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Framing adaptation to climate change – a challenge for building institutions

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Contents

Abbreviations

Summary	1
1 Introduction	3
2 Framing discourses and institutions	4
3 Concepts of adaptation in the UNFCCC	7
3.1 Negotiating adaptation	8
3.1.1 Adaptation versus mitigation	8
3.1.2 Adaptation framed by climate change definitions	10
3.1.3 Adaptation to response measures	12
3.1.4 Adaptation as compensation	13
3.2 Funding adaptation	14
3.2.1 Guiding GEF Trust Fund activities and eligibility criteria	15
3.2.2 Guidance on the Least Developed Countries Fund and Special Climate Change Fund	17
3.2.3 The Adaptation Fund under the Kyoto Protocol	18
4 Adaptation in the scientific discourse	20
4.1 The evolution of conceptual thinking in adaptation research	20
4.2 Characteristics of adaptation	24
4.3 Conceptualizing adaptation for cost calculation	26
5 Addressing adaptation in development policy and practice	27
5.1 Framing adaptation for action	29
5.2 Differentiating development and adaptation	32
6 Institutional challenges in targeting adaptation	33
7 Conclusions	36
Bibliography	39

Tables

Table 1:	Funding adaptation under the UNFCCC	19
Table 2:	Common attributes and characteristics of adaptation	26
Table 3:	Evolution of references to adaptation or mitigation in selected PRSPs	28
Table 4:	Entry points for adaptation and examples	32

Figures

Figure 1:	Adaptation to climate change and variability	24
Figure 2:	Characterization of entry points of adaptation projects (referred to here as “cases”)	30
Figure 3:	The strategic interface between areas of development cooperation and adaptation	31
Figure 4:	Core characteristics of adaptation	34
Figure 5:	Institutional frame for adaptation to climate change	35

Boxes

Box 1:	“Additional costs” of adaptation funded by the LDCF	18
Box 2:	Adaptation as a “wicked problem”	33

Abbreviations

ADAPT	Assessment and Design for Adaptation to Climate Change
AOSIS	Alliance of Small Island States
CER	Certified emission reductions
CDM	Clean Development Mechanism
COP	Conference of the Parties
CRISTAL	Community Risk Screening tool – Adaptation and Livelihoods
CRM	Climate risk management
GEF	Global Environment Facility
IPCC	Intergovernmental Panel on Climate Change
LDCF	Least Developed Countries Fund
LEG	Least developed country expert group
NAPA	National Adaptation Programmes of Action
ODA	Official development assistance
OECD	Organisation for Economic Cooperation and Development
OPEC	Organization of the Petroleum Exporting Countries
PRSP	Poverty Reduction Strategy Paper
SBSTA	Subsidiary Body on Scientific and Technological Advice
SCCF	Special Climate Change Fund
UNFCCC	United Nations Framework Convention on Climate Change

Summary

Adaptation to climate change has long been neglected in climate and development policy and there is an institutional deficit in addressing adaptation action. The United Nations Framework Convention on Climate Change (UNFCCC) has yet to develop coherent institutional structures that facilitate the effective implementation of adaptation and related commitments in a way that is at once catalytic and synergetic at the global level. The question of how to respond adequately to the requirements of adaptation to climate change is still an open one and a matter of controversy in discussions, also with regard to a follow-up agreement for the Kyoto Protocol.

One of the related challenges, in UNFCCC negotiations but also in development policy and practice, is the definition of a conceptual basis for adaptation from which to derive action. The question of how adaptation is conceptualized is crucial for leveraging action and addressing adaptation across different scales, from the global to the local level. This applies not only for the United Nations Framework Convention but also for institution building in a wider sense. It forms the basis for adaptation strategies, implementation, the calculation of adaptation costs and financial needs or translates into eligibility criteria for funding. Especially, the funding mechanisms of the climate convention, the connecting link between the global and the national or local level, assume an important position here. Their institutional arrangement and conceptual basis can influence action on adaptation on a broad scale.

