Stakeholder Participation in Adaptation to Climate Change – Lessons and Experience from Germany

Umwelt Bundes Amt
Für Mensch und Umwelt

| CLIMATE CHANGE | 12/2013

ENVIRONMENTAL RESEARCH OF THE GERMAN
FEDERAL MINISTRY OF THE ENVIRONMENT,
NATURE CONSERVATION AND NUCLEAR SAFETY

Project-no. (FKZ) 3711 41 105

Stakeholder Participation in Adaptation to Climate Change – Lessons and Experience from Germany

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UMWELTBUNDESAMT

This publication is only available online. It can be downloaded from
http://www.uba.de/uba-info-medien-e/4558.html .

The contents of this publication do not necessarily
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ISSN 1862-4359

Study performed by: Institute for Ecological Economy Research (IÖW)
Potsdamer Str. 105
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Study completed in: August 2012

Publisher: Federal Environment Agency (Umweltbundesamt)
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Edited by: Section I 1.7 KomPass – Klimafolgen und Anpassung in Deutschland
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Dessau-Roßlau, July 2013

Abstract

Openness and cooperation is one major principle of the German Adaptation Strategy; the development and implementation of adaptation policies is hence accompanied by broad and diversified stakeholder participation processes. Mainly three German ministries have initiated and supported stakeholder participation: the Federal Ministry for the Environment that has the lead in developing adaptation policies, the Federal Ministry for Education and Research through funding two research programs on adaptation, and the Federal Ministry of Transport, Building and Urban Development through funding regional model projects. A review of these stakeholder integration processes shows that different degrees of participation were realised (communication, consultation, co-production and co-decision) and that both science-based and policy-based approaches were pursued. While science-based approaches aim at improving research results, policy-based approaches target at influencing political decision-making. A broad variety of actors have been involved and almost all 15 sectors mentioned in the German Adaptation Strategy have been covered. While topics such as agriculture or water have been broadly addressed, economic issues have been touched only by a minority of events. Researchers and representatives from administration have participated in almost all events whereas policy-makers, companies and civil society organizations were less represented. The report concludes with recommendations for planning and conducting stakeholder participation processes and suggests suitable designs depending on the pursued objectives.

Kurzbeschreibung

Offenheit und Kooperation sind zentrale Grundsätze der Deutschen Anpassungsstrategie, weshalb die Entwicklung und Umsetzung von Anpassungspolitik durch einen intensiven Prozess der Stakeholderpartizipation begleitet wird. Insbesondere drei Bundesministerien haben diesen Partizipationsprozess gestaltet: das Umweltministerium, das die Federführung für das Thema Anpassung innehat, das Forschungsministerium durch die Förderung zweier Forschungsprogramme zu Anpassung und das Bau- und Verkehrsministerium durch die Unterstützung von Modellprojekten. Eine Analyse dieser Beteiligungsprozesse zeigt, dass unterschiedliche Grade der Beteiligung erreicht wurden (Kommunikation, Konsultation, Co-Produktion und Mitentscheidung) und dass sowohl wissenschaftsorientierte als auch politikorientierte Ansätze verfolgt wurden. Eine große Akteursvielfalt wurde in den Prozess eingebunden und fast alle 15 in der Deutschen Anpassungsstrategie benannten Sektoren und Bereiche adressiert. Während Themen wie Landwirtschaft oder Wasser in vielen Veranstaltungen behandelt wurden, waren ökonomische Themen eher selten. Vertreter/innen aus Wissenschaft und Verwaltung waren in fast alle Veranstaltungen involviert; Politiker, Unternehmen und zivilgesellschaftliche Organisationen waren demgegenüber deutlich geringer repräsentiert. Der Bericht gibt Empfehlungen zur Gestaltung von partizipativen Prozessen und schlägt in Abhängigkeit von den verfolgten Zielen geeignete Ansätze und Methoden vor.

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Abbreviations

APA	Aktionsplan Anpassung (Adaptation Action Plan)
BMBF	Bundesministerium für Bildung und Forschung (Federal Ministry for Education and Research)
BBSR	Bundesinstitut für Bau-, Stadt- und Raumforschung (Federal Institut for Research on Building, Urban Affairs and Spatial Development)
BMU	Bundesministerium für Umwelt, Naturschutz und Reaktorsicherheit (German Federal Ministry for the Environment)
BMVBS	Bundesministerium für Verkehr, Bau und Stadtentwicklung (Federal Ministry of Transport, Building and Urban Development)
DAS	Deutsche Anpassungsstrategie (German Strategy for Adaptation to Climate Change)
KlimaExWoSt	Urbane Strategien zum Klimawandel (Urban strategies and potentials to combat climate change)
KlimaMoro	Raumentwicklungsstrategien zum Klimawandel (Spatial Development Strategies for Climate Change)
KLIMAZWEI	Klimaschutz und Anpassung (Climate protection and adaptation)
KLIMZUG	Klimawandel in Regionen (Climate Change in Regions)
KLIWAS	Auswirkungen des Klimawandels auf Wasserstraßen und Schifffahrt – Entwicklung von Anpassungsoptionen (Impacts of climate change on waterways and navigation – Searching for options of adaptation)
KomPass	Kompetenzzentrum Klimafolgen und Anpassung (Competence Centre on Climate Impacts and Adaptation)
NGO	Non-Governmental-Organization
UBA	Umweltbundesamt (Federal Environment Agency)
UN	United Nations

Introduction

1.1 German Strategy for Adaptation to Climate Change – Processes and Central Actors

First attempts to analyze and discuss the options to adapt to the effects of climate change date back to the UN Framework Convention on Climate Change (1992). It took more than a decade until the discussion intensified in Germany. German climate policy started with approaches to reduce greenhouse gas emissions. Mitigation was seen as the most urgent problem to be addressed – more urgent than adaptation policies that were suspected to accept climate change as given and thereby weakening the efforts to prevent further deterioration. The IPCC report, several disastrous flood and storm events in Germany and neighbouring countries, accompanied by reports on increasing damage costs published by the insurance industry and the European Environmental Agency's reports on the impacts of Europe's changing climate (2004, 2008), pushed adaptation challenges higher on the political agenda.

The national policy process for adaptation to climate change started in 2005 with the integration of adaptation aspects into the national climate protection program (Bundesregierung 2005, see also Stecker et al. 2012). The process to bring adaptation challenges into the focus was initiated and fuelled mainly by the German Federal Ministry for the Environment (BMU), which later coordinated the process generating the German Adaptation Strategy (DAS) (The Federal Government 2008) and the German Adaptation Action Plan (APA) (German Federal Cabinet 2011). Together with its subordinated authority, the Federal Environment Agency (UBA), BMU brought together hundreds of experts from science, governmental institutions and industry in a series of national workshops and conferences starting in 2005 (see chapter 2.1). These initial conferences were followed by a series of stakeholder dialogues that were focused on sectors and cross-cutting themes addressed in the German Adaptation Strategy (Hoffmann et al. 2011).

The results of this consultation and participation processes were taken into account in the formulation of the national adaptation strategy that has been coordinated by the Federal Ministry for the Environment and developed in cooperation with an Inter-ministerial Working Group of Federal Ministries and the Conference of Federal and State Ministers for the Environment[1]. The German Adaptation Strategy, adopted by the Federal Cabinet in 2008, focuses on climate change challenges and adaptation options for the following 15 sectors and areas (the order of appearance does not imply a ranking):

- Human health,
- Building sector,
- Water regime, water management, coastal and marine protection,
- Soil,

[1] The Conference of Federal and State Ministers for the Environment is the coordination body of regional ("Bundesländer") and national environment ministers and senators, meeting twice a year to discuss current topics in environmental policy. In 2009 the Permanent Committee on Adaptation to the Consequences of Climate Change (Ständiger Ausschuss "Anpassung an die Folgen des Klimawandels" – AFK) was established.

- Biological diversity,
- Agriculture,
- Forestry and forest management,
- Fishery,
- Energy industry (conversion, transport and supply),
- Financial services industry,
- Transport and transport infrastructure,
- Trade and industry,
- Tourism industry,
- Cross-sectional topics: Spatial, regional and physical development, planning and civil protection.

The German Adaptation Strategy is described as "a medium-term process which will progressively ascertain action needs and develop and implement adaptation measures in conjunction with the relevant stakeholders" (The Federal Government 2008, 6). Openness and cooperation is hence one major principle of the Adaptation Strategy. Adaptation to climate change is termed a major societal challenge that can only be tackled by including all relevant stakeholders. Climate change has impacts on all parts of society and these impacts strongly vary across regions. The responsibility for adaptation and options for action are hence largely distributed – among different political levels and between different parts of society – and successful adaptation needs coordination and communication among diverse actors. The German approach to climate adaptation is based on mainstreaming: adaptation as a new political challenge is integrated in existing political structures, aims at inter-sectoral and inter-level cooperation between different ministries and at integrating a wider public (see Stecker et al. 2012). The Federal Ministry of the Environment takes the lead in the adaptation process, but many adaptation measures have to be implemented on a local level by a variety of political, administrative, or economic actors. Stakeholder dialogue and communication are thus important building blocks in advancing the German adaptation process.

After screening possible effects and challenges that climate change poses to relevant sectors and areas the next step was to identify options for action and to draw together the institutions and actors that are able to take initiative towards adaptation. The Adaptation Action Plan (Aktionsplan Anpassung, APA published in August 2011) defines principles and criteria for identifying and prioritizing action needs. It gives an overview on exemplary measures, provides information on financing, and specifies next steps in the further development of the German Adaptation Strategy.

Operated by its Environment Agency (UBA), the Federal Ministry for the Environment in 2006 established a Competence Centre on Climate Impacts and Adaptation (KomPass) that has been designed to draw together knowledge on the effects of climate change and to collect best practice examples for adaptation options. Complementary knowledge platforms were funded by national and regional budgets, among them the Climate Service Centre, the Climate Atlas for Northern Germany, regional Climate Bureaus, project-based information platforms (e.g. KLIMZUG projects). Universities and other research institutions already working on different

aspects of climate change contributed to the national research conferences and provided expertise in the formulation of the adaptation strategy – among them the Potsdam Institute for Climate Impact Research that was founded in 1992 and is playing an active role in the Intergovernmental Panel on Climate Change (IPCC).

Approaches for integrating research, stakeholder and political perspectives were initiated not only by the Federal Ministry for Environment and its Environment Agency (UBA), but were funded and supported by the Federal Ministry for Education and Research (BMBF), the Federal Ministry for Transport, Building and Urban Development, the Federal Ministry of Economics and Technology, the Federal/Länder Standing Committee "Adaptation to the Consequences of Climate Change", Länder Ministries responsible for Adaptation (mostly Ministries for Environment or Economics) and regional planning authorities.

Stakeholder participation in the development of adaptation policies may induce various benefits (Gardner et al. 2009): Participatory processes can serve as platforms for problem-oriented knowledge generation and transfer (Hoffmann et al. 2007). They can facilitate a deeper understanding of challenges, potential solutions and alternative perspectives (Gardner et al. 2009). Involving various individuals or groups may moreover increase the quality of decisions and decision-making as well as the acceptability of and the commitment to developed solutions (see Forrester 1999, Fiorino 1999, Webler & Renn 1995). Especially with complex issues such as sustainability or climate change, participation in stakeholder processes can animate participants to reflect on their own behavior and can contribute to changes in attitudes and behaviour (Hoffmann et al. 2010). Participation may moreover strengthen stakeholders' resources by increasing awareness, trust, skills and cooperation (Gardner et al. 2009).

1.2 Methods and Structure

The aim of this report is to give a systematized overview of stakeholder participation approaches addressing adaptation issues in Germany.

Within this report, we apply a broad definition of the term participation, and use the terms participation, involvement and engagement synonymously. They all refer to "a process by which individuals and groups come together in some way to communicate, interact, exchange information, provide input around a particular set of issues, problems or decisions, and share in decision-making to one degree or another" (Ashford et al. 1999). Regarding the actors in participation processes, there are two perspectives: on the one hand the stakeholder, on the other the actor who initiates a participative approach. Rowe and Frewer refer to the latter as "sponsor" (2005), in the following we will use the term "initiator".

We concentrate on activities and projects initiated or funded by the federal level because adaptation policy is coordinated by the federal level and this level is the main field of action in the German Adaptation Strategy. Stakeholder involvement within the regional or local level is included only as far as those local or regional activities are involved in projects funded or initiated by federal ministries. The main initiators of participation-related processes and projects on the federal level are three ministries (BMU, BMBF, and BMVBS, see below) and their subordinated authorities. The report is therefore structured in chapters, which outline their diverse activities.

These institutions are

- The *Federal Ministry for the Environment* (Bundesministerium für Umwelt, Naturschutz und Reaktorsicherheit: BMU) with the *Federal Environment Agency* (Umweltbundesamt: UBA) and its Competence Centre on Climate Impacts and Adaptation (Kompetenzzentrum Klimafolgen und Anpassung: KomPass),
- The *Federal Ministry of Education and Research* (Bundesministerium für Bildung und Forschung: BMBF) and
- The *Federal Ministry of Transport, Building and Urban Development* (Bundesministerium für Verkehr, Bau und Stadtentwicklung: BMVBS) with the *Federal Institut for Research on Building, Urban Affairs and Spatial Development* (Bundesinstitut für Bau-, Stadt- und Raumforschung: BBSR).

Although all federal ministries are engaged in the development of adaptation policies within the inter-ministerial working group, the degree of engagement differs greatly and other departments did not initiate comprehensive stakeholder participation. For the sake of completeness, a series of small stakeholder workshops initiated by the Federal Ministry of Economics and Technology should be mentioned, discussing stakeholder's perspectives in the sectors energy, industry, SMEs, and Tourism. This single participation initiative will not be taken into account within this report.

For analytical as well as pragmatic reasons our main focus is on processes and programs already completed. Firstly, we want to reflect outcome and experience and analyze follow-up implications of the respective participation approach. Secondly, data such as final reports are available only for projects already completed. The present report is mainly based on document analysis. Partly, especially within the BMBF-funded activities (KLIMAZWEI) and some BMU/UBA activities, reflections on outcomes and experience were drawn from interviews with involved project managers. As the authors themselves were assigned contractors for the realization of BMU/UBA stakeholder dialogues, own experience has contributed to this report.

The description and analysis within the particular chapters are structured by focusing on the following aspects:

- Objectives and institutional setting of participation events,
- Adaptation problems addressed,
- Actor and stakeholder groups involved,
- Degree of participation as well as the dialogue designs within the respective activities,
- Relevant outcomes and experience of the participation processes,
- Potential follow-up activities.

Hereafter, the underlying assumptions and categories for these aspects are briefly elaborated:

a) Objectives of stakeholder involvement and institutional setting

Analyzing objectives, one can distinguish two types of participatory approaches pursuing basically different goals: policy approaches and science-based approaches (Welp et al. 2006).

Policy-based approaches aim at stakeholder integration to support the development of policies, to create support and acceptance for developed policies and to successfully implement those (Welp et al. 2006). To develop, form and concretize policies, policy makers aim at an information exchange with stakeholders to acquire practical, contextual and local knowledge. To create support and acceptance, policy makers aim at sensitizing stakeholders. Sensitization in the context of adaptation to climate change means to raise and increase awareness among central stakeholders in economy, policy and administration for climate change and adaptation needs. Through stakeholder integration, policy makers may refine guidelines of decided policies, hence supporting their further implementation.

Science-based approaches rather seek to deepen the understanding of a specific problem by integrating and combining stakeholders' knowledge bases. Moreover, scientists need a "reality check" (Welp et al. 2006) for their research. This check can be provided by stakeholders integrated into the research process who evaluate methodology or final results with regard to their needs. By integrating stakeholders into the research process scientists can survey stakeholders' needs and identify socially relevant research questions.

In practice, both approaches may get mixed within a participation process.

