 19" is not listed on the nordwest 2050 webpage (<http://www.nordwest2050.de>), "Werkstattbericht Nr. 19" has another topic. -> Please check, and, if possible, provide URL.

**Reply by authors:** Unfortunately, although promised for the end of 2012 one of the authors of this publication still has not yet handed in his final version. Therefore, the reference for this publication has to be these changed to "under preparation".