While the concept and problem definition of mitigation is relatively clearly framed with regard to cause and effect, the conceptual frame of adaptation remains vague and has changed over time. Adaptation was initially conceptualized from an environmental and climate change perspective focusing on impacts of climate change. It is now increasingly seen from a development perspective emphasizing development needs and aspects of vulnerability to current climate variability. Each perspective emphasizes a different type of policy response. Three fora are relevant for the evolution of conceptual thinking on adaptation to climate change: the UNFCCC, scientific discourse and development policy and practice. Adaptation has been framed differently in each of these. Nevertheless, there are core characteristics of adaptation that emerge from these discourses. They are represented by the following questions:

- Adaptation to what? (climate-related stimuli)
- Who or what adapts? (characteristics of system)
- How does adaptation occur? (attributes, forms, types of adaptation)
- On what time scale and on what spatial scale is adaptation being addressed? (time/space scale)
- Who defines adaptation how and why? (power, processes, decision criteria, information)
- How to address uncertainty and responsibility in adaptation?

The last three aspects of adaptation have until now not received sufficient attention in defining adaptation options, and they are challenging for institution building:

- The definition of time scales of adaptation needs careful balancing between short- and

long-term requirements, development needs and climatic trends. To what time scale of climatic trends should adaptation measures respond and within what time frame can they be considered as climate change adaptation measures?

- The question of “who defines, how and why?” is an important parameter in targeting adaptation as there is no concept-inherent, pre-given definition of a problem of and hence solution for adaptation. This implies that the challenge for adaptation planning and addressing it in institutions lies in the definition of the problem itself. What are the processes, criteria and information on which a decision is based? As there are no common, “objective” criteria of what “good” or “bad” adaptation to climate change is, the decision criteria for adaptation measures need to be socially embedded.
- Uncertainty is a dominant feature of adaptation in a twofold sense. On the one hand, impacts of climate change are uncertain and there will be no definite information on what needs to be adapted to. On the other hand, there is a degree of uncertainty with regard to the determinants of vulnerability and there is no guarantee that certain measures will lead to reduced vulnerability or enhanced adaptive capacity. Both aspects of uncertainty imply the risk of maladaptation or maladaptedness. What is the best way to address the question of responsibility if adaptation fails?

In view of the core characteristics of adaptation, what are the implications for a future adaptation framework under the UNFCCC? Addressing adaptation relates to a reframing of the effects of climate change that can be addressed under the convention and to whether this includes climate variability. The parties to the convention should reconsider the conceptual frame of adaptation funding and adopt a representative governance structure. The adaptation framework should adopt a process-oriented approach to adaptation that includes climate variability, and it should strengthen the generation of context-specific information and analysis. At present, uncertainty and responsibility are not addressed sufficiently under the convention.

1 Introduction

From the beginning, international negotiations within the United Nations Framework Convention on Climate Change (UNFCCC) have focused on mitigation, the reduction of greenhouse gas emissions to prevent dangerous climate change. Since the Third Assessment Report by the Intergovernmental Panel on Climate Change (IPCC) established that anthropogenic greenhouse gas emissions have an influence on climate change and that some impacts can no longer be avoided, the academic and political attention devoted to adaptation to climate change has grown (e. g. Pachauri 2004). The publication of the IPCC's Fourth Assessment Report has made the need for adaptation even more apparent, increasing the pressure to address the issue in international climate-change and development policy. While adaptation to climate change is not an alternative to mitigation, it does represent a necessary policy objective which can no longer be ignored. It was long neglected in policy as well as in research (see e. g. Adger 2001, 924). Accordingly, there is an institutional deficit in addressing adaptation action, and the international climate regime has yet to develop coherent institutional structures and detailed rules to ensure an effective implementation of commitments to adaptation (Verheyen 2002, 142).

At the UNFCCC conference in 2007 in Bali, Indonesia, the parties adopted the Bali Action Plan, in which adaptation plays a prominent role. The Bali Action Plan charts the course for the ongoing negotiation process, which is intended to lead to a follow-up agreement for the Kyoto Protocol and which sets the stage for the "full, effective and sustained implementation of the convention through long-term cooperative action, now, up to and beyond 2012" (Decision 1/CP.13, FCCC/CP/2007/6/Add.1). The aim is to reach an agreed outcome and decision at the end of 2009 in Copenhagen, Denmark. Next to mitigation, technology transfer and financing, adaptation is one of the main topics on the agenda of the negotiation process. The parties recognize the need for enhanced action in this field and the important role it plays in tackling the problem of climate change and in coming to an agreement in 2009.