The respective institutional setting is described referring to actors involved in planning, management, and evaluation of the participation processes. It further reflects the identification, selection and invitation of stakeholders.

b) Central adaptation problems addressed

This section points to the central adaptation problems that have been dealt with in the course of a participation project or activity. Description either refers to the climate impacts and stimuli, such as droughts or floods; or to the spheres of activities in adaptation needs. Concerning the latter, we orient ourselves at the 15 spheres of activity noted in the German Adaptation Strategy (see 1.1).

c) Stakeholders involved

Within this report we define stakeholders as "those who have interests in a particular decision, either as individuals or as representatives of a group. This includes people who influence a decision, or could influence it, as well as those affected by it" (Hemmati 2002). In this section we explore which stakeholders were involved in the participation process. On that purpose we differentiate between the following stakeholder groups:

- Science,
- Politics,
- Administration,
- Companies,
- Commercial associations,
- Civil Society represented by non-governmental organizations (NGOs, e.g. environmental NGOs) and other organizations (e.g. unions),
- Interested public and individuals,

- Media and journalists.

d) Dialogue design and degree of participation

Literature provides a tremendous amount of methods and possible designs of participation processes, amongst others: referendum, public hearing, public opinion survey, negotiated rule making, consensus conference, citizens' jury/panel, public advisory committee, focus groups. Rowe and Frewer (2005) compiled more than 100 types of dialogue designs. Conde and Lonsdale (2005) subdivide types of designs with respect to special parts of the dialogue (like beginning and discussion) and aims of the process (scope issues, identify gaps).

Several scholars have defined criteria to measure the degree of participation. They differ in structure and with respect to the criterion with which they measure the degree of participation. A seminal work is Arnstein´s latter of participation from 1969 (Arnstein 1969) which can be found in a multitude of variations (see e.g. Pretty 1994; Conde & Lonsdale 2005; Duraiappah et al. 2005). Arnstein's latter is a hierarchical approach and, like Arnstein herself wrote, based on an understanding of participation as a "categorical term for power" (Arnstein 1969). On the other hand there are authors who suggest a non-hierarchical classification of the degree of participation and who do not presume a power-based understanding of participation (see Collins & Ison 2009).

We chose a mix of both types and distinguish degrees of participation according to the intensity of involvement and the decisional power given to stakeholders. We understand this differentiation in an analytical but not in a normative way. Different degrees of participation might be efficient and appropriate, depending on the initiator's objectives.

We understand the degree of participation as the degree to which information or decisions, given and made by stakeholders, affect the process of policy making or research design or results. Hage and colleagues (Hage & Leroy 2008; Hage et al. 2010a) differ between interactive and non-interactive participation. Within these two categories they differentiate between eight cases of aspired levels of participation. Concerning interactive approaches these are "consult", "take advice", "co-produce" and "co-decide". Concerning non-interactive approaches these are "non-participate", "inform", "study" and "listen". As we aim to analyze participatory approaches we will not consider the degree "non-participate". To reduce complexity we will moreover integrate the three remaining non-interactive types of participation into one degree called "stakeholder communication". Drawing on Green and Hunton-Clarke (2003), Hage and colleagues (Hage & Leroy 2008; Hage et al. 2010a) as well as on Rowe and Frewer (2005), we differentiate in total four degrees of participation:

- Stakeholder Communication: At this level information is passed from one actor to another. There is a one-way flow of information, either from initiator to stakeholder, which we here refer to as sensitization, or the other way round.
- Stakeholder Consultation: From this level onwards we come across a two-way flow of information between the stakeholders and the initiator. At this respective level the stakeholders are asked for their opinions and views on proposals at various stages of the policy or research process. The initiators listen and comment. However, they are free to take the stakeholder's advices into account or not.
- Stakeholder Co-Production: At this level, stakeholders are integrated into processes of knowledge production. These are organized through an alternation of research and

participation in a research-led participation process. This may for example be an interactive scenario development.

- **Stakeholder Co-Decision:** At this level, stakeholders are integrated into the decision-making process, for example in actual political decision making or in the preparation of political decisions. This level also includes an interactive participation described by Pretty (1994), where stakeholder and initiator are involved in a joint analysis and joint action planning. Hage and Leroy (2008) note that this degree is not very common in practice.

e) Outcomes and experience

In this section we sum up central outcomes and experiences concerning challenges and important insights form the implemented participation processes.

f) Follow-up processes

A central goal formulated in the German Adaptation Strategy and Action Plan is the support and enforcement of self-governed activities of public and private actors on all levels in the different spheres of adaptation. An implicit aim of participation activities is therefore to stimulate network building and awareness rising within society so the participants of stakeholder involvement activities carry on with autonomous knowledge, strategy, and action development. We therefore reflect the follow-up processes that did or did not emerge out of the various activities initiated by the federal ministries.

2 Dialogue Processes on Adaptation Options in Germany and Initiating Institutions

2.1 Federal Ministry for the Environment (BMU) / Federal Environment Agency (UBA)

In this section, we review the participative approaches initiated by the Federal Ministry for the Environment (Bundesumweltministerium: BMU) and its subordinate agency the Federal Environment Agency (Umweltbundesamt: UBA).

The national policy process for adaptation to climate change started in 2005 with the integration of adaptation aspects into the national climate protection program (Bundesregierung 2005, see also Stecker et al. 2012). The aim to involve various and diverse actors and experts in the development of a national adaptation approach was formulated ever since. Moreover, both the DAS and the APA explicitly include the objective to start a dialogue with stakeholders in order to establish adaptation skills and competences. The BMU has the lead for the development of the German adaptation policy; it hence takes an integrated approach towards adaptation that involves a broad thematic variety and goes beyond its core topics such as environmental protection and nature conservation.

A short overview of stakeholder participation activities, their central subject and purpose is given in Table 1

Table 1: Overview of analyzed BMU stakeholder participation events and processes

Stakeholder participation event	Central subject and purpose
National Stakeholder Workshop I, II, III, IV (2005, 2006, 2007, 2010)	To integrate public and expert knowledge and perspectives into the development of a policy approach for climate change adaptation.
BMU Expert Workshop (2008)	To receive feedback from expert audience about expectations and aims concerning the content and structure of the German Adaptation Strategy.
Symposium: Prioritization of Research Needs (2008)	To receive expert input from the scientific community in order to identify and prioritize research needs concerning adaptation to climate change in Germany.
National Conference (2009)	To communicate contents of a German Adaptation Strategy to a broader public and to receive recommendations from practitioners, economy, politics and science for implementation options supporting the German Adaptation Strategy.
Workshop-Discussion with Municipalities (2009)	To identify operative requirements concerning climate change adaptation on municipal level.
Departmental Research Conferences (2009, 2010)	To foster exchange between BMU funded research regarding adaptation to climate change. To consolidate and synthesize existing research results. To identify needs for future research.
Expert Hearing on the draft Adaptation Action Plan (2011)	To receive decision makers' feedback on feasibility and acceptance of areas and measures contained in the action plan

Stakeholder participation event	Central subject and purpose
Regional Conference: Adaptation in Coastal Zones (2011)	To create and raise awareness for adaptation needs within local and regional decision-makers and multipliers. To aid orientation for adaptation action and foster network building within the region.
Research / Consultancy project	**Central subject and purpose of stakeholder involvement**
Information-, Communication and Cooperation System for the German Adaptation Strategy (2008 – 2009*)	To include expert support in order to design a promising strategy of information, communication and cooperation on adaptation issues.
Series of Thematic** Stakeholder Dialogues: Risks and opportunities of Climate Change (2009 – 2010 and 2011 – 2014)	To sensitize central actors in different sectors of interest. To identify operative requirements for these sectors. To develop approaches for specific adaptation strategies and possible measures.
Development of an Indicator Concept for the German Strategy on Adaptation to Climate Change (2008 – 2010*)	To include sectoral expertise in the development of indicators for a feasible evaluation of adaptation measures and policies.
"Tatenbank" Evaluation of Adaptation Projects: Assessment and reward of realized Adaptation Projects and Measures	To assess and communicate good practice in adaptation action.
BOKLIM – Application of Soil Data in Climate Adaptation (Workshop within the project Application of soil data in climate research)	To receive expert's input for necessary changes in existing data bases on soil monitoring and soil survey to facilitate adaptation to climate change. To jointly develop recommendations for next steps to coordinate and optimize future monitoring and survey activities and for data provision.
Group Delphi Water Management (within the project WASKlim: Development of a transferable concept to determine the adaptability of sensitive sectors to climatechange on the example of water management)	To receive input from experts concerning relevance, prioritization, and feasibility of adaptation action and planning in water management.

* First phase of research and consultancy. Research and consultancy continue with follow-up projects.

** Thematic stakeholder dialogues were conducted for the following sectors and cross-cutting issues: Coastal Protection, Energy, Transport Infrastructure, Insurance, Chemistry, Disaster Control and Civil protection, Metropolitan Regions, Norms and Standards, Vocational Education and Training, Corporate Risk Management, Risk Management in Planning Processes.

2.1.1 Institutional Setting

The Environmental Ministry has taken the lead for the overall adaptation strategy development and implementation activities on the national level. Participation processes initiated by the BMU and UBA therefore pursue two central policy aims:

- Organize and support interdepartmental and multi-level cooperation for the development and implementation of adaptation strategies and action,
- Include the wider public (diverse actors of local and specific contexts and interests) as well as scientific experts in the identification of adaptation needs, possible measures and activities.

Being aware of the novelty of adaptation issues, BMU and UBA also pursue the aim of knowledge generation by

- Funding of scientific and consultation projects for adaptation within the ministry's regular research agenda.

The latter includes scientific projects on specific issues, e.g. soil, water or forestry, as well as the scientific and/or consulting support for policy strategies and measures such as communication or evaluation of adaptation to climate change. The projects were conducted by independent and assigned researchers or consultants and lasted between one and three years. Project designs were developed in close cooperation with BMU/UBA representatives.

Regarding the stakeholder participation initiated by the BMU/UBA, one can distinguish between approaches which are integrated into these particular research and consultancy projects, and single events, such as workshops and conferences, being conducted in order to integrate stakeholders into the policy development and implementation process. Processes of invitation and selection of stakeholders differed strongly. Some events were open and communicated to all interested stakeholders (e.g. the National and Regional Conferences or the National Stakeholder Workshop), whereas some events had limitation in participation (e.g. the Expert Hearing on the draft Adaptation Action Plan or the Group Delphi Water Management). Stakeholders were selected by the assigned research team or organizers but always in agreement with BMU/UBA representatives, who therefore could affect stakeholder involvement throughout the process.

2.1.2 Objectives

Initiating stakeholder participation, the BMU/UBA pursued miscellaneous aims. Depending on the specific and various aims of each activity, the participation approaches differed in their orientation and objective of stakeholder involvement: some were rather science-based and others more policy-based involvement approaches. The overall objectives for the stakeholder participation can be summarized as

- Development of policies,
- Creating support and acceptance for policies,
- Implementation and realization of policies,
- Identifying modification needs in the political framework,
- Deepening the understanding of adaptation issues and challenges,
- Supporting network building and providing information for specific sectors and adaptation problems,
- Enabling and supporting actors to realize adaptation processes.

Development of policies: In elaborating, developing and specifying adaptation policies the BMU/UBA is dependent on stakeholders such as local and regional authorities, private sector representatives, or scientists. They have the local as well as context and expert knowledge and experience the BMU/UBA needs to adapt their policies to existing social needs, and hence to develop, form and establish a national adaptation concept. Concerning the development of the

German Adaptation Strategy, one can distinguish two phases of stakeholder participation in policy development, partly overlapping in time:

The first phase aimed at **generating a knowledge base**. Stakeholders were involved

- To collect information about the state of knowledge regarding impacts, risks and opportunities of climate change,
- To gain insight into stakeholders' perspectives on the relevance of the subject,
- To identify knowledge gaps and research needs.

Examples are the first National Stakeholder Workshop in 2005, which focused on questions of vulnerability to climate change in Germany. The Thematic Stakeholder Dialogues with diverse sectors constantly contributed to these objectives within the specific fields of action such as coastal protection, transportation infrastructure or energy systems. The Symposium: Prioritization of Research Needs in 2008 had the specific aim to support a structured discussion within the research community, policy makers, and representatives of the private sector. In 14 thematic working groups (e.g. communication and transport, energy, protections against extreme weather events, human health) 230 participants exchanged their views and perspectives on climate change effects in the respective sphere of activity, the existing knowledge about effects and adaptation options as well as knowledge gaps and the priority of research needs. This first phase can be considered as mainly science-based dialogue process, since existing knowledge was bundled and socially relevant research gaps and questions were identified.

The second phase consists of the **development of a draft strategy and the identification and description of measures and adaptation options**. During this phase, stakeholder involvement also aimed to discuss

- Questions regarding prioritization, feasibility and responsibilities of adaptation measures,
- Necessary framework conditions,
- Spheres of activities and adaptation options.

Moreover, stakeholders were asked for specific needs concerning information and support in detail and expectations concerning the political framework in general (National Stakeholder Workshop II & III in 2006 & 2007, BMU Expert Workshop in 2008). In this second phase policy-based dialogue approaches were more dominant.

Implementation and realization of policies: An integral part of the German Adaptation Strategy was the formulation of an Adaptation Action Plan. This Action Plan has been enacted by the German government in 2011 and builds the central implementation activity of the German Adaptation Strategy. The formulation and development of the Action Plan was supported by a wide range of participatory activities by BMU/UBA and their research and consultancy subcontractors. Exemplary is the fourth National Stakeholder Workshop realized in 2010, which involved over 200 participants and aimed at discussing stakeholder expectations with regard to the contents of the Adaptation Action Plan. A further example is the expert involvement into the development of an Information, Communication and Cooperation System for the German Adaptation Strategy. The consultants within the project conducted interviews with stakeholders from all fields of action within the German Adaptation Strategy. The

interviews focused on the experts' opinion and perspectives about successful information and communication measures of adaptation issues.

Creating support and acceptance for policies: In order to create support and acceptance, the important task of BMU/UBA is to sensitize central stakeholders; this is furthermore a main aim of almost all BMU/UBA stakeholder approaches. To create support and acceptance for policies BMU/UBA moreover intend to stimulate dialogue between public administration, experts and stakeholders. Exemplary is the expert hearing on the draft version of the Adaptation Action Plan in spring 2011. Central and selected stakeholders were involved to discuss and comment on the draft version. However, this hearing was only open to selected and invited representatives.

Identifying modification needs in the political framework: The German Adaptation Strategy follows a process-oriented approach. Within this approach it encourages a discourse about the political framework and existing institutional arrangements concerning their role in promoting or hampering adaptation to climate change. Therefore, a further objective of stakeholder involvement is the discussion and identification of existing barriers to adaptation actions and measures. For example, the Thematic Stakeholder Dialogues discuss these questions with their broad range of participating actors in their specific areas of action by specifically discussing factors that hamper adaptation in the respective fields and by addressing the question how to overcome these barriers.

Deepening the understanding of adaptation issues and challenges: A central objective of BMU/UBA's participation approaches is to deepen the understanding of climate change effects, adaptation needs and options. Deepening the understanding refers to both, initiators as well as participating stakeholders. From their own perspectives and knowledge, stakeholders are able to give important input that is relevant for problem framing and solution development, both in scientific research processes as well as policy development. On the other hand, almost all participation activities aim at informing and sensitizing the participating stakeholders about climate change effects and adaptation needs.

Support network building and communication about vulnerability and adaptation: The support of cross-stakeholder cooperation is a main objective of almost all participation activities initiated by UBA/BMU. Because of the cross-cutting nature of adaptation problems and measures, diverse knowledge stocks and knowledge holders need to be integrated. As adaptation issues and measures mostly need cross-sectoral activities, close collaboration is needed to identify synergies and avoid conflicts. Almost all activities initiated by BMU/UBA aimed at supporting network building and exchange between stakeholders and to foster autonomous and durable networks. With the Regional Conference: Adaptation in Coastal Zones and the Workshop-Discussion with Municipalities BMU / UBA underpinned the necessity of multi-level and local network building and communication. The Thematic Stakeholder Dialogues initiated and encouraged sectoral network building.