However, the issue of how to address adaptation adequately and how the UNFCCC, as a multilateral agreement, can assume a catalytic role in promoting adaptation action is still controversial in discussions. One of the related difficulties is the conceptual basis of adaptation to be used to derive action and financial transfers. Neither the convention nor the Kyoto Protocol defines adaptation explicitly, and there is more than one view of what adaptation means within the convention text itself. At the same time, the question of how adaptation is framed is crucial for leveraging action and addressing adaptation across different scales, from the global to the local level. This applies not only for the UNFCCC context but also for institution building in a wider sense. The way adaptation is framed forms the basis for implementation, political strategies, the calculation of adaptation costs and financial needs, and it translates, for example, into eligibility criteria for funding. Especially, the funding mechanisms of the climate convention, the connecting link between the global and the national or local level, take on an important position. Their institutional arrangement and conceptual basis can influence action on adaptation on a broad scale.

While the concept and problem definition of mitigation is relatively clearly framed with regard to cause and effect, the conceptual frame of adaptation remains vague. It has changed over time not only in the climate negotiation process but also in science and de-

velopment policy and practice, which have influenced the UNFCCC to a certain extent. Among the main drivers in changing the frame and problem definition of adaptation are scientific progress, risk perception and practical considerations bearing on implementation.

Based on the approach of framing (Chapter 2), the present study investigates how adaptation is conceptualized and how these concepts have evolved in the UNFCCC process and its financial institutions (Chapter 3), the scientific discourse (Chapter 4) and in development policy and practice (Chapter 5). Drawing on these frames of adaptation, the study analyzes core characteristics of adaptation that can be regarded as a kind of “minimum” or “basic” frame irrespective of geographic or political context and scale. Based on these conceptual deliberations, it examines what the implications and challenges are for building institutions (Chapter 6) and suggests elements that the UNFCCC and its funding mechanisms should consider in their adaptation framework (Conclusions).

2 Framing discourses and institutions

Regimes¹ like the UNFCCC and related institutions emerge in response to a need to solve problems. As far as the concrete arrangements of these institutions are concerned, it is important to consider the perspectives of all stakeholders involved with the problem or risk at stake (see e. g. Adams / Thompson 2002 v). However, perceptions of the nature or character of the problem to be solved often diverge among stakeholders (Young 1998, 268; see also Carr / Mpande 1996, 144). Agreement on a shared definition of the problem among the stakeholders involved is therefore a crucial starting point to leverage action. Such a definition can be negotiated within *frames*. Scholars differ in their definition of *frame* and related processes (*framing*). It is an important concept in the study of negotiations and can be seen, for example, as a concept for communication, as an interpretative schema and as a way in which negotiators conceive the scope and definition of and the relationship between issues in negotiations. It also serves for deciphering how past experiences influence bargaining (Putnam / Holmer 1992, 129, 150; quoting Bacharach / Lawler 1981 et al.). The rhetorical frame of equity, for example, is prominent in the climate change debate or the assessments presented by the Intergovernmental Panel on Climate Change (IPCC), which have since become the “operational centre” for the development and dissemination of action frames on global climate change (Ogunseitan 2003, 105, 107).

In its broadest sense, framing is a sense-making device used to establish the parameters of a problem and to construct meaning or make sense of a situation (Putnam / Holmer 1992, 128; Gray 1996, 576). In this study, framing refers to the issue development approach rooted in the literature on dispute resolution, argumentation and policy deliberations, as described by Putnam and Holmer (1992, 138–141). An issue corresponds to topics of concern in disputes. Within the UNFCCC, adaptation as a response to climate change is one of the major agenda issues in negotiations. Such an issue is not an objective agenda item but represents the way people define or conceptualize an issue or ascribe meaning to it. It is embedded in a context as well as in a process of framing and reframing which deter-

1 “Regimes are social institutions that define practices, assign roles and guide the interaction of occupants of such roles within given issue areas” (Verheyen 2002, 129, citing Young 1994, 3).

mine the importance and relevance of available arguments. Arguments are the bargaining tool used to define significance, stability of the problem as well as workability of solutions to an issue. They aim at furthering strategies for problem solving. Reframing represents more than a shift in the nuance of understanding. It challenges the problem perception of an issue or demonstrates the ineffectiveness of another existing frame. A framework such as that of the convention on climate change can be understood as the outcome of such a framing process, and it forms the basic conceptual structure of an issue.

The importance of framing for building institutions and channelling action is shown, for example, by Ogunseitan (2003). In his study he illustrates the ways in which institutional action frames can influence assessments of vulnerability in Africa and that an effective frame translation from global concerns to local relevance can be constrained by such frames when financial arrangements require an endorsement of problem definitions and methodological approaches.² There is a danger of uncritical adjustment of national priorities with a view to gaining international financial support (Ogunseitan 2003, 107–109). With his example he supports the observation of Young and other scholars who highlight the risk of setting up inefficient institutional structures in global environmental governance (Young 1998, 268). At the global level an adequate frame for action is especially important as its institutional arrangements serve to channel action of both their formal members and wider arrays of actors operating across different scales (Young 1998, 274). Institutions can be understood as rules that circumscribe action (Young 1998, 284), while frames are devices for defining a problem and possible solutions.

An analogy can be drawn between the Ogunseitan study and the UNFCCC, where adaptation to climate change is of high priority for most developing countries but represents an extra burden on their national budgets, and one caused mainly by industrialized countries. All the more important are, accordingly, the appropriate international framework for supporting action on adaptation in developing countries and the targeted transfer of financial resources in particular. Such a framework should embrace a concept of adaptation that matches the problem definition of all stakeholders involved while at the same time giving special consideration to developing countries' needs. In the convention this is covered by one of the central funding criteria circumscribed by the term "adequate adaptation". At present "adequate adaptation" is an open term whose interpretation depends on the particular country and situation concerned (Verheyen 2002, 138). At the global level there is no definition and conceptual basis of what "adequate adaptation" in fact is.

At the same time, the UNFCCC points to the catalytic and synergetic role of the convention and its financial mechanisms. The parties stress the strategic role of action under the convention and the cost effectiveness needed to ensure global benefits at the lowest possible cost (UNFCCC Article 3.3).³ They encourage multilateral bodies, the public and pri-

2 See also Adger et al., who argue that the political prescriptions that flow from global discourses are often inappropriate for local realities (Adger et al. 2001, 683), or Lindseth, who argues that the perception of climate change by local stakeholders is important in the process of planning adaptation (Lindseth 2005, 64), or Bauhr (2000) on the obstacles to creating a globally agreed perception of causes, consequences and measures

3 See also Decision 11/CP.1: "Consistency should be sought and maintained between activities (including those related to funding) relevant to climate change undertaken outside the framework of the financial mechanism and the policies, programme priorities and eligibility criteria for activities as relevant, established by the Conference of the Parties. Towards this end and in the context of Art. 11.5 of the

vate sectors and civil society to build on synergies among activities and processes, as a means to support adaptation in a coherent and integrated manner (Decision 1/CP.13, FCCC/CP/2007/6/Add.: 1.(c) (v)). The catalytic function of action on adaptation was reiterated in the Bali Action Plan.

This raises the question of what definition and concept of planned adaptation can be considered “adequate” while at the same time fulfilling a catalytic function in problem solving at the global level and giving due consideration to – or at least not conflicting with – the problem definition of adaptation and solutions envisaged in multiple national contexts. Accordingly, what, concretely, does the current frame of adaptation under the convention look like, and is it “adequate” as a response to the challenge of climate change and the needs of developing countries? What concepts of adaptation and problem definitions does it include? How did these concepts evolve in negotiations, in what context and based on what arguments? And how are these reflected in the institutional arrangements and financial mechanisms of the convention that, finally, leverage action at the national or local level?