Enabling and supporting actors to realize adaptation processes: Since adaptation action needs to be taken by regional and local actors as well as by economic actors, BMU/UBA's stakeholder events aim at supporting diverse actors in developing and implementing adaptation actions. They hence provide opportunities to learn from good practice and to exchange experience with other actors. A central approach in supporting local action is provided by the "Tatenbank" (Online data base with adaptation examples) developed through the Assessment and Reward of

realized Adaptation Projects and Measures. Additionally different events, for instance the Thematic Stakeholder Dialogues, included the presentation of good practice examples. BMU/UBA's intention is to enable and empower participants in a way that they can act as multipliers and promoters for adaptation in their organizations.

2.1.3 Central Adaptation Problems Addressed

Conducting stakeholder dialogues, the BMU and the Federal Environment Agency (UBA) gave regard to a variety of fields of action, rather than concentrating on particular adaptation problems of potential climate change impacts. This is in line with the BMU's coordinating and leading role in the development of the German Adaptation Strategy and Adaptation Action Plan. Hence the dialogues covered almost all sectors and areas of the DAS, fishery being the only exception (see Table 2). Remarkable is that with few exceptions, the dialogues do not focus on single action fields but cover multiple subjects. Exemplary are the National Stakeholder Workshops, the BMU Expert Workshop and the Thematic Stakeholder Dialogues.

Beyond the raise of issues in these general action fields, a strong emphasis is given to cross-cutting themes. These are:

- Risk management and prevention in respect of extreme weather events,
- Strategies of communication and sensitization,
- Adaptation to climate change in education,
- Methods to prioritize adaptation measures,
- Financial instruments and incentives.

2.1.4 Stakeholders Involved

Due to the broad variety in adaptation issues addressed by the BMU/UBA projects, involved stakeholder groups are manifold (see Table 3). Participants also came from a broad range of sectors and professional areas that can be summarized to six actor groups.

- *Sciences and Research.* Researchers from universities and non-university research centres were often invited as experts. Their thematic backgrounds reflect the fields of action listed up in 2.1.3. It is worth mentioning that scientists and researchers were participating in almost all events. This underlines the importance of scientific knowledge in discussing and developing adaptation options.
- *Politics.* The participation of elected members of parliaments and councils on national as well as on local level was rather low. They were only explicitly integrated in the second National Stakeholder Workshop and the National Conference.
- *Administration.* Due to their important role for sensitizing other actors and for implementing adaptation strategies and measures, administration representatives from all fields of action and from different levels (local administration representatives as well as representatives from national ministries and authorities) were involved. In the second National Stakeholder Workshop even representatives from foreign governmental authorities, e.g. Austria, participated. Participation commitment differed among departments, e.g. representatives from environmental departments (on regional as well

as local level) did participate in a greater number than economic departments. Other important administration representatives involved came from the subordinate authorities of the different federal ministries.

- *Companies.* Company representatives were invited to nearly all stakeholder events. Their background, again, reflects the action fields mentioned in 2.1.3. Within this stakeholder group a phenomenon could be observed that is common in many participation processes: The participating company representatives were predominantly from large corporations. Small and medium sized companies were underrepresented, except for a few examples in the thematic stakeholder dialogues (e.g. transport).
- *Business Associations.* Representatives of business associations were invited to nearly all stakeholder events. Some of the Thematic Stakeholder Dialogues were realized in close collaboration with business associations, e.g. chemistry, insurance or transport infrastructure.
- *Civil Society, labour unions, interested public and individuals* were partly represented. Representatives from NGOs, especially environmental organizations, did participate in events and projects, although their number was rather small. Active involvement could be realized for example in some of the Thematic Stakeholder Dialogues (e.g., energy, norms and standards, and transport). Unions did only eventually take part in participation activities (e.g. Thematic Stakeholder Dialogue on vocational education and training). A lot of public participation events were open to the interested public in general, but besides a single citizen's initiative on flood protection, participation and involvement was rather low.
- *Media and Journalists:* As the dialogues were not focused on integrating them, only very few media representatives and journalists were involved in the participation activities. They were additionally integrated into the process through accompanying press conferences.

2.1.5 Dialogue Design and Degree of Participation

Related to the degree to which decisions, made by stakeholders, affect the process of policy making or project content, we can find two degrees of stakeholder participation in the BMU/UBA processes: stakeholder communication and stakeholder consultation. Co-production and co-decision was not realized, since the initiators set research and/or discussion questions, design and issues and took final responsibilities about results and policy formulation. However, stakeholder processes in the majority of cases were not designed either as communication or as consultation process but as a mix of both.

- *Stakeholder communication:* The one-way flow of information, either from initiator to stakeholder or the other way round, was well-balanced. On the one hand, the BMU/UBA and their assigned researchers or consultants provided input to inform and sensitize stakeholders. Accordingly, they tried to raise the awareness on climate change and adaptation needs among the public and decision makers in economy, policy and administration. On the other hand, information was directed from stakeholders to initiators by gathering stakeholder's local and context knowledge and information about specific issues of adaptation to climate change (e.g., BOKLIM).

- *Stakeholder consultation:* In consultation processes BMU/UBA received estimates and impulses of business, administration and other stakeholders concerning the relevance of climate change, contents of the German Adaptation Strategy, possible adaptation measures, priorities in adaptation and expectations towards the political framework. In contrast to stakeholder communication, we find a two-way flow of information as the initiators consider the assessments in developing their policies, decisions and research results.

Different degrees of participation require different types of dialogue designs. Subsequently, the different types of dialogue designs are allocated to the two degrees of participation. Moreover, two dialogue designs, applicable for both degrees, are drafted. However, in a single stakeholder participation event different designs could have been used.

2.1.5.1 Dialogue design in stakeholder communication processes

- *Questionnaires* were used prior to and during workshops to ask for expectations concerning the participatory events themselves or the content of the German Adaptation Strategy, the need for further support or for appraisals concerning the climate change effects. Questionnaires were used at the first and second National Stakeholder Workshop.
- *Registration statements* were used at the BMU Expert Workshop. During the registration process, the participants were asked to answer three questions concerning problems of adaptation, most pressing adaptation measures and the role of the BMU in the German Adaptation Strategy.
- *Interviews.* The consultants in charge of the Information, Communication and Cooperation System conducted an analysis of interests based on interviews, either per telephone or face-to-face. The stakeholders were asked about their estimations concerning important fields of actions in climate change adaptation, the need of actions as well as for information. Moreover, the participants were asked for their perspectives regarding the contents of an adaptation strategy, necessary structures and responsible actors.
- *Competitions.* The project "Tatenbank" (Evaluation of Adaptation Projects) utilized a competition to involve stakeholders. The competition „Sich zukunftsweisend wandeln – jetzt handeln: Anpassungspioniere gesucht!" served to detect good-practice adaptation measures and publicized those to a general public. The winners out of 59 contributions were chosen by representatives from politics, administration, science, economy and non-governmental organizations.

2.1.5.2 Dialogue design in stakeholder consultation processes

- *Open space.* The National Stakeholder Workshop in 2010 and the Symposium: Prioritization of Research Needs (2008) were based on the open space method. This design led to an intensive participation and in addition fostered the motivation for a durable commitment. Issues discussed were the concrete design of the Adaptation Action Plan, expectations and possible stakeholder contributions (National Stakeholder Workshop 2010) as well as the state of research, knowledge gaps and future research needs (Symposium: Prioritization of Research Needs).

- *Market place.* On a market place, products, actions and project results were exhibited in form of thematic islands. This design aimed at an open dialogue of participants with the respective experts concerning research questions and implementation challenges, where both sides can bring in their knowledge and experience. The dialogue design was applied e.g., at the National Stakeholder Workshop in 2010 and within the Workshop BOKLIM: Application of Soil Data in Climate Research.

2.1.5.3 Dialogue designs for both degrees

- *Discussion forums/working groups.* This dialogue design was applied within the BOKLIM-Workshop, at the Departmental Research Conferences and at the Workshop-Discussion with Municipalities. In small groups stakeholders were asked to discuss questions concerning data gaps and operative requirements. The discussion results were presented by the stakeholder statements. Depending on the questions the stakeholders are asked, this form is applicable to both types of dialogue design.
- *World café* as a dialogue design with focused group discussions in alternating small groups with integrated short presentations was used in all Thematic Stakeholder Dialogues to sensitize stakeholders and to foster knowledge exchange concerning climate change adaptation. The world café is applicable to both degrees of participation, depending on which questions stakeholders are asked to discuss and whether the discussions aim at giving advice or only at getting access to knowledge and perspectives.

2.1.6 Outcomes and Experience

General challenges and important insights can be summarized as follows:

Network building among the scientific community could successfully be established. A central challenge perceived by stakeholders though, is **the disperse distribution of existing knowledge**. This perception refers to both, the scientific data concerning expected impacts and the practical knowledge concerning specific effects and adaptation options. Although initiatives such as the project on the Assessment and Reward of Adaptation Projects and Measures or the Thematic Stakeholder Dialogues aimed at overcoming this difficulty, the successful and target-group specific communication of already existing knowledge remains improvable.

An important insight drawn from the Thematic Stakeholder Dialogues is, that time and efforts are worth to be invested in an ample stakeholder analysis. As one of the main goals of participation processes in adaptation at the current state is sensitization, stakeholders involved should be multipliers. This way, further knowledge distribution and awareness rising throughout the sectors can be attained more effectively. A suitable approach is to gain key actors from the sector (e.g. business association, research institute or administrative authority) or region as co-organizers, since this increases ownership and commitment throughout the process.

Many stakeholder discussions showed that consensus on overall adaptation needs and possibilities could be easily established, whereas the **identification and agreement on adequate measures is much harder to acquire**. The endeavour to find appropriate and acceptable decision making mechanisms on when to adapt and which measures to take under the given conditions of uncertainty can be supported but not solved by stakeholder

involvement. However, initiating cross-cutting and inter-departmental exchange does advance societal debate on efficient adaptation action. Within the discourse about costs and benefits of anticipating actions, stakeholders from all actor groups tend to request further information and data gathering

Furthermore, involvement efforts within the different sectors reveal that a strong need for exchange and network building exists but **durable and lasting, self-governed networks have not been established yet**. Here again, stakeholders tend to take a rather inactive position and delegate responsibility for active network building to public authorities. A single participatory event seems not to be enough to raise ownership and commitment among stakeholders that would be necessary to carry on the process.

2.1.7 Follow-Up Process and Integration into Ongoing Adaptation Processes

Acknowledging the difficulties in self-governed network building described above, BMU/UBA continue to support further participation projects and stakeholder involvement within the on-going development and implementation of adaptation policies (German Strategy for Adaptation and Adaptation Action Plan). Current and planned stakeholder involvement activities will be shortly presented in the following paragraphs.

BMU/UBA continue their series of Thematic Stakeholder Dialogues and aim at a closer thematic link between these small dialogue events and the National Stakeholder Workshops. In 2012 for instance two small dialogue events were organized on risk management in different setting (companies and planning processes) and the National Conference to be held in autumn 2012 will pick up the risk management topic, deepen the discussion from the small dialogues and place them in a broader context.

Seeking to establish a durable and effective exchange between the diverse public authorities engaged in adaptation issues, the UBA initiated a professional management and scientific support of a vulnerability network that includes national authorities.

To support local and regional decision making and exchange for adaptation strategies and options, a series of regional adaptation conferences, addressing the diverse and specific spatial challenges within German regions will be realized in cooperation with actors from the federal states. The first one took place in the German coastal region in 2011 and was organized in co-operation with four federal states (Bundesländer) and three KLIMZUG projects (see chapter 2.2); the second will follow in autumn 2012.

Furthermore, cross-sectoral cooperation for realising adaptation options and measures will be encouraged by the realization of regional market places. The aim is to provide an open space for voluntary and cooperative agreements between stakeholders (especially from business and NGOs).

2.1.8 Conclusions

The participative approaches initiated by the Federal Ministry for the Environment and its subordinate agency the Federal Environment Agency include science-based and policy-based involvements aiming at improving the knowledge base on adaptation, developing policies, creating support for policies and ensuring their realization and implementation. Through a variety of formats and methods a broad range of stakeholders was involved. While the first

phase of participatory events was more science-based and aimed at improving the knowledge base and at spreading knowledge on vulnerability and climate change adaptation, the second phase was more policy-based and focused on discussions around the German Adaptation Strategy, the Adaptation Action Plan and possible adaptation measures.

Due to their important role in the development of regional adaptation strategies and measures, administration representatives from all fields of action and different levels were involved. Moreover, involvements aimed at deepening the understanding of adaptation challenges of both initiators and stakeholders. Through exchange of local experience and communication about vulnerability and adaptation stakeholders should be enabled to realize adaptation processes within their scope of action. The importance of scientific knowledge in the adaptation process was reflected by the fact that scientists and researchers participated in almost all events. Representatives from large corporations and business associations were also involved in many events, whereas the involvement of civil society and interested public was rather low.

Regarding the degree to which stakeholders participated, the BMU/UBA participatory approaches reached a middle degree of participation realizing stakeholder communication and stakeholder consultation. It could also be observed that stakeholder processes in the majority of cases were not designed either as communication or as consultation process but as a mix of both, realized through discussion forums, working groups and world cafés as dialogue design suitable for both aims.

In total, the BMU/UBA events involved more than thousand participants; however, many stakeholders participated in several events. In order to keep stakeholders' commitment it is important that participation events make progress and take up new challenges that stakeholders are confronted with in their daily adaptation work. Through the variety of formats and methods BMU/UBA stakeholder events offered new insights also for advanced stakeholders. However, many stakeholder events still aim at reaching and sensitizing new stakeholders and hence repeat topics that are already familiar to advanced stakeholders, which always includes the risk that those get bored. In planning stakeholder events it is hence important to define goals and target groups and to make sure that both are coherent.

The goal to establish new stakeholder networks through single participation events is too ambitious. An important insight drawn from the participatory approaches is that time and efforts are worth to be invested in an ample stakeholder analysis. Moreover, it is valuable to establish cooperations with key actors from a sector or region (e.g. business association, a research institution or a public authority) that can take the lead in follow-up activities.

Table 2: Sectors addressed in analyzed participatory approaches (BMU/UBA)[2]

Project/ Participatory approach	DAS Sectors												
	Human health	Building sector (incl. housing and real estate)	Water regime and management, costal and marine protection	Agriculture and Soil	Biological diversity (incl. nature conservation)	Forestry and forest management (incl. wood)	Energy industry	Financial services industry	Transport and transport infrastructure (incl. traffic)	Trade and Industry	Tourism industry	Cross-sectional topics	
												Spatial and regional planning	Civil protection
National Stakeholder Workshop I (2005)	x		x	x	x	x			x		x		
National Stakeholder Workshop II (2006)	x		x			x	x						
National Stakeholder Workshop III (2007)	x		x		x	x	x	x	x			x	x
National Stakeholder Workshop IV (2010)			x						x				x
BMU Expert Workshop (2008)	x		x	x	x	x	x		x			x	
Symposium: Prioritization of Research Needs (2008)	x		x	x	x	x	x		x		x	x	
National Conference (2009)	x	x	x	x		x					x	x	
Workshop-Discussion with Municipalities (2009)	No information												
Departmental Research Conference I (2009)	x	x	x	x	x	x	x	x	x	x	x	x	x
Departmental Research Conference II (2010)	x		x	x	x		x		x			x	x

[2] The DAS Sectors "Agriculture "and "Soil" have been summarized because they are often addressed together in the Projects/Participatory approaches; The DAS Sector Fishery has been left out because it was not addressed by the Projects/Participatory approaches.