The question of who defines is an important one in the process of framing and reframing. In the literature on cross-scale dynamics of implementing adaptation (e. g. Adger et al. 2004; Wilbanks 2002; Rotmans / Rothmann 2003), one of the major findings that the definition of which environmental issue is appropriately tackled at what scale and the question how an environmental governance problem is handled within a jurisdiction must be seen as a reflection of the strength of the interest and power of actors who define the problem (Adger / Arnell / Tompkins 2005, 80).⁴ With regard to the definition of adaptation to climate change, three broad groups of actors and discourses are relevant: the parties to the UNFCCC, the scientific community, first and foremost as channelled through the IPCC assessment reports, and finally development cooperation and policy. It is within these three fora that ongoing processes of framing and reframing take place. In this study, these are seen as processes that mutually influence one another according to a framework based on Mitchel et al. (2003). The framework describes the relationship between policy and science as a circular influence from science to policy making and from the political sphere back towards science and assessment (Siebenhüner 2003, 113).⁵ Developing countries are underrepresented in the political negotiation process as well as in the scientific process of the IPCC,⁶ and this limits, in a twofold way, their possibilities to influence the problem definition and resulting action frames. The question of power and possibilities to influence these processes, however, will not be at the centre of this study. It is in a way reflected in the different frames of adaptation. In this respect, this study rather analyzes to what extent the current UNFCCC frame of adaptation considers the problem definition of different negotiation groups.

Convention, the secretariat should collect information from multilateral and regional financial institutions on activities undertaken in implementation of Art. 4.1 and Art. 12 of the Convention.”

4 On the social construction of definitions, see also Carr / Mpande (1996, 143 f.).

5 See also Flyvbjerg, who argues that the “*she who has the power to decide what is legitimate science and fact also holds the planning power* (Lindseth 2005, 66 citing Flyvbjerg, 1998).

6 See, for example, the statement by the Subsidiary Body for Scientific and Technological Advice (SBSTA): “*It is also acknowledged that most adaptation research is carried out in industrialized countries, and that joint research and development with receiving countries may therefore be useful.*” (Mace 2006, 68 citing FCCC/SBSTA/2004/2, para. 40)

Among the three groups of actors, it was above all the UNFCCC discourse in which questions of social and economic impacts of climate change and related necessities of adaptation were initially considered and brought to public attention. Being the main global platform for finding solutions on global climate change, the UNFCCC has strongly influenced issue development on adaptation, including research agendas. The scientific community was relatively late in giving more room to questions of adaptation. The issue received virtually no attention in the first two assessment reports by the IPCC. The analysis of different adaptation concepts in this study will therefore start out with the UNFCCC, also so as to better capture the chronological development of the term adaptation. The study subsequently analyses concepts of adaptation in the scientific and development policy discourse. In addressing the question of what can be considered “adequate adaptation”, it identifies core characteristics that emerge from the process of framing in the three fora. Such a basic frame of adaptation can be considered to comprise the essential problem definition of various actors irrespective of scale and context, and it can therefore serve as a basic action frame for adaptation-related institution building.

3 Concepts of adaptation in the UNFCCC

The international legal framework on adaptation is poorly developed (Yamin / Depledge 2004, 213). Policy development on adaptation is impaired by a lack of agreement about the meaning, scope and timing of adaptation. Most of the adaptation commitments under the convention are referred to in Article 4 of the convention, and 4.8 and 4.9 are central in addressing adaptation “needs and concerns of developing country parties”. Article 4 sets forth specific commitments for all parties, including the formulation, implementation, publishing and update of national and as appropriate regional programmes that facilitate “adequate adaptation to climate change” (Art. 4[1]).

“Adequate adaptation” is an open term. Its interpretation is left to each party, as is the task of determining appropriate adaptation measures. According to Yamin and Depledge, “*the commitment in Article 4.1(b) does not mandate the pursuit of any particular adaptation policies by a Party. In that sense, it can be seen as a procedural commitment, albeit one that is highly significant because it leads to establishment of processes charged with the important function of identifying, implementing and assessing adaptation options*” (Yamin / Depledge 2004, 218). In this regard, the developed country parties included in Annex II of the convention commit to “provide new and additional financial resources” to developing countries for the implementation of their obligations, taking “into account the need for adequacy and predictability in the flow of funds” (Art. 4[3], 4[4]).⁷

The convention requires all parties to address adaptation in a precautionary and strategic way. It does not allow for autonomous adaptation but obliges the parties to adopt anticipatory and planned adaptation measures (Verheyen 2002, 131). These commitments on adaptation are based on principles laid down in the convention. Next to the principles addressing the specific needs of developing country parties (Art. 3.2) and the precautionary

7 COP-7 decisions reiterate that funding for developing countries should be “*additional, predictable and adequate*” (Verheyen 2002, 141). For a detailed discussion of commitments on adaptation under the convention, see Verheyen (2002); Mace (2003, 2006 and 2008) or Yamin / Depledge (2004).

principle (Art. 3.3), there are the principles of equity and common but differentiated responsibilities (Art. 3.1). These general principles shape and influence negotiations on how to frame adaptation.

The central link between the procedural commitment on adaptation, which assigns the definition of adaptation to the national level, and the global adaptation frame is the funding mechanisms. Their mandate for financing adaptation action depends on how adaptation is framed in international climate negotiations. The discourse on adaptation to climate change has evolved throughout the negotiation process, and the conceptual understanding of adaptation has developed along with it (Schipper 2006, 86).

3.1 Negotiating adaptation

As stated in the introduction, there is no explicit definition of the term “adaptation” within the UNFCCC or the Kyoto Protocol (Yamin / Depledge 2004, 214; Mace 2006, 55; see Article 1 UNFCCC). This already indicates that adaptation to climate change was not at the centre of interest during negotiations on the UNFCCC.

The convention framework must reconcile divergent interests of states that contribute to different degrees to climate change and are faced with different risks arising from global warming. There are, for example, major differences between oil producing countries that highlight their need to adapt to changing oil consumption (see 3.1.3), least developed countries that prioritise action on adaptation to the impacts of climate change or small island states that fear inundation by rising sea levels and whose adaptation possibilities are necessarily limited in scope. In consequence, there are different concepts of adaptation in the convention. From a broad perspective, the main difference in the conceptual approach to climate change, and the related issue of adaptation, is that developed countries tended to see climate change as an environmental issue whereas developing countries saw it as a development issue, although neither developing nor developed countries’ spoke with one voice (Bodansky 1993, 479).⁸ This controversy in conceptualizing solutions to climate change dominated the negotiation process and heavily influenced approaches to adaptation, a situation that has persisted until today. Within this broad discussion on mitigation versus adaptation, adaptation was framed by climate change definitions, as response measures and as means of compensation.

3.1.1 Adaptation versus mitigation

In finding solutions on how to respond to climate change, the dichotomy between the two approaches of mitigation, reduction of greenhouse gas emissions and adaptation, has long been the prominent feature in climate policy discourse, noted by negotiators, policy-makers and scholars (Schipper 2006, 82; Schipper 2004, 50; Pielke 1998, 160 ff.).⁹ Society’s concern about climate change originates in the latter’s expected impacts, and politics in

8 For further literature on perspectives from developing countries during the negotiation process leading to the UNFCCC agreement, see Bodansky (1993, footnote 178).

9 See also Oppenheimer / Petsonk (2004); Wilbanks et al. (2003); Verheyen (2002); Huq / Grubb (2003).

the 1990s and beyond has focused on climate protection in order to attack the root cause. *“The relationship between adaptation and mitigation is such that, in theory, the more mitigation that takes place, the less adaptation will be required, and vice versa”* (Schipper 2004, 50 citing Huq / Grubb 2003, see also Pielke 1998). Although the UNFCCC refers to mitigation and adaptation as two possible reactions to tackle the problem of climate change, the focus until now has been on reduction of greenhouse gas emissions as the main cause of anthropogenic climate change. Adaptation has, for a number of reasons, received much less attention than mitigation.