Project/ Participatory approach	DAS Sectors												
	Human health	Building sector (incl. housing and real estate)	Water regime and management, costal and marine protection	Agriculture and Soil	Biological diversity (incl. nature conservation)	Forestry and forest management (incl. wood)	Energy industry	Financial services industry	Transport and transport infrastructure (incl. traffic)	Trade and Industry	Tourism industry	Cross-sectional topics	
												Spatial and regional planning	Civil protection
Information-, Communication and Cooperation System for the German Adaptation Strategy (2008 – 2009)	x	x	x	x	x	x		x	x	x	x	x	
Series of Thematic Stakeholder Dialogues: Risks and opportunities of Climate Change (2009 – 2010) (2011-2014)							x		x				x
Development of an Indicator Concept for the German Strategy on Adaptation to Climate Change (2008 – 2010)	x	x	x	x	x	x	x	x	x	x	x	x	x
Regional Conference: Adaptation in Coastal Zones (2011)			x	x	x		x		x	x	x	x	x
Expert Hearing on the draft Adaptation Action Plan (2011)	No information												
"Tatenbank" Evaluation of Adaptation Projects: Assessment and reward of realized Adaptation Projects and Measures	No specific sector addressed. Participation possible for adaptation measures both sector specific + all-embracing.												
BOKLIM – Application of Soil Data in Climate Adaptation			x	x	x	x							
Group Delphi Water Management			x	x	x	x						x	x

Table 3: Actor groups addressed in analyzed participatory approaches (BMU/UBA)

Project/ Participatory approach	Actor groups							
	Sciences and Research	Politics	Administration	Companies	Business Associations	Media/ Journalists	NGOs	Interested public and individuals
National Stakeholder Workshop I (2005)	x		x	x	x		x	
National Stakeholder Workshop II (2006)	x	x	x	x			x	
National Stakeholder Workshop III (2007)	x		x		x		x	x
National Stakeholder Workshop IV (2010)	x		x	x	x		x	
BMU Expert Workshop (2008)	x		x	x	x			
Symposium: Prioritization of Research Needs (2008)	x		x	x	x		x	
National Conference (2009)	x	x	x	x	x	x	x	
Workshop-Discussion with Municipalities (2009)	x		x					
Departmental Research Conference I (2009)	x		x					x (first day)
Departmental Research Conference II (2010)	x		x		x		x	
Information-, Communication and Cooperation System for the German Adaptation Strategy (2008 – 2009*)	x			x	x	x	x	
Series of Thematic Stakeholder Dialogues: Risks and opportunities of Climate Change (2009 – 2010) (2011-2014)	x		x	x	x		x	
Development of an Indicator Concept for the German Strategy on Adaptation to Climate Change (2008 – 2010)	x		x	x	x			
Regional Conference: Adaptation in Coastal Zones (2011)	x	x	x	x	x			
Expert Hearing on the draft Adaptation Action Plan (2011)	No information							
"Tatenbank" Evaluation of Adaptation Projects: Assessment and reward of realized Adaptation Projects and Measures			x	x	x			x
BOKLIM – Application of Soil Data in Climate Adaptation	x		x	x	x			

Project/ Participatory approach	Actor groups							
	Sciences and Research	Politics	Administration	Companies	Business Associations	Media/ Journalists	NGOs	Interested public and individuals
Group Delphi Water Management	x		x		x		x	

2.2 Federal Ministry of Education and Research (BMBF)

The Federal Ministry of Education and Research (BMBF) does not directly engage in stakeholder processes, but is responsible for numerous research projects that have been conducted or started since 2005 in the framework of two research programs where stakeholder involvement was explicitly demanded in the respective calls: "KLIMAZWEI – Research for climate protection and protection from climate impacts" (2005-2011) and even more prominent in "KLIMZUG – Managing climate change in the regions for the future" (2009-2015).

The funding priority "Research for climate protection and protection from climate impacts" KLIMAZWEI is embedded in the framework program „Research for sustainability" (FONA) and aims at both climate protection and adaptation to climate change. While previous research programs aimed mainly at understanding climate change impacts recent programs focused on applied research activities aiming at identifying new strategies and innovative solutions for mitigation and adaptation. The BMBF program call explicitly asked for transdisciplinary research leading to real world impacts and involving stakeholder processes. Stakeholder involvement far beyond usual research cooperation was explicitly encouraged.

Out of 40 KLIMAZWEI research projects 19 projects addressed adaptation on climate change. Eight projects showed active stakeholder involvement exceeding the usual practice, i.e. information giving and taking during the project and knowledge transfer activities in the final phase. Seven of these projects form the base of the following analysis of stakeholder involvement. Interviews with project staff gave meaningful insights on opportunities as well as limitations of stakeholder involvement.

The current "KLIMZUG – Managing climate change in the regions for the future" research program aims at developing regional adaptation approaches. It comprises natural science subprojects providing information on possible regional climate change effects. This task is posing high demands on the regionalization of models that were available only on considerably larger scales before. But the central focus of the KLIMZUG program lies on the establishment of regional stakeholder networks that should be enabled to deal with the challenges of adapting their region to climate change. This is also reflected in unusually large shares of work tasks and budgets on economic and other social science subprojects or even coordinators. While the KLIMAZWEI program has been finalized recently, the projects within the KLIMZUG program are still ongoing. Therefore, the following review can only consider intermediate results and it shall be noted that data is not yet available even for events that already took place as these have not yet been evaluated. Hence, the following review of KLIMZUG projects is preliminary and makes no claim to be exhaustive.

With the KLIMZUG call, the Ministry for Education and Research went a step further towards transdisciplinary research. All KLIMZUG projects were explicitly asked for launching dialogue processes that should lead to structures of communication and interaction between stakeholders and institutions that persist after finalization of the projects. For this reason, all projects will be considered in the following review. Since the projects will be working until 2014/2015, the success and challenges of the KLIMZUG attempts could not be evaluated so far.

Generally, two types of projects could be identified within both groups. On the one hand we have the *science-based projects* conducted in a more or less traditional way and on the other

hand *policy-based projects,* which address and involve stakeholders as part of if not the main goal of the project – with participation as mean and end at the same time. Finally there are projects that include both characteristics in their design. Even though the program outline requested stakeholder involvement, the type of projects funded by the BMBF are usually science-based, research-oriented projects, thus policy-based projects were the exception rather than the rule so far.

The assessed KLIMAZWEI research projects differ strongly from one another in almost all categories analyzed. Hence, it is not easy to give a general judgement but single examples will be mentioned if they show interesting approaches or insights. In these cases, the acronym of the project will be added. In the annex you will find the list of projects assessed and respective links for further information. The assessed KLIMZUG projects pursue similar goals but differ in the way they try to reach these goals. As the difference is not too large, the projects will be reviewed in an integrated manner. A short overview of stakeholder participation activities, their central subject and purpose concerning both programmes is given in Table 4.

Table 4: Overview of analyzed projects within BMBF funded KLIMAZWEI and KLIMZUG programmes

Research Project	Central subject and purpose of stakeholder involvement
KLIMAZWEI	
Network for Climate Change Adaptation in the Region Starkenburg (Klaranet)	To sensitize local and regional planning authorities, to enhance their network activities, to empower follow-up activities.
Climate Change Lower Weser Region - Informing, Realising, Acting (KWU)	To sensitize local and regional actors by jointly realized adaptation activities, to enhance their network activities, to empower follow-up activities.
Success Factors for Climate Change Mitigation and Adaptation (ErKlim)	To develop effective strategies for the promotion of mitigation and adaptation measures in the building and the mobility sector, to identify and avoid conflicting activities.
Mainstreaming of Climate Risks and Opportunities in the Financial Sector	To raise awareness in the financial sector, to integrate climate change (and protection) considerations into decision-making processes, to develop new approaches to risk assessment.
Land, Climate and Resources (LandCaRe) 2020 – Foresight and Potentials in Rural Areas under Regional Climate Change	To determine the needs of potential users, to spread research results.
Adaptation Strategies for Sustainable Forest Management under Climate Change – Decision Support System "Forest and Climate Change"(DSS-WuK)	To determine the needs of potential users, to spread research results.
Climate Trends and Sustainable Development of Tourism in Coastal and Low Mountain Range Regions (KUNTIKUM)	To raise awareness and to sensitize for the need of action, to identify challenges and fields of action, to jointly develop adaptation strategies.

Research Project	Central subject and purpose of stakeholder involvement
KLIMZUG	
Dynamic Adaptation to the Effects of Climate Change in the Emscher-Lippe Region (Ruhr Basin) (Dynaklim)	To jointly develop and implement adaptation activities regarding the regional water balance with sensitized local and regional actors. To enhance their network activities, to enable actors to implement adaptation measures, to empower follow-up activities.
Innovation Network of Climate Change Adaptation Brandenburg Berlin (INKA BB)	To facilitate the strategic ability of adaptation of actors in the economy, politics and administration to climate change, to enhance their network activities, to enable actors to implement adaptation measures, to empower follow-up activities.
Strategic Approaches to Climate Change Adaptation in the Hamburg Metropolitan Region (KLIMZUG Nord)	To jointly develop and implement adaptation activities with sensitized local and regional actors, to enhance their network activities, to enable actors to implement adaptation measures, to empower follow-up activities.
Regional Network for Climate Change Adaptation - Northern Hesse (KLIMZUG Nordhessen)	To identify regional and urban vulnerabilities. To jointly develop, test and implement adaptation activities with sensitized local and regional actors, to enhance their network activities, to enable actors to implement adaptation measures, to empower follow-up activities.
Prospects for Climate-Adapted Innovation Processes in the Model Region Bremen-Oldenburg in North Western Germany (Nordwest2050)	To define climatic vulnerability in integrated sectors. To jointly develop and implement adaptation measures with sensitized local and regional actors, to enhance their network activities, to enable actors to implement adaptation measures, to empower follow-up activities.
Regional Adaptation Strategies for the German Baltic Sea Coast (RADOST)	To jointly develop and implement adaptation measures with sensitized local and regional actors, to enhance their network activities beyond the regional bounds, to enable actors to implement adaptation measures and to empower follow-up activities
Development and Testing of an Integrated Regional Climate Change Adaptation Programme for the Model Region of Dresden (REGKLAM)	To jointly identify, develop and implement adaptation measures with sensitized local and regional actors, to enhance their network activities, to enable actors to implement adaptation measures, to empower follow-up activities.

2.2.1 Institutional Setting

The projects were conducted by interdisciplinary research teams coming from various institutions, i.e. universities, research institutes and public administration bodies but also public utilities, companies and consulting and facilitating agencies. All projects were encouraged to

actively include their respective target groups and involved them at least by consultation and information exchange activities.

The selection of stakeholders in all cases was determined by the project design. The inclusion of stakeholders in planning and conducting workshops or other activities varied. Analysis and documentation was always done by the researchers.

2.2.1.1 KLIMAZWEI

The institutional setting for the science-based approaches distributes tasks and responsibilities in the usual way: the researchers set the agenda, define goals and facilitate stakeholder workshops or other activities in order to raise awareness for the project, to detect the needs of potential users of the project output and to gather information to be fed in the research process. A typical example is the LandCare 2020 project, that included potential users in the identification of central research questions via a joint decision making process in order to ensure the appropriateness and reliability of the Decision Support System. For the Climate Mainstreaming project the integration of stakeholders in decision-making processes and agenda setting was essential for gaining them as partners for the research activities. In this project stakeholders set own impulses inspired by other processes or projects.

The policy-based projects had an explicit bottom-up approach that included the participation of stakeholders in planning and conducting project activities, i.e. joint workshops, information activities or working group meetings. These projects typically included joint decisions on content and and/or products. The role of the project team comprises both facilitation and research with a focus on facilitation. In most projects the project team alone facilitated the participatory events, in some an active stakeholder involvement also in planning and facilitation was explicitly aimed at (Klaranet, KWU, Kuntikum), but was not always realized. Most projects included follow-up activities as part of the project. Ongoing activities initiated or carried on by stakeholders were seen as an indicator for the project's success.

2.2.1.2 KLIMZUG

As the KLIMZUG projects will be working until 2014/2015 most data is not yet available. The existing data did not contain sufficient information about the institutional setting of participatory approaches; hence this category will not be reviewed here.

2.2.2 Objectives

Concerning BMBF stakeholder integration in both reviewed programmes, one can distinguish two approaches with basically different objectives:

- *Science-based approaches:* Both programmes comprise natural science subprojects providing information on possible regional climate change effects. The involvement of stakeholders in those projects was a guarantee and necessity for the availability and quality of data (e.g. Climate Mainstreaming). Furthermore, some subprojects integrated stakeholders as partners in knowledge production (e.g. LandCaRe 2020, RADOST).
- *Policy-based approaches:* Both programmes comprise subprojects mainly aiming at creating new or supporting existent stakeholder networks in order to initiate, identify, develop and implement adaptation processes on local or regional level (e.g. Klaranet, KWU, Nordwest2050, RADOST).

2.2.2.1 KLIMAZWEI

One central goal of the programme was to sensitize key actors in the addressed regions and sectors. How this has been realized and who was considered as a key stakeholder within a project varied considerably.

Objectives of participative processes of the science-based KLIMAZWEI approaches:

- *Awareness raising, gaining partners and approval:* By involving stakeholders in the beginning the project intended to raise awareness, to win approval for the project and to gain stakeholders as partners for the project.
- *Checking social relevance, deepening the understanding:* During the project the presentation and discussion of interim results and the inclusion of stakeholder feedback for the ongoing research were the main objectives.
- *Popularization and circulation of research results:* With a stakeholder event in the end in most cases projects intended to address their target audience: they presented final results or products and aimed at improving the dissemination and use of research results. In general the products were designed for certain stakeholder groups, e.g. information platforms, decision support systems (LandCaRe 2020, DSS WuK). Their compilation was preceded by a needs analysis via interviews or group discussions.

Objectives of participative processes in KLIMAZWEI policy-based approaches:

- Sensitization and awareness raising,
- Enhancing networking processes and initiating follow-up activities after the end of the project (Klaranet, KWU),
- Joint realization of products, studies or other activities,
- Empowerment of (mainly regional/local) stakeholders to further initiate adaptation activities on their own (KWU, Klaranet, Climate Mainstreaming).

2.2.2.2 KLIMZUG

One central goal of the program is to jointly develop regional adaptation approaches with regional and local stakeholders, to enable them to implement these approaches and to empower follow-up activities.

Objectives of participative processes of the science-based KLIMZUG approaches are:

- To provide a knowledge base for experts and key actors,
- To identify knowledge gaps and research needs,
- To collect information about the state of knowledge regarding impacts, risks and opportunities of climate change,
- To gain insight into stakeholders' perspectives on the relevance of the subject,
- To determine the needs for adaptation in the region.

Objectives of participative processes in KLIMZUG policy-based approaches are:

- To establish and enlarge stable regional stakeholder networks. The central focus of the KLIMZUG program lies on the establishment of regional stakeholder networks that

should be enabled to deal with the challenges of adapting their region to climate change,

- To jointly identify and develop innovative approaches to climate change related risks and opportunities as well as adaptation solutions and measures,
- To enable and support stakeholders to realize the regional adaptation process,
- To inform, educate and sensitize stakeholders,
- To create acceptance for climate adaptation,
- To determine the needs for adaptation in the region,
- To ensure acceptance and application of research objectives and results.

2.2.3 Central Adaptation Problems Addressed

The projects in both programmes mainly addressed problems, where knowledge of climate change needs to be generated, collected, refined, communicated or transferred in a way that actors at different levels recognize the need of action, understand urgent problems and are able to develop adaptation strategies.

2.2.3.1 KLIMAZWEI

In particular the following climate impacts were addressed:

- Extreme weather events and related risks (damages due to storms, heavy rains, droughts,
- Water scarcity,
- Urban hotspots,
- Challenges and potential conflicts for architecture.

Moreover, the following sectors and areas from the German Adaptation Strategy have been addressed (see Table 5):

- Human health,
- Building sector,
- Biological diversity (incl. Nature conservation),
- Water management (regarding questions of urban planning),
- Agriculture,
- Forestry and forest management (incl. wood),
- Financial services industry,
- Tourism industry,
- Transport and transport infrastructure,
- Cross-cutting themes: Spatial and regional planning.