On the one hand, there was scientific uncertainty over whether climate change is in fact caused by human activity, and the impacts were considered as uncertain and associated with events taking place in the future.¹⁰ The scientific evidence changed with the publication of the second and following IPCC reports (see IPCC Assessment reports 2–4, and Klein 2003, 33). It was above all industrialized countries that pointed to the scientific uncertainties involved in downscaling and identifying impacts. They pointed to the risk of maladaptation and to difficulties in separating the effects of natural climate variability from anthropogenic climate change to justify postponing action on adaptation (Mace 2003, 4).

On the other hand, tactical considerations and the huge diversity of interests concerned influenced the framework on adaptation. The most important argument was that a focus on adaptation needs to be seen as an obstacle in building support for a mitigation framework. Dealing with adaptation in the negotiations would demonstrate a country’s lack of discipline when it came to emission reductions (Burton 1994, 14; Schipper 2006, 84). Furthermore, identifying adaptation options was for some parties tantamount to admitting that climate change was in fact occurring, a view which was not supported by the so-called ‘climate sceptics’ (Schipper 2006, 84), who questioned the human influence on climate change and thus the need for climate protection. Large developing country parties seemed to fear that substantial commitments on adaptation funding from their developed country partners would entail expectations regarding future commitments that might explain why some parties of the G-77 and China group did not actively seek progress on adaptation in negotiations (Mace 2003, 4).¹¹ The bloc of G-77 and China were struggling with various, also conflicting, interests and national circumstances that represented an obstacle for the evolution of an adaptation framework (see Chapter 3.1.3). Another obstacle was differences within the group in terms of bargaining power, negotiating skills, technical capacities and institutional and financial support that affected prioritisation of adaptation needs (Mace 2003, 4 f.). The weak framework on adaptation is also due to a weakness of the concept of adaptation that can be associated with passiveness, resignation and acceptance and stood in contrast to the strength of the word limitation, which was seen as active, combating and controlling (Burton 1994, 14).

10 See also the preamble of the Convention, which notes that “there are many uncertainties in predictions of climate change, particularly with regard to the timing, magnitude and regional patterns thereof.” (UNFCCC)

11 The G-77 and China is an intergovernmental group and was formed in the early 1960s in preparation for the 1964 U.N. Conference on Trade and Development. It originally had 77 member states; this number has meanwhile risen to 132. China is neither an associate nor a full member, but texts are typically introduced on its behalf as well (Bodansky 1993, 479, quoting Burns 1990; Yamin / Depledge 2004, 34 f.).

All in all, in the discussion over the best response strategy to climate change, reduction of anthropogenic greenhouse gas emissions, was and still is central in the UNFCCC. Climate protection remains the ultimate goal of the UNFCCC and the Kyoto Protocol, as stated in Article 2 of the convention:

“The ultimate objective of this convention and any related legal instruments that the Conference of the Parties may adopt is to achieve, in accordance with the relevant provisions of the Convention, stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous interference with the climate system. Such a level should be achieved within a time frame sufficient to allow ecosystems to adapt naturally to climate change, to ensure that food production is not threatened and to enable economic development to proceed in a sustainable manner.”

The need for adaptation referred to in the second sentence has been acknowledged by more and more parties and gained in importance. The discourse on mitigation can no longer be separated from adaptation, as can be seen from the Bali Action Plan. The process for mitigation in negotiations also depends on the process for adaptation and vice versa. A crucial linking element is the provision of financial resources for adaptation and possible new financing instruments related to the field of mitigation.

3.1.2 Adaptation framed by climate change definitions

The ultimate objective of the convention shows that adaptation is linked to mitigation policy within the UNFCCC. As there is no explicit definition of the term adaptation, adaptation can be understood as conceptually framed by climate change definitions (Mace 2006, 55). The convention defines “climate change” and “adverse effects of climate change”.