2.2.3.2 KLIMZUG

The projects address all sectors and areas from the German Adaptation Strategy (see Table 5). The following sectors and areas are addressed particularly often:

- Water regime and management, costal and marine protection,
- Agriculture,
- Human health,
- Biological diversity (incl. nature conservation),
- Spatial and regional planning.

Furthermore, the following sectors and comprehensive topics, not explicitly mentioned in the German Adaptation Strategy, are addressed:

- Food industry (Nordwest2050),
- Port management and logistics (Nordwest2050),
- Consumption (Nordwest2050),
- Education (KLIMZUG Nordhessen),
- Disaster management (Dynaklim),
- Climate-focusing economic development (Dynaklim).

2.2.4 Stakeholders Involved

2.2.4.1 KLIMAZWEI

As the funding priority focused on applied research and the development of new strategies, the projects were designed as transdisciplinary projects. The development of new strategies and innovative solutions need stakeholder involvement and the project design determined the type of integrated stakeholders. Particularly in the policy-based projects all stakeholders had a strong link to local and regional level activities. They typically were integrated in regional/local networking, planning and decision processes and / or work in the sector the project focused on (e.g. tourism, agriculture). Stakeholders came from:

- *Administration*: regional and local administration bodies,
- *Commercial associations*: trade and business associations (mostly regional level),
- *Companies*: transnational financial corporations and single corporations from the respective sectors (e.g. tourism),
- *NGOs and interested public*: civil society organizations and single interested citizens,
- *Science and research*.

The KWU project followed an elaborated selection process in order to gain the key persons who had a multiplier function and / or were already organized in networks. The researchers described the selection process as very challenging and vital for the success of the project.

The Climate Mainstreaming project focused on transnational financial corporations. In order to gain their cooperation the communication had to follow the principle of confidentiality. Hence,

the inclusion of other stakeholders, i.e. from civil society, was only possible in a superficial manner.

The ErKlim project brought together climate protection and climate change adaptation experts from all relevant groups (civil society, government, industry, and science) in order to cover and extend existing networks for mitigation and adaptation to climate change in the fields of housing and mobility and to identify possible conflicting objectives and success factors.

2.2.4.2 KLIMZUG

The KLIMZUG projects explicitly aim to launch dialogue processes that should lead to structures of communication and interaction between stakeholders and institutions persisting after the projects' finalization. Some projects even highlight that their success depends on the involvement of all relevant stakeholders. Stakeholders come from a broad range of sectors and professional areas:

- *Science and Research.* All projects integrate representatives of universities and non-university research centres as experts.
- *Politics.* The participation of elected members of parliaments and councils on national as well as on local level is rather scarce. KLIMZUG Nordhessen for example tries to integrate local politics into the "Regionalforum".
- *Administration.* Due to their important role for sensitization and implementation of adaptation strategies and measures, administration representatives from different levels (representatives from local and regional administrative bodies as well as representatives from local and national ministries and authorities) are involved.
- *Companies and business associations.* Almost all projects integrate representatives from companies and business associations to identify, develop and discuss adaptation measures in their respective sectors.
- *Media and Journalists.* Due to their important role in communicating the need of climate adaptation, employees of press offices, newspaper editors and media experts are integrated in two projects (Dynaklim, Nordwest2050).
- *Civil society.* Representatives from civil society, such as regional environmental NGOs, are integrated into many projects, due to their important role in implementing adaptation measures (e.g. Nordwest2050).
- *Interested public and individuals.* Almost all KLIMZUG projects integrate interested citizens. Depending on the respective project, different target groups were addressed within this group of stakeholders. KLIMZUG Nord for example primarily integrated children at pre-school age, students and people aged over 50 as groups especially important for the realization of adaptation measures. RADOST is presenting and discussing project results in a series of public evening events in six cities within its project region ("RADOST on tour").

2.2.5 Dialogue Design and Degree of Participation

2.2.5.1 KLIMAZWEI

The main challenges of the adaptation research projects were to meet the requirements of a transdisciplinary approach and on the other hand to achieve the necessary knowledge transfer for enabling stakeholders to become aware of crucial problems in their sector and to develop adaptation strategies. In most science-based approaches the degree of participation remained at the consultation level. Stakeholders could provide suggestions but the experts set the agenda and decided on what was important. Hence, no stakeholder co-production could be realized. Opposed to that the policy-based approaches that explicitly addressed planning authorities and institutions had a strong cooperative character and some even reached the co-decision degree of participation. Due to the fact that all projects differ strongly in their design, the most interesting designs with regard to participative activities will be shortly outlined:

- *Klaranet* followed a bottom-up approach and wanted to enable regional stakeholders to organize adaptation activities. *Thematic groups* worked together in a continuing process and met several times (approximately every three months) during the project. The pilot region process is characterized by a *competition on adaptation concepts for pilot regions* in the beginning (community level) and joint identification of fields of action as well as an attempt to hand over the responsibility for process continuation to the stakeholders. As a third element *regional panels* have been initiated, jointly organized by the research team and stakeholders with the aim of raising awareness and ownership for adaptation issues. All in all the research team had rather a facilitating than a scientific role. Degree of involvement: stakeholder consultation and co-decision.
- *KWU* had a strong action-orientation and involved stakeholders in the development of autonomous projects that have been designed during a *workshop series*. The workshop series followed an elaborated procedure, with the thematic focus and outcome being part of the participative process. The output was determined by the ideas of participants, who in best case also became responsible for the realization. The workshop series was accompanied by an *online discussion forum* that allowed the participation of additional stakeholders, and their suggestions and questions have been considered in the following workshop. The fact that stakeholders were asked to be responsible for the outcome of projects was considered as key mechanism in order to create ownership and ensure follow-up activities. Degree of involvement: stakeholder co-decision (workshops) and consultation (online discussion).
- *The ErKlim* Project conducted several *expert workshops*. This consultative process was moderated by professional facilitators with expertise in group dynamics. The expert groups identified conflicting points and created consensus on certain issues. The researchers did not aim at an integration of experts in decision-making processes because these processes encounter financial and time constraints. More participation needs more resources, i.e. the time of stakeholders, and the researchers feared that stakeholders' motivation to participate decreases. Degree of involvement: stakeholder consultation.
- *The Climate Mainstreaming project* conducted several *exclusive workshops with financial corporations*, where they jointly decided on the thematic focus of the planned survey as

well as the survey design and discussed research results and their dissemination. This close cooperation was considered as necessary for gaining confidentiality. Degree of involvement: Co-production.

2.2.5.2 KLIMZUG

Related to the degree to which decisions, made by stakeholders, affect the project content, we can find all degrees of stakeholder participation realized in the KLIMZUG projects so far: stakeholder communication, stakeholder consultation, stakeholder co-production and stakeholder co-decision. Although the degrees differ in the respective projects, all KLIMZUG projects reached a very high degree of participation.

- *Stakeholder communication*: The one-way flow of information, either from initiator to stakeholder or the other way round, was executed counterbalanced. On the one hand KLIMZUG researchers or consultants are providing input to inform and sensitize stakeholders. Accordingly, they are trying to raise the awareness of the public as well as of decision makers in business, policy and administration for climate change and adaptation needs. On the other hand, a lot of information has been directed from stakeholders to initiators by gathering stakeholder's local and context knowledge and information about specific issues of adaptation to climate change.
- *Stakeholder consultation.* In consultation processes the KLIMZUG projects received estimates and impulses from business, administration and other stakeholders concerning the feasibility of adaptation measures. In contrast to stakeholder communication, we find a two-way flow of information as the initiators consider the consultation results in following processes. The KLIMZUG programme has been explicitely designed to establish ongoing processes of exchange of knowledge and perspectives between scientists, decision makers and stakeholders.
- *Stakeholder co-production.* Many projects realized the degree of stakeholder co-production. Especially Dynaklim integrated stakeholders into the process of scenario development at the "Zukunftsworkshops". The workshop explicitly did not aim at only identifying stakeholder's knowledge but at co-developing scenarios of climate adaptation. Moreover, several projects integrated stakeholders to co-produce adaptation strategies and measures (for example KLIMZUG Nordhessen and RADOST) or adaptation "Leitbilder" (for example KLIMZUG Nord).
- *Stakeholder co-decision.* By integration stakeholders into project bodies and regional decision making processes, some KLIMZUG projects realize stakeholder co-decision. KLIMZUG Nord for example integrates stakeholders into their steering group.

So far, the following dialogue designs have been applied within the KLIMZUG projects:

- *Workshops*. This dialogue design was applied so far within KLIMZUG Nordhessen, REGKLAM, Dynaklim and KLIMZUG Nord. REGKLAM for example organized scenario-workshops while Dynaklim and KLIMZUG Nord conducted workshops especially for media representatives, giving advices concerning climate adaptation communication. On the one hand, *presentations* informed stakeholders about specific adaptation topics, the latter also being discussed in *podium discussions*. On the other hand stakeholders were asked to discuss specific questions concerning adaptation in small *working and focus groups*.

- *Online-Discourses*. This dialogue design was applied within KLIMZUG Nord. They realized a Demos Online-Discourse in 2010 regarding the topic of flooding, integrating a broad variety of stakeholders in a discussion about measures concerning flood risks (www.hochwassernord.de). 2844 Persons visited the platform in three weeks, formulating 485 contributions and measures.
- *Competition*. Nordwest2050 utilized a competition to involve stakeholders. The competition "Fit für den Klimawandel" aimed at identifying innovative adaptation technologies and measures in companies and publicized those to a general public.
- *Market Place*. On a market place, products, actions and project results were exhibited in form of thematic islands, aiming at an open dialogue of participants with the respective experts concerning research questions and implementation challenges, where both sides could bring in their knowledge and experience. This design was applied within KLIMZUG Nordhessen.
- *Local round tables* were applied within RADOST, which realized for example the "Arbeitstreffen Ökosystem Windpark" in 2010.
- *Stakeholderpanels* were applied within KLIMZUG Nord.

2.2.6 Outcomes and Experience

2.2.6.1 KLIMAZWEI

In general, stakeholders were considered as very important source of information; this has been proved by the practical experience in all projects. The dialogues helped to better support stakeholders' contribution for reaching project goals and ensure the project's real world impact. Sharing their practical experience with the research team was motivating for the researchers who in turn orientated their efforts towards the stakeholders' interests and ideas. In the following, main outcomes and experience are summarized.

Selection of stakeholders: One central perception was that the quality of output and follow-up activities strongly depends on the careful selection of the right stakeholders, their embedding in the region (i.e. networks) as well as the degree of participation. Key stakeholders (particularly in regions that are addressed by several projects at the same time) are frequently invited to participation events – therefore the suggestion comes up that the planning process for research and /or awareness raising projects should be well coordinated in order to avoid "overusing" of central stakeholders. A previous analysis of the "who is who" in the target region as well as the early cooperation with other projects with the same regional and / or thematic focus is advisable.

Initiate action on community level: The joint development of action concepts on community level, the inclusion of the examples and ideas of stakeholders as well as the ongoing exchange of experience are important success factors for a lasting sensitization and motivation of stakeholders (Klaranet, KWU). Moreover the inclusion and extension of existing structures and networks on local level is essential for stakeholders' identification with the research project and the realization of project goals (Klaranet, KWU, ErKlim, Kuntikum).

Hand over responsibility: In order to initiate own adaptation processes the cooperation should lead to autonomous projects which can be realized without external facilitating support.

Particularly the Klaranet project shows that the awareness for climate change adaptation has been raised, but particularly regarding the personal and financial input it is questionable whether a research project is the right format to initiate these processes. The delegation of responsibility and decisional power to the stakeholders are considered to be success factors for the regional acceptance of a project as well as continuing activities after the end of the project.

The right timing for the right questions: Bringing together climate change and adaptation communities was challenging and did not lead to the anticipated identification of success factors. The ErKlim project concluded that the knowledge was not adequately available, i.e. verified or widely accepted respectively still not existing for the case of adaptation, and that this important process needed more time. A central lesson learnt was that the timing of a project that is dependent on input from outside is decisive for its success.

2.2.6.2 KLIMZUG

The outcomes and experiences of the KLIMZUG attempts could not be evaluated so far since the projects will be working until 2014/2015. However, it can be noted that some projects highlighted from the beginning on that their success depends on the involvement of all relevant stakeholders (for example KLIMZUG Nord).

2.2.7 Follow-up Processes and Integration into Ongoing Adaptation Processes

2.2.7.1 KLIMAZWEI

The follow-up activities are as diverse as the analyzed projects. Besides the fact that most projects tried to get additional funding to continue their activities, some follow-up processes were identified:

The Climate Mainstreaming project fed its experience with stakeholder-based research and project management into several publications in order to make them available for others. They particularly highlighted the involvement of feedback loops into project work as well as work with stakeholders. The main follow-up activity was a “road show”, jointly conducted by the financial corporation and the researchers. The presentation of their joint research results evoked resonance on international level.

For the decision support systems (DSS WuK, LandCare 2020) the users’ profit depends on data quality which needs to be updated periodically – therefore further funding would be necessary, but is not given at the moment.

Klaranet was able to initiate a support infrastructure in one administrative district that allows further funding of local adaptation projects. Beside that the project underlines that the greatest challenge lies in the continuation of activities after project termination.

The KWU approach has been copied by other adaptation projects within the current BMBF program (KLIMZUG). There have also been several requests by ministries concerning idea and design. The project team has published a final report specifying success factors for the transfer of results dealing with the challenge of how to ensure continuity of activities after the end of the project (see Born et al. 2009, pp. 68-70).

2.2.7.2 KLIMZUG

The follow-up processes and the integration into ongoing adaptation processes of the KLIMZUG attempts could not be evaluated so far since the projects will be working until 2014/2015.

2.2.8 Conclusions

The review of participative approaches initiated by the Federal Ministry of Education and Research within the KLIMAZWEI program and within the KLIMZUG programme revealed science-based and policy-based approaches of involvement. Science-based approaches especially aimed at checking the social relevance of the research and at the popularization of research results, while policy-based approaches aimed at empowering stakeholders to further initiate adaptation activities on their own; this empowerment was supported by networking processes initiated within the projects. As the funding priority focused on the development of new regional adaptation strategies, the projects integrated especially regional and local stakeholders. As the KLIMZUG projects will be working until 2014/2015 only parts of the review points could be analysed so far.

KLIMAZWEI participatory approaches reached a mixed degree of participation, realizing particularly stakeholder consultation and co-decision. Co-decision was realized by integrating stakeholders in local and regional networking, planning and decision processes, using for example online discussion forums as platform for stakeholder suggestions and questions which were then considered in workshops. The fact that stakeholders were asked to be responsible for the outcome of projects was considered as key mechanism in order to create ownership and ensure follow-up activities. Co-decision was moreover realized by jointly organizing participatory events and jointly deciding about their thematic focus, and by involving stakeholders in the development of autonomous projects.

The realization of the co-decision degree, being accompanied by the perception of stakeholders as partners to whom responsibility and decisional power has to be delegated, can be named as important success factor regarding BMBF participatory events. However, challenges were posed by selecting key persons with multiplier functions for the projects. Another success factor for reaching a co-decision degree of participation and raising ownership among stakeholders was to integrate the same stakeholders in a series of events or to organize feedback loops between stakeholders and the research team.

Table 5: Sectors addressed in analyzed participatory approaches (BMBF)

Project	DAS Sectors												
	Human health	Building sector (incl. housing and real estate)	Water regime and management, costal and marine protection	Agriculture and Soil	Biological diversity (incl. nature conservation)	Forestry and forest management (incl. wood)	Energy industry	Financial services industry	Transport and transport infrastructure (incl. traffic)	Trade and Industry	Tourism industry	Cross-sectional topics	
												Spatial and regional planning	Civil protection
KLIMAZWEI													
Klaranet	x	x	x	x							x	x	
KWU				x							x	x	
ErKlim		x							x				
Mainstreaming of Climate Risks and Opportunities								x					
LandCaRe 2020				x	x							x	
DSS-WuK					x	x							
KUNTIKUM											x		
KLIMZUG													
Dynaklim	x	x	x					x				x	x
INKA BB	x		x	x	x	x					x	x	
KLIMZUG Nord		x	x	x	x	x	x		x	x		x	
KLIMZUG Nordhessen	x		x	x		x	x		x		x		
Nordwest2050	x	x	x	x	x		x		x			x	
RADOST			x	x	x		x				x		
REGKLAM	x	x	x	x	x	x	x					x	

Table 6: Actor groups addressed in analyzed participatory approaches (BMBF)

Project	Actor groups							
	Sciences and Research	Politics	Administration	Companies	Business Associations	Media/ Journalists	NGOs	Interested public and individuals
KLIMAZWEI								
Klaranet	x	x	x	x	x		x	x
KWU	x	x	x	x	x		x	
ErKlim	x	x	x	x			x	
Mainstreaming of Climate Risks and Opportunities	x				x		(x)	
LandCaRe 2020	x	x	x	x				
DSS-WuK	x							
KUNTIKUM	x			x				
KLIMZUG								
Dynaklim	x		x	x	x	x	x	x
INKA BB	x		x	x	x			x
KLIMZUG Nord	x		x	x	x			x
KLIMZUG Nordhessen	x	x	x	x			x	x
Nordwest2050	x		x	x	x	x	x	x
RADOST	x		x	x	x		x	
REGKLAM	x	x	x	x	x		x	x

2.3 Federal Ministry of Transport, Building and Urban Development (BMVBS) / Federal Institute for Research on Building, Urban Affairs and Spatial Development (BBSR)

The Federal Ministry of Transport, Building and Urban Development (BMVBS) and its 69 subordinate authorities are involved in the topic of adapting to climate change, in particular in four out of a total of 14 fields of action, notified by the German Adaptation Strategy (DAS):

- Building sector,
- Water regime, water management, coastal and marine protection,
- Transport and transport infrastructure,
- Cross-cutting themes: Spatial, regional and physical development planning.

In addition to that the BMVBS is active in further fields of action for adapting to climate change, for example financial services industry and trade and industry. The BMVBS and its subordinate authorities aim at:

- Improving the knowledge base of developments resulting from climate change and its impacts,
- Actively sharing information,
- Developing concepts and strategies,
- Realizing model projects,
- Deriving recommendations for action,
- Integrating adaptation needs into legal bases, standards and technical regulations and
- Adapting public infrastructure and properties to climate change.

Besides research programs, such as „Impacts of climate change on waterways and navigation – Searching for options of adaptation“(KLIWAS), the BMVBS finances, under the leadership of the Federal Institute for Research on Building, Urban Affairs and Spatial Development (BBSR), the research programs “Spatial Development Strategies for Climate Change” (KlimaMORO) and “Urban strategies and potentials to combat climate change” (KlimaExWoSt). These programs support application-oriented model projects and projects on adaptation to climate change in urban and regional development as well as housing construction.

In the first phase of the KlimaMORO-program, the development of regional mitigation and adaptation strategies was promoted in eight model regions in total. For a period of 18 months, the model projects focused on vertical and horizontal integration of climate change concerns, process organization, innovative adaptation in regional planning instruments and implementation of first adaptation measures. While the first phase of the KlimaMORO-program (2009-2011) was terminated successfully in spring 2011, all the other comprehensive and participative research projects of the BMVBS involved in climate change adaptation, such as KLIWAS (2009-2013) and KlimaExWoSt (2009-2012) are currently in progress. In the following section therefore only the participatory processes from the (already accomplished) KlimaMORO-projects are considered.

Table 7: Overview of analyzed BMVBS/BBSR projects

Projects	Central subject and purpose of stakeholder involvement
KlimaMORO model region Vorpommern	To identify regional vulnerabilities, to identify challenges and fields of action, to sensitize local and regional planning authorities, to empower and enhance formal and informal instruments of spatial planning, to develop adaptation strategies, to identify the further need of research.
KlimaMORO model region Havelland-Fläming	To identify challenges and fields of action, to sensitize local and regional planning authorities, to raise awareness and to sensitize for the need of action, to develop adaptation measures, to support regional and local capacity to act.
KlimaMORO model region Westsachsen	To identify regional vulnerabilities, to identify challenges and fields of action, to sensitize local and regional planning authorities, to empower and enhance formal and informal instruments of spatial planning, to develop and test adaptation measures, to support regional and local capacity to act, to build up and enhance regional networks.
KlimaMORO model region Oberes Elbtal / Osterzgebirge	To identify regional vulnerabilities, to sensitize local and regional planning authorities, to empower and enhance formal and informal instruments of spatial planning, to develop adaptation strategies, to develop and test adaptation measures.
KlimaMORO model region Mittel- und Südhessen	To identify regional vulnerabilities, to sensitize local and regional planning authorities, to empower and enhance formal and informal instruments of spatial planning, to develop adaptation strategies, to develop approaches to risk management.
KlimaMORO model region Mittlerer Oberrhein / Nordschwarzwald	To identify challenges and fields of action, to sensitize local and regional planning authorities, to empower and enhance formal and informal instruments of spatial planning, to support regional and local capacity to act, to build up and enhance regional networks.
KlimaMORO model region Region Stuttgart	To identify regional vulnerabilities, to identify challenges and fields of action, to sensitize local and regional planning authorities, to develop adaptation strategies, to develop and test adaptation measures, to build up and enhance regional networks, to spread research results, to identify and avoid conflicting activities.
KlimaMORO model region Kreis Neumarkt i.d. Oberpfalz	To identify regional vulnerabilities, to identify challenges and fields of action, to sensitize local and regional planning authorities, to raise awareness and to sensitize for the need of action, to develop, test and implement adaptation activities, to build up and enhance regional networks.

2.3.1 Institutional Setting

The model projects strongly focused on the dovetailing of formal government and informal, cooperative governance structures. In the model regions, the regional planning authorities took the lead in the project, except in the Neumarkt/Oberpfalz administrative district, where municipal planning authorities took over the project management. The management tasks were, among other things, the moderation and coordination of the networks as well as public relations work.

Regional research assistance, consisting of one to three university and non-university research or consulting organizations, assisted the project management in its tasks. In addition to supporting the organization of regional processes, for example, the pre- and post-processing of events and surveys, the research assistance developed, among other things, technical bases and offered scientific consulting.

The regional planning office normally worked within a project group in cooperation with the regional research assistance, some municipalities and important sectoral planning authorities. These project groups were specifically founded for the model projects to evaluate scientific principles, content priorities and recommendations for action plans.

The involvement of other stakeholders in the model projects was effected by organizing working groups, workshops and conferences. In some model regions care was taken to separate pure specialized events, which offered a protective ambience for open discussion among experts, and official information meetings with political committees and the general public to explain the objectives and results of the model project.

2.3.2 Objectives

Initially, every model region aimed at acquiring practical, contextual and local knowledge. At the same time the model projects were used for generating scientific knowledge, especially about regional implementations and consequences of climate change and about participatory processes. This comprised elements of science-based approaches. Besides this, the participation of regional stakeholders aimed at increasing awareness on the issue of climate change. In addition to that it had been aspired to establish networks. Finally, the early incorporation of stakeholders was designed also to increase the cooperativeness and the acceptance of implementing adaptation measures and strategies. So in every model region we found participation approaches which were policy-based. In summary, the objectives of the policy-based stakeholder involvement were:

- Information exchange,
- Education and sensitization,
- Creating support and acceptance for adaptation needs.

The selection of the eight model regions was based on the aim to involve regions which have high specific vulnerability and, when possible, to simultaneously be able to represent all relevant vulnerabilities in Germany. Furthermore, the chosen measures and approaches should:

- Contain a clear link to formal and informal regional planning instruments,

- Show innovative elements such as the use of opportunities provided by climate change or synergies with climate protection measures and
- Show a regional and supra-regional significance, and provide transferable results to other regions.

With regard to the size of their territory, population, population density, economic development and natural characteristics the model regions differ strongly from each other and in part there are significant differences within each region. However, they all had in common the experience of meteorological extremes like windstorms, floods, droughts and heat waves within the last ten years.

2.3.3 Central Adaptation Problems Addressed

Climate change causes a variety of potential impacts. Most model projects focused on the analysis of four to six central climate change impacts. The selection of the analyzed problems was based on the regional vulnerability to hazards of climate change. The primary focus was on the problems which were already apparent. Almost all regions had already experienced an increase in:

- Heavy precipitation,
- Floods,
- Heat waves,
- Droughts.

Moreover the following sectors and areas from the German Adaptation Strategy have been addressed within the majority of the model projects (see Table 8):

- Human health,
- Water management,
- Biological diversity,
- Agriculture,
- Forestry and forest management,
- Tourism industry,
- Cross-sectional topics: Spatial planning and civil protection.

Some model projects addressed further fields of action such as energy industry, building and construction, or transport.

2.3.4 Stakeholders Involved

Many stakeholders were involved in the demonstration projects. These were mainly stakeholders from the local and regional administrations but also authorities of the Federal State and in the case of the Western Pomerania region, foreign partners (Poland). Above all, authorities for

- Environmental, nature and climate protection,

- Agriculture and forestry,
- Building regulations,
- Urban planning and development as well as
- Economic promotion

were involved (see Table 9).

2.3.5 Dialogue Design and Degree of Participation

The projects applied the following dialogue designs:

Thematic working groups. In five of the eight model regions stakeholder integration was achieved, among other things, by establishing one to four thematic working groups. The task of the working groups was to determine regional vulnerabilities to climate change, to develop adaptation strategies geared to these and to propose first adaptation measures. Most of the working groups came together between two and five times.

Public and non-public workshops. Additional to, or instead of the working groups, public and non-public workshops and bilateral consultation meetings with stakeholder groups were carried out in some model regions.

Written or oral expert surveys. In at least two regions written or oral expert surveys were conducted. The aim of these surveys was to determine the current and expected impacts of climate change and to collect ideas for adaptation measures.

Besides that, all demonstration projects used the internet as a medium to inform about objectives, contents and results of the project and to announce events. Additionally, some regions also used flyers and press releases to pass on project information. Furthermore, members of the regional project groups were in contact with other adaptation projects and made use of their events as external platforms to pass on information about the project and to interact with other experts.

The applied participation formats primarily served to increase stakeholders' awareness by information processing, hence realizing only the lowest degree of participation: stakeholder communication. Stakeholders were also involved in order to obtain and integrate their local and sectoral knowledge, e.g. in assessing local vulnerability. Furthermore, stakeholders made recommendations during the workshops regarding the account for missing data and they discussed the necessity and possibilities for modifications of the project design; this can be described as co-production. The results from the workshops were incorporated into the work of the project groups so that we can find a degree of stakeholder consultation realized. However, decisions were only made by the project groups which also took final responsibilities about design and results so that no degree of co-decision was realized.

2.3.6 Outcomes and Experience

Some model regions used KlimaMORO to systematically handle the subject of climate change adaptation for the first time. The projects have been set up in regions where stakeholder networks did not exist before. With the help of the stakeholders' detailed statements of regional and sectoral vulnerability could be made. In addition, recommendations for action

and adaptation strategies could be identified by stakeholder dialogues. Also, first adaptation measures have been implemented as pilot projects.

Existing networks in the regions have proved to be very useful for integrating stakeholders in the model projects. Local key persons, such as district administrators and mayors could also act as supporters and door-openers to integrate stakeholders in the model projects. In particular, stakeholders of the sectoral planning authorities were very interested in participating in the model projects. Difficulties were experienced in some regions with involving local and regional print and broadcasting media, who have often shown little interest in the subject of climate change adaptation. Some model projects explained their wish to get more support by the Länder authorities.

The transdisciplinary composition of the project and working groups with representatives from science, public administration and business has proven to be very useful in the successful handling of the complex and highly uncertain subject of climate change adaptation. However, these heterogeneous stakeholder constellations do also require a clear and comprehensive wording suitable for all participants.

Working groups and workshops should be thematically and physiographically homogeneous, so that a uniform awareness of problems and sufficient intersections can develop among the participants. It has proven to be particularly motivational for the stakeholders to

- Formulate, visualize and locate problems and aims as concrete as possible,
- Identify synergy potentials between the stakeholders,
- Understand climate change also as a chance,
- Point out the added value of adaptation measures and
- Give participants the feeling that they can achieve something.

2.3.7 Follow-up Processes and Integration into Ongoing Adaptation Processes

The BMVBS and the BBSR currently support the model regions in a second phase to refine and extend the initial developments.

In this second phase the model regions still see mobilization and awareness-raising of stakeholders and civil society as one of their important tasks for a fairly long period of time. In this context, the implementation of pilot projects is particularly important. These are not only able to attract attention, but also to generate a learning culture.

Similarly, stakeholder networks are key elements in the continuation of regional adaptation processes. Therefore, most of the regions intend to stabilize these networks and to establish new ones where they do not exist until now. With respect to adaptation, some regions intend to organize workshops or annual project and workgroup meetings. These events should be used for discussions about new findings in the area of climate change and regional vulnerabilities and they should be used for updating and editing adaptation strategies and recommendations for action. Any difficulties in implementation could also be discussed and solved at these meetings.

2.3.8 Conclusions

In the reviewed BMVBS/BBSR KlimaMoro-projects, stakeholder participation was realized within eight model regions based on the aim to involve regions which are facing high specific vulnerabilities and, as far as possible, to simultaneously be able to represent all relevant vulnerabilities in Germany. With regard to their orientation and objective of stakeholder involvement the participation approaches were predominantly policy-based approaches; however some science-based approaches were used to acquire local knowledge. To develop, form and concretize their policies, regional planning authorities aimed primarily at an information exchange with stakeholders to acquire practical, contextual and local knowledge. By conducting workshops and working groups which were characterized by a one-way flow of information, only serving to increase stakeholder's awareness by information proceeding or to request stakeholder's local and sectoral knowledge, the degree of stakeholder communication was reached. Moreover, in some workshops stakeholders recommendations were developed and discussed, hence realizing the degree of stakeholder consultation. Through thematic working groups stakeholders were integrated in regional vulnerability analysis, which is an example of stakeholder co-production. As the latter was rather infrequent, only a low degree of participation could be realized.

An important success factor for BMVBS participatory approaches was the transdisciplinary composition of the project and working groups with representatives from science, public administration and business which has proven to be very useful in the successful handling of the complex and highly uncertain subject of climate change adaptation. Moreover local key persons acted as supporters and door-openers to integrate stakeholders in the model projects. Challenges were posed by the heterogeneity of stakeholders that made communication difficult and required a clear and comprehensive wording, understandable to all participants. Moreover it was difficult to involve local and regional print and broadcasting media, who have shown little interest in the subject of climate change adaptation. From the KlimaMoro experience success factors for the motivation of stakeholders could be identified: concrete problem formulation, identification of synergies between stakeholders, illustration of adaptation measure's added value, the feeling that participants can achieve something.