“Climate change” is defined as a “change of climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is in addition to natural climate variability observed over comparable time periods” (Art. 1.1). The definition of climate change in the convention is limited to anthropogenic climate change that has “*important implications for understanding ‘effects’ of climate change to be addressed by the convention process, and for determining the role of the convention process in fashioning an equitable response*” (Mace 2006, 55). The United States, for example, resisted any explicit reference to “insurance” in the Buenos Aires Decision 1/CP.10 because of the linkage it created between extreme weather events and climate change (Mace, 2006, 62; FCCC/CP/2004/10/Add.1). The concept of “adaptation to the effects of anthropogenic climate change” is also reflected in the financial mechanism of the convention (see Chapter 3.2.1). The restriction to human-induced climate change differs from the IPCC definition that refers to any change in climate over time, whether due to natural variability or as a result of human activity (IPCC 2001a, WGI, 2).¹²

12 “Climate change in IPCC usage refers to any change in climate over time, whether due to natural variability or as a result of human activity. This usage differs from that in the Framework Convention on Climate Change, where climate change refers to a change of climate that is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and that is in addition to natural climate variability observed over comparable time periods” (IPCC 2001a, WGI, 2).

“Adverse effects of climate change” are defined as “changes in the physical environment or biota resulting from climate change which have significant deleterious effects on the composition, resilience or productivity of natural and managed ecosystems or on the operation of socio-economic systems or on human health and welfare”. As Mace (2006, 55) notes, the breadth of the terms “composition”, “resilience” and “productivity” draw in a wide range of climate impacts to which adaptation efforts may theoretically be directed under the convention. But the definition also shows that adaptation is strongly related on the one hand to the impacts of climate change and on the other hand to ecosystem adaptation, a fact that shows the influence of the debate of the late 1980s, when thinking on adaptation was closely related to ecosystem adaptation (Schipper 2004, 57) and hence to autonomous adaptation.

Broadening the understanding of adaptation

The conceptualization of adaptation as a response to the impacts of anthropogenic climate change has broadened with the rise of adaptation on the policy agenda, foremost with the Marrakech Accords and their funding decisions (FCCC/CP/2001/13/Add.1), which will be analyzed in Chapter 3.2, the establishment of the Nairobi Work Programme and, finally, the Bali Action Plan.

The Nairobi Work Programme is a 5 year programme that was requested by the parties in 2003 (Decision 10/CP.9, FCCC/CP/2003/6/Add.1) and will be implemented from 2005 to 2010. Its objective is to assist all parties, particularly developing countries, “to improve their understanding and assessment of impacts, vulnerability and adaptation, and to make informed decisions on practical adaptation actions and measures to respond to climate change on a sound scientific, technical and socio-economic basis” (FCCC/SBSTA/2008/L.13/Rev.1). The programme takes into account not only future or anthropogenic climate change but also current climate variability, and it thus broadens the conceptual basis of adaptation activities. At COP 12 (Conference of the Parties) in 2005 in Montreal, the parties decided on nine thematic work areas which reflect this broader approach. On the one hand, this comprises activities closely related to impacts of climate change, such as climate modelling, scenarios and downscaling or data and observations. On the other hand, it contains activities that allow for a broader consideration of the developmental and socioeconomic context of adaptation measures, such as climate-related risks and extreme events, socioeconomic information or adaptation planning and practices.¹³

In this regard, the Nairobi Work Programme is seen by some as an important step in bringing forward adaptation action under the convention, but its institutional role is limited as the programme is part of the Subsidiary Body on Scientific and Technological Advice (SBSTA) and is set to end in 2010. The SBSTA is mandated by Article 9 of the Convention to provide the COP with information and advice, but it has no implementing authority. The Nairobi Work Programme therefore was criticized during negotiations by developing countries as of little use unless it was action-oriented and included pilot projects that could feed in recommendations to the Subsidiary Body for Implementation

¹³ For further information on the thematic areas and action-oriented sub-themes of the Nairobi Work Programme, see the annex to decision 2/CP.11 and conclusions of SB 25 (FCCC/SBSTA/2008/L.13/Rev.1). For a report on completed activities, see FCCC/SBSTA/2008/5 and FCCC/SBSTA/2008/MISC.3, and see Add.1–2 for views of the parties on further activities.

(SBI). Proponents of the programme see its merit in the ability to catalyze and coordinate concrete action on adaptation by parties, organizations and other stakeholders (Mace 2007).

Consideration of current climate change and/or climate variability for adaptation activities under the convention is also provided for in the Bali Action Plan. It includes enhanced action on risk management and risk reduction strategies, including insurance (1.(c)(ii)). But the Bali