Table 8: Sectors addressed in analyzed participatory approaches (BMVBS/BBSR)

Project	DAS Sectors												
	Human health	Building sector (incl. housing and real estate)	Water regime and management, costal and marine protection	Agriculture and Soil	Biological diversity incl. nature conservation)	Forestry and forest management (incl. wood)	Energy industry	Financial services industry	Transport and transport infrastructure (incl. traffic)	Trade and Industry	Tourism industry	Cross-sectional topics	
												Spatial and regional planning	Civil protection
KlimaMORO model region Vorpommern			x	x	x	x	x		x		x	x	
KlimaMORO model region Havelland-Fläming	x		x	x		x						x	x
KlimaMORO model region Westsachsen			x	x	x	x						x	
KlimaMORO model region Oberes Elbtal / Osterzgebirge	x		x	x	x	x			x		x	x	x
KlimaMORO model region Mittel- und Südhessen	x		x		x							x	x
KlimaMORO model region Mittlerer Oberrhein / Nordschwarzwald				x	x	x					x	x	x
KlimaMORO model region Region Stuttgart	x		x	x	x	x						x	
KlimaMORO model region Kreis Neumarkt i.d. Oberpfalz	x	x		x	x	x	x				x	x	

Table 9: Actor groups addressed in analyzed participatory approaches (BMVBS/BBSR)

Project	Actor groups							
	Sciences and Research	Politics	Administration	Companies	Business Associations	Media/ Journalists	NGOs	Interested public and individuals
KlimaMORO model region Vorpommern	x	x	x	x	x	x	x	x
KlimaMORO model region Havelland-Fläming	x	x	x		x	x		
KlimaMORO model region Westsachsen	x		x		x	x	x	
KlimaMORO model region Oberes Elbtal / Osterzgebirge	x	x	x		x	x		
KlimaMORO model region Mittel- und Südhessen	x		x			x	x	
KlimaMORO model region Mittlerer Oberrhein / Nordschwarzwald	x	x	x		x	x		x
KlimaMORO model region Region Stuttgart	x		x		x	x	x	
KlimaMORO model region Kreis Neumarkt i.d. Oberpfalz	x	x	x	x	x	x	x	x

3 Lessons Learnt: Summary of Results and Experience

3.1 Stakeholder Integration in the German Adaptation process

3.1.1 Results and Experience

Climate change has impacts on all parts of society and its impacts strongly vary in different regions. The responsibility for adaptation and options for action are hence widely distributed – among different political levels and between different parts of society. Thus, successful adaptation needs coordination and communication among actors. The German Federal Ministry for the Environment (BMU) took the initiative to develop the German National Adaptation Strategy and the Adaptation Action Plan, and a broad range of other organizations have been involved in this process. Openness and cooperation is one major principle in the Adaptation Strategy and in this context broad and diversified stakeholder integration processes have been realized.

Other federal ministries, as well as administrative and research institutions have supported the process of fuelling stakeholder commitment towards adaptation. Apart from BMU's and the Federal Environment Agency's (UBA) own dialogue activities a considerable number of research projects with strong participatory elements played an important role in spreading the news and inspiring appropriate responses to climate change challenges. The bulk of funding for adaptation research was provided by the Federal Ministry for Education and Research (BMBF). The Federal Ministry for the Environment initiated specially tailored projects for stakeholder involvement and established an information and exchange platform on adaptation questions, approaches and best practice examples (KomPass: www.anpassung.net).

It has been recognized by the research community that addressing societal challenges such as climate change cannot be based on "pure science" research projects without stakeholder participation and real world implications. This insight is also mirrored in the BMBF calls (KLIMAZWEI and KLIMZUG) and BMBF's expectation on research designs in the large research programs dealing with climate change adaptation. Transdisciplinarity has become a dominating concept for research on adaptation issues. The call for initiating participation processes in the course of research projects obviously is an expression of the funding agencies' intention to ensure that research does not end up on book shelves or in desk drawers.

During the last years numerous participation events on the national, regional and local level have been organized - and their number is increasing. Initiators are either public authorities, such as BMU or UBA, or research organizations. These events have covered all sectors addressed in the German Adaptation Strategy, however with different intensity (see **Fehler! Verweisquelle konnte nicht gefunden werden.**). More than 2,000 people from administration, research and business have participated in these events; Table 11 gives an overview on how intensely different actor groups were involved by the different programs or federal ministries. The total number of participants is difficult to estimate because a core group of stakeholders (especially from research and partly from administration) took part in many different events.

Table 10: Main sectors addressed in analyzed participatory approaches

Programs and responsible organizations	DAS Sectors												
	Human health	Building sector (incl. housing and real estate)	Water regime and management, costal and marine protection	Agriculture and Soil	Biological diversity (incl. nature conservation)	Forestry and forest management (incl. wood)	Energy industry	Financial services industry	Transport and transport infrastructure (incl. traffic)	Trade and Industry	Tourism industry	Cross-sectional topics	
												Spatial and regional planning	Civil protection
BMU/UBA – Events & projects	+	o	++	+	+	+	+	o	+	o	o	+	+
BMBF - KLIMAZWEI	-	o	-	o	o	-	-	-	-	-	o	o	-
BMBF - KLIMZUG	+	+	++	++	+	+	+	-	o	-	o	+	-
BMVBS/BBSR - KlimaMORO	+	-	++	++	++	++	o	-	o	-	+	++	+

Table 11: Main actor groups addressed in analyzed participatory approaches

Programs and responsible organizations	Actor groups							
	Sciences and Research	Politics	Administration	Companies	Business Associations	Media/ Journalists	NGOs	Interested public and individuals
BMU/UBA – Events & projects	++	-	++	+	++	-	+	-
BMBF - KLIMAZWEI	++	+	+	+	o	o	+	-
BMBF - KLIMZUG	++	o	++	++	++	o	+	++
BMVBS/BBSR - KlimaMORO	++	+	++	o	++	++	+	o

DAS sectors/actor groups addressed in ... of analyzed projects.

++ more than 75%

+ more than 50% but less than 75%

o more than 25% but less than 50%

- less than 25%

The participation activities involve both policy-based and science-based approaches. While the first aim at checking social relevance of research results and at deepening the understanding through integration of local and context-specific knowledge, the latter target at developing or improving policies and at creating support for policies (cf. Welp et al. 2006). Moreover, we found different degrees of participation: while most stakeholder integration activities pursued stakeholder communication and stakeholder consultation approaches, others reached high degrees of participation and integrated stakeholders in knowledge production (co-production) or decision-making (co-decision). The latter form was however rather seldom. The analysis shows that depending on the participation objectives, different participation degrees are valuable and useful for national and regional adaptation processes.

3.1.2 Blind Spots and Recommendations for the German Adaptation Process

Shortcomings and blind spots of the participation processes do still exist. While some topics (e.g. water, agriculture, biodiversity) are broadly represented other sectors and areas addressed in the German Adaptation Strategy have been covered by only a few events. Although the German Adaptation Strategy describes private companies as important actors in implementing adaptation measures, economic topics and challenges were clearly underrepresented in the participation events (exceptions are the thematic Stakeholder Dialogues with several dialogues addressing sector specific challenges and opportunities, activities within the KLIMZUG projects, or the BMU Regional Conferences). The DAS sectors “trade and industry” and “financial service industry” have only been addressed in a minority of stakeholder activities.

Concurrently, some actor groups can be identified that have been poorly involved so far. It is striking that politicians have almost not been engaged in dialogue processes on the national level and that their participation on the regional level is also low in comparison to other actor groups. The political sphere is mostly represented by representatives of administrations; this proves that adaptation is still not high on the political agenda or not controversial enough. However, a higher involvement of politicians could raise the public awareness on climate change adaptation and hence serve as an incentive to get engaged with adaptation for other poorly represented groups, such as NGOs, business and media.

Despite some positive experience it regularly proves to be very difficult to catch the interest of private companies and corporate decision makers from the senior management level. Industry representatives are busy and follow strict prioritization rules – leaving long term problems with a high level of uncertainty at the very bottom of their corporate and personal agenda. Triggering a higher level of attention and participation from this side is only possible if the project or public institution is able to supply relevant, interesting and reliable information. Moreover, industry representatives might be interested if climate change topics are embedded in broader economic topics and challenges such as risk management and dealing with different corporate risks (supply chain risks, risks of resource scarcity, reputation risks), cost-benefit analyses of adaptation measures or potential opportunities and innovation potentials related to adaptation.

A core group of stakeholders (from research and administration) has been involved in many different participation events organized by different organizations. Researchers and public institutions should take care not to over-stress key stakeholders in the attempt to involve all relevant stakeholders in every process. If several research projects and administrative initiatives

are being active in the same region or in the same sector, exchange and cooperation between these projects should be granted to avoid annoyance of stakeholders and to take full advantage of possible synergies between complementary approaches. Moreover, it is important that key stakeholders are not getting tired of discussing the same topics in different settings. Those stakeholders who have already been involved for longer times need advanced discussions; this has for instance been realized by the thematic working groups in KlimaMORO.

With the current trend of transdisciplinary research programs on climate change researchers and funding agencies should keep in mind that transdisciplinarity cannot replace politics and cannot take the responsibility for initiating and implementing political processes. In some cases scientists involved in adaptation research projects criticized that they did not see their role in initiating and facilitating political processes but in creating and providing scientific knowledge to inform those processes. Here, researchers should clearly define – for themselves, for funding agencies and for participating stakeholders - whether they pursue science-based or policy-based participatory approaches in their research projects. Policy-based participatory approaches aim at impacts on policies (or the agenda of other actors such as companies or NGOs) and researchers should ensure that their research project is able to make an impact, e.g. through cooperating with local policy and decision-makers. The analysis has shown that several research projects in the KLIMAZWEI and KLIMZUG programs and almost all KlimaMORO model projects aimed at policy-based approaches. Some KLIMAZWEI and KlimaMORO projects actually influenced the development of local or regional adaptation policies; the KLIMZUG projects' impact cannot be judged yet, since the projects are running until 2014/15.

It is not always easy to share responsibility between science and politics, i.e. to find the right balance between making sure that science is providing practically relevant findings that leave real world impacts also after the projects' finalization and the policy-makers or administrative task of initiating political and administrative processes to adequately deal with adaptation problems. Researchers should be encouraged to think about their impacts on society, about follow-up processes that do not dry out immediately after the termination of project funding and to be aware of ongoing political processes and existing institutions that are concerned with the questions dealt with in the course of the project. Stakeholder processes accompanying the research process are therefore crucial to interlink science and society – which proves to be particularly useful in the case of climate change challenges.

Another challenge lies in achieving adequate media coverage of research results in general and adaptation challenges in particular. Where is the news? That very common question from journalists should not provoke scientists to dramatize their results or to disregard the uncertainties involved in their statements. On the other hand they should think about how to refine their research results in a way that is interesting and instructive for the broader public. Otherwise their research results will remain widely ignored – which would not only be frustrating for the scientists, but also dangerous for society. Establishing cooperation with the regional media and/or incorporating a subproject on public relations could help to bridge that potential gap.

3.2 Recommendations for Stakeholder Participation in Adaptation Policies

From the German experience some general recommendations for initiating and conducting stakeholder participation in adaptation policies can be drawn.

Adaptation to climate change is a knowledge intensive topic that involves many cross-cutting issues, addresses different political or administrative levels and needs shared responsibilities and coordinated action between different regional and sectoral actors. Participatory approaches are hence important building blocks of adaptation policies, and both science-based and policy-based approaches can support the development and implementation of adaptation policies.

Generating and disseminating scientific information (and data) about the possible effects of climate change on national and regional scale are important first steps. The communication of scientific results on vulnerabilities and potential adaptation measures helps to sensitize stakeholders and to raise awareness. But information on its own does not automatically trigger adequate action. Therefore additional efforts are necessary to broaden the discussion and to stimulate innovative ideas and real world initiatives towards an active adaptation to climate change.

Generally it is necessary to coordinate actions towards adaptation between stakeholders and public institutions involved. That is not an easy task. National platforms like “KomPass” by the German Federal Environment Agency (UBA) or regional working groups on climate change are vitally important to initiate successful and durable processes beyond short-term projects or single meetings.

Dependent on the goals of participation different types of stakeholders should be involved and different designs used. Based on the reviewed experience and drawing on insights from Welp et al. (2006) and Hage & Leroy (2008b) Table 12 gives an overview on different approaches to stakeholder participation in adaptation science and politics.

As has been shown by the analysis, the different degrees of participation are valuable in the adaptation process. It is however important to be clear about the degree that is aimed at (see Table 12) and to communicate this to stakeholders in order to avoid false expectations about stakeholders’ impact on the adaptation process.

Additionally, some recommendations for planning and conducting stakeholder participation events or processes can be given:

3.2.1 Preparation and Planning

- *Start with defining the goals:* The first step is defining the goals to be achieved with the participation process. Depending on the goals stakeholders and methods can be chosen. Table 12 can support these decisions.

Table 12: Overview of different participation approaches in adaptation policy and research

Degree of participation	Approach	Objectives	Type of stakeholders	Experience/ know-ledge of stakeholders	Methods	Example(s)
Co-decision	Policy-based	Joint development of adaptation strategies, action plans and measures	Experts from politics, administration, business, NGOs and research	Expert knowledge on local/ sectoral vulnerabilities, local (supportive/ constraining) framing conditions and potential adaptation measures	Scenario workshops; workshop series integrated in the strategy development process	Klaranet thematic groups and regional panels; KWU workshop series
	Science-based	Increasing social relevance of research results	Experts from politics, administration, business, NGOs	Expert knowledge on local/ sectoral vulnerabilities, local framing conditions and potentials for action	Stakeholders as members of steering committees	KLIMZUG Nord steering group with stakeholders
Co-production	Policy-based	Evidence-based policy making, integrating scientific knowledge in policy process	Researchers, policy makers, administration	Scientific knowledge, expert knowledge on climate change impacts, vulnerabilities and potential adaptation measures	Expert hearings; study commission	--
	Science-based	Deepening scientific understanding; combining knowledge bases; dealing with uncertainty and value conflicts	Experts from regional/local politics and administration, business, NGOs	Expert knowledge on local/ sectoral vulnerabilities, local framing conditions and potentials for action	Interactive scenario development; interactive vulnerability assessment; group model building; workshop series integrated in the research process	Dynaklim scenario workshops (Zukunftsworkshops); thematic working groups on vulnerability in KlimaMORO projects (e.g. model region Stuttgart; model region Vorpommern)
Consultation	Policy-based	Creating support and acceptance for adaptation policies; recommendations for developing adaptation policies and measures	Decision makers from politics, administration, business and NGOs; researchers	Knowledge on local framing conditions and potential adaptation measures	Open space; world café; workshops	World café discussions in BMU/UBA Thematic Stakeholder Dialogues; BMU Regional Conference

Degree of participation	Approach	Objectives	Type of stakeholders	Experience/ know-ledge of stakeholders	Methods	Example(s)
Consultation	Science-based	Checking social relevance and applicability of research results	Decision makers from politics, administration, business and NGOs	Knowledge on local framing conditions and potentials for action	Workshops to review and discuss project designs, research questions and conclusions; focus groups; Delphi method	Open Space at BMU/UBA Symposium on Research Needs; Dynaklim expert Delphi
Communication	Policy-based	Sensitization, awareness rising on climate impacts and action needs	Broad public or decision makers from politics, administration, business and NGOs	No prior knowledge on climate change and adaptation needed	Websites; newsletters; presentation, panels discussions	KomPass website; KomPass Newsletter; "Tatenbank" video clips
		Collecting local measures and examples	Experts from politics, administration, business and NGOs	Experience with adaptation challenges and measures	Competitions; (online) surveys;	"Tatenbank" competition and data base on adaptation measures; questionnaires on DAS at the BMU/UBA National Stakeholder Dialogues
	Science-based	Gain access to local knowledge and data on climate impacts and adaptation; combining knowledge bases	Decision makers from politics, administration, business and NGOs	Experience with adaptation challenges and measures	(Online) surveys; interviews	Expert surveys in KlimaMORO projects (e.g. model region Neumarkt)
		Diffusion of research results	Broad public or predefined target groups	No prior knowledge on climate change and adaptation needed	Project websites; newsletter; presentations; panel discussions; Web2.0 tools	Project websites of KLIMZUG projects

- *Select stakeholders carefully:* Especially if dialogue processes aim at triggering follow-up activities among the stakeholders, it is important to identify in advance multipliers and stakeholders that could take the responsibility for follow-up processes. Integrating these key stakeholders (e.g. a sector association, a relevant public authority or research institution) already in the planning phase of stakeholder participation processes helps to increase their commitment to and their ownership of the process.
- *Decide on whether a single or a series of events is appropriate:* If participation processes aim at influencing policy development (stakeholder co-decision) or the research agenda and results (stakeholder co-production) key stakeholders should be involved in a series of events over a longer period that allows feedback loops between the participation and the policy or research process. If the goal is to sensitize and raise awareness (policy-based stakeholder communication or consultation) or to gain input in a research process (science-based stakeholder communication or consultation), a single event might be sufficient.
- *Coordinate with other participatory activities:* If several projects organize participation activities in the same region or in the same sector, exchange and cooperation between these projects should be granted to avoid annoyance of stakeholders and to take full advantage of possible synergies between complementary approaches.
- *Adapt the content to stakeholders' prior knowledge and experience:* If participants are not familiar with climate change adaptation, the event should include a presentation and discussion on vulnerability and core challenges for the region or sector. Moreover, adaptation measures or good practice examples should be presented in order to give participants ideas how to address the problem. Concurrently, it is important that those stakeholders who have already been involved for longer times need advanced discussions.
- *Prepare introductory material:* Depending on the goals it might be helpful to provide participants with introductory material (e.g. an overview on sectoral or regional vulnerability and possible adaptation measures) in advance (e.g. if stakeholders are involved who have not worked on adaptation challenges before). With this material stakeholders can prepare for the event and deal with adaptation topics over a longer period. Moreover, they can share this material with colleagues and help to spread adaptation-related information within their organization.

3.2.2 Conducting a Participation Event or a Series of Events

- *Be clear about objectives and manage expectations:* The events' objectives should be clearly communicated in the beginning. Additionally, expectations from participants should be collected and compared to the goals.
- *Use different methods:* In order to sustain participants' attention a mix of discussion methods (presentations, group discussions (plenary and small groups)) should be applied. It can also be helpful to use a mix of structured discussion with predefined questions or tasks and open discussions. This combination helps to focus on those topics the initiator wants to deal with while leaving participants the possibility to bring in their own priorities.

- *Provide a platform for exchange of experience:* The exchange of experience with other participants in similar situations helps stakeholders to develop strategies for their own work or organization. The exchange of experience can be supported through presentations and discussions with good practice examples. Moreover, participation events should offer space for informal contacts and discussions (e.g. in coffee breaks or through integrating open discussion formats like open space).
- *Support influence on the policy/research process:* If stakeholders are involved in a series of events, they should feel that the discussion makes progress, that the discussions have an impact on the policy or research process and that they gain new insights from repeated participation. A close link between the participation process and the political process can increase the impact; this can be reached if the initiator is a key actor in the policy process or if decision makers are involved as participants.
- *Create ownership:* If participation events aim at follow-up activities among the participants, the discussion process should collect and develop possible follow-up activities within the event(s) and try to identify or define responsible actors among the participants. Being involved in the development of ideas and initiatives increases the intrinsic motivation and sense of personal responsibility. This can also be supported by involving key stakeholders in the preparation phase (see above).

3.2.3 Documentation and Follow-up

- *Document results:* Documenting discussion results and using them as input into following events can support advancements in discussions. This moreover helps the participants to distribute the results in their organizations or to integrate ideas and suggestions from discussions into their own work on adaptation.
- *Publish the results:* Publishing the documentation of participation events and their results can moreover help to inform and sensitize other actors in the same sector or region (for instance, the documentations of the BMU/UBA thematic stakeholder dialogues are published on the website www.anpassung.net (in German)). Participants should have the possibility to comment on the documentation before it is published; this increases their trust in the process and may support an open discussion. However, if participants are opposed to publication and if the discussion deals with confidential information, the documentation should only be distributed among participants.
- *Inform participants about the impact:* It can be useful to inform participants (between or after the events) how insights from the participatory event/process have been fed into the adaptation policy or research process. This gives participants the impression that they are taken seriously and motivates them to further participation.

4 References

Arnstein, Sherry (1969): A ladder of citizen participation. Journal of the American Institute of Planners 35: 216–224.

Ashford, Nicholas; Rest, Kathleen; Chapa, Lupita (1999): Public Participation in Contaminated Communities. Center for Technology, Policy, and Industrial Development. Massachusetts Institute of Technology, Cambridge, Massachusetts.

Born, Manfred; Dr. Heidorn, Fritz; Lieberum, Andreas; Dr. Nibbe, Joachim; Winkelseth, Claudia (2009): Abschlussbericht KLIMAWANDEL UNTERWESER – Mit dem Klimawandel handeln! http://www.klimawandel-unterweser.ecolo-bremen.de/index.php?obj=file&aid=13&id=126&unid=5b7f6c94da7704001531cc2e90b741c5 (accessed: July 26th, 2012).

Bundesregierung (2005): Nationales Klimaschutzprogramm 2005. Sechster Bericht der Interministeriellen Arbeitsgruppe CO2-Reduktion.

Collins, Kevin & Ison, Ray (2009): Jumping off Arnstein's Latter: Social Learning as a New Policy Paradigm for Climate Change Adaptation. In: Environmental Policy and Governance 19, 358-373.

Conde, Cecilia & Lonsdale, Kate (2005): Engaging stakeholders in the adaptation process. In B. Lim, E. Spanger-Sigfried, I. Burton, E. Malone, & S. Huq (eds.), Adaptation Policy Frameworks for Climate Change (pp. 47-66). Cambridge, UK: Cambridge University Press.

Duraiappah, Anantha Kumar; Roddy, Pumulo; Parry, Jo-Ellen (2005): Have Participatory Approaches Increased Capabilities? International Institute for Sustainable Development (IISD), Canada.

European Environment Agency (2008): Impacts of Europe's changing climate — 2008 indicator-based assessment. EEA Report, No 4/2008, EEA, Copenhagen.

Fiorino, D. J. (1990): Citizen participation and environmental risk: A survey of institutional mechanisms. Science, Technology & Human Values. 15 (2). S. 226-243.

Forrester, J. (1999): The logistics of public participation in environmental assessments. International Journal of Environment and Pollution. 11 (3). S. 316-330.

Gardner, J, Dowd, A-M., Mason, C. and Ashworth, P. (2009). *A framework for stakeholder engagement on climate adaptation*. CSIRO Climate Adaptation Flagship Working paper No. 3. http://www.csiro.au/resources/CAF-working-papers.html.

German Federal Cabinet (2011): Adaptation Action Plan of the German Strategy for Adaptation to Climate Change. http://www.bmu.de/files/pdfs/allgemein/application/pdf/aktionsplan_anpassung_klimawandel_en_bf.pdf (accessed: July 26th, 2012).

Green, Abigale & Hunton-Clarke, Lynsey (2003): A typology of stakeholder participation for company environmental decision-making. Business Strategy and the Environment 12, 292-299.

Hage, Maria & Leroy, Pieter (2008a): Stakeholder Participation: Guidance for the Netherlands Environmental Assessment Agency: Main Document. Bilthoven, NL: Netherlands Environmental Assessment Agency.

Hage, Maria & Leroy, Pieter (2008b): Stakeholder Participation: Guidance for the Netherlands Environmental Assessment Agency: Practice Guide. Bilthoven, NL: Netherlands Environmental Assessment Agency.

Hage, Maria; Leroy, Pieter; Petersen, Arthur (2010): Stakeholder participation in environmental knowledge production. Futures 42, 254 – 264.

Hemmati, Minu (2002): Multi-stakeholder Processes for Governance and Sustainability, London: Earthscan.

Hoffmann, Esther; Gebauer, Jana; Dunkelberg, Elisa; Hirschfeld, Jesko; Hirschl, Bernd; Rotter, Maja; Stegnitz, Antje; Wurbs, Sven; Lotz, Wiebke; Welp, Martin (2011): Stakeholder Dialoge: Chancen und Risiken des Klimawandels. Climate Change 03/2011. Dessau-Roßlau: Umweltbundesamt.

Hoffmann, Esther; Siebenhüner, Bernd; Beschorner, Thomas & Arnold, Marlen (2007): Gesellschaftliches Lernen und Nachhaltigkeit. Zur Einführung. In: Hoffmann, Esther; Siebenhüner, Bernd; Beschorner, Thomas; Arnold, Marlen; Behrens, Torsten; Barth, Volker; Vogelpohl, Karin (Hrsg.): Gesellschaftliches Lernen und Nachhaltigkeit. Marburg. Metropolis. 11-32.

Intergovernmental Panel on Climate Change (IPCC) (2007): Fourth Assessments Report (2007) - Climate Change 2007: Impacts, Adaptation and Vulnerability. Cambridge University Press http://www.ipcc.ch/publications_and_data/publications_ipcc_fourth_assessment_report_wg2_report_impacts_adaptation_and_vulnerability.htm

Intergovernmental Panel on Climate Change (IPCC) (2012): Special Report (2012) - Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation. Cambridge University Press. http://www.ipcc-wg2.gov/SREX/images/uploads/SREX-All_FINAL.pdf

Pretty, Jules (1994): Typology of Community Participation. In: Bass, S./Dalal-Clayton, B./ Pretty, J.: Participation in Strategies for Sustainable Development. London: Environmental Planning Group, International Institute for Environment and Development.

Pognos AG (2011): Enbericht - Evaluierung möglicher Anpassungsmaßnahmen in den Sektoren Energie, Industrie, Mittelstand und Tourismus vor dem Hintergrund der Erarbeitung eines „Aktionsplans Anpassung“ der Bundesregierung. Bundesmininsterium für Wirtschaft und Technologie.

Rowe, Gene & Frewer, Lynn (2005): A typology of public engagement mechanisms, in: Science, Technology, & Human Values, 30 (2), 251 – 290.

Stecker, Rebecca; Mohns, Till; Eisenack, Klaus (2012): Anpassung an den Klimawandel – Agenda Setting und Politikintegration in Deutschland. Zeitschrift für Umweltpolitik & Umweltrecht 2/2012, 179-208.

The Federal Government (2008): German Strategy for Adaptation to Climate Change. http://www.bmu.de/files/english/pdf/application/pdf/das_gesamt_en_bf.pdf (accessed: July 26th, 2012).

United Nations Framework Convention on Climate Change (1992). http://unfccc.int/resource/docs/convkp/conveng.pdf (accessed: August 3rd ,2012)

Webler, T. & Renn, O. (1995): A Brief Primer on Participation: Philosophy and Practice. In: Webler, T., Renn, O. & Wiedemann, P. (Hrsg., 1995): Fairness and Competence in Citizen Participation. Dodrecht. Kluwer. S. 17-33.

Welp, Martin; Vega-Leinert, Anne de la; Stoll-Kleemann, Susanne; Jaeger, Carlo (2005): Science-based stakeholder dialogues: Theories and tools. In: Global Environmental Change 16, 170-181.

5 ANNEX

Further information and reading:

5.1 BMU / UBA participation events and projects

Participation Events	Link
National Stakeholder Workshop I, II, III, IV (2005-2010) (Workshop Reports, German)	http://www.anpassung.net/veranstaltungen
BMU Expert – Workshop (2008) (German)	http://www.wasklim.de/BMU-Konferenz.htm
Symposium: Prioritization of Research Needs (2008) (Documentation, German)	http://www.anpassung.net/veranstaltungen http://www2.ufz.de/index.php?de=16735
National Conference (2009) (Overview, German)	http://www.anpassung.net/veranstaltungen http://www.wasklim.de/BMU-Konferenz.htm
Workshop-Discussion with Municipalities (2009) (Summary, German)	http://www.anpassung.net/cln_108/nn_701074/DE/Anpassungsstrategie/Veranstaltungen/090519_20BMU_20KommunalWS/090519__node.html?__nnn=true
Departmental Research Conferences (2009,2010) (Documentations, German)	http://www.anpassung.net/veranstaltungen
Regional Conference: Adaptation in Coastal Zones (2011) (Documentation, German)	http://www.anpassung.net/cln_108/nn_2140378/SharedDocs/Downloads/DE/Dokumentation_20Regionlakonferenz_20norddeutsche_20L_C3_A4nder.html
Research/ Consultancy Projects	**Link**
Information-, Communication and Cooperation System for the German Adaptation Strategy (2008-2009) (Research Report, German) (Final Report, German) (Final Report, English)	http://www.umweltbundesamt.de/uba-info-medien/mysql_medien.php?anfrage=Kennummer&Suchwort=3919 http://www.umweltdaten.de/publikationen/fpdf-l/3919.pdf http://www.umweltdaten.de/publikationen/fpdf-l/4031.pdf
Research/ Consultancy Projects	**Link**
Series of Thematic Stakeholder Dialogues: Risks and opportunities of Climate Change (2009 – 2010) (Final Report, German) (Online Documentation of Dialogues, German)	http://ccsl.iccip.net/4071.pdf http://www.anpassung.net/dialog
Development of an Indicator Concept for the German Strategy on Adaptation to Climate Change (2008-2010) (Final Report, English)	http://www.umweltdaten.de/publikationen/fpdf-l/4031.pdf

"Tatenbank" Evaluation of Adaptation Projects: Assessment and reward of realized Adaptation Projects and Measures (Overview, German) (Videos, German)	http://www.tatenbank.anpassung.net/ http://ecologic.eu/3810 http://www.tatenbank.anpassung.net/Tatenbank/DE/3_Wettbewerb/wettbewerb_node.html http://www.youtube.com/watch?v=AwkY27HzV7Q http://www.youtube.com/watch?v=sf9lDrPryOQ http://www.youtube.com/watch?v=oHmFfqG88DU http://www.youtube.com/watch?v=_CQOjKdvYs0
BOKLIM - Application of Soil Data in Climate Adaption (Final Report, German)	http://www.boklim.de/boklimPublic/index.html http://www.umweltdaten.de/publikationen/fpdf-l/4187.pdf
Group Delphi Water Management (Evaluation, German)	http://www.wasklim.de/Delphi.htm http://www.wasklim.de/download/WASKlim_Delphi_Bericht.pdf

5.2 BMBF programs and projects

Programs	Link
KLIMZUG (Climate change in the regions) (Web site, German)	http://www.klimzug.de/en/index.php
KLIMAZWEI (Climate protection and adaptation) (Web site, German)	http://www.klimazwei.de/tabid/36/Default.aspx
KLIMZUG projects	**Link**
Dynaklim (Website, German)	http://www.Dynaklim.de/
INKA BB (Website, German, English)	http://www.inka-bb.de/
KLIMZUG-Nord (Website, German, English)	http://klimzug-nord.de/
KLIMZUG-Nordhessen (Website, German, English)	http://www.klimzug-nordhessen.de/
Nordwest2050 (Website, German)	http://www.Nordwest2050.de/index_nw2050.php
RADOST (Website, German, English)	http://www.klimzug-radost.de/
REGKLAM (Website, German, English)	http://www.regklam.de/
KLIMAZWEI projects	**Link**
Klaranet (Website, German)	http://www.klara-net.de/
ErKlim (Website, German)	http://www.erklim.de/
KWU (Website, German)	http://www.klimawandel-unterweser.ecolo-bremen.de/
Climate Mainstreaming (Website, English)	http://www.germanwatch.org/climain/english.htm
LandCaRe 2020 (Website, English)	http://www.landcare2020.de/xist4c/web/Home--EN-_id_12737_.htm
DSS WuK (Website, German)	http://www.dss-wuk.de/
Kuntikum (Website, German)	http://www.klimatrends.de/

5.3 BMVBS programs and projects

Programs	Link
KlimaMORO (Spatial Development Strategies for Climate Change) (Website, German)	http://www.klimamoro.de/
KLIWAS (Impacts of climate change on waterways and navigation Searching for options of adaptation) (Website, German, English)	http://www.kliwas.de/
KlimaExWoSt (Urban strategies and potentials to combat climte change (Website, German, English)	http://www.klimaexwost.de/
Projects	**Link**
KlimaMORO model region Vorpommern (Website, German)	http://www.klimamoro.de/index.php?id=21
KlimaMORO model region Havelland-Fläming (Website, German)	http://www.klimamoro.de/index.php?id=22
KlimaMORO model region Westsachsen (Website, German)	http://www.klimamoro.de/index.php?id=24
KlimaMORO model region Oberes Elbtal / Osterzgebirge (Website, German)	http://www.klimamoro.de/index.php?id=25
KlimaMORO model region Mittel- und Südhessen (Website, German)	http://www.klimamoro.de/index.php?id=26
Projects	**Link**
KlimaMORO model region Region Stuttgart (Website, German)	http://www.klimamoro.de/index.php?id=28
KlimaMORO model region Kreis Neumarkt i.d. Oberpfalz (Website, German)	http://www.klimamoro.de/index.php?id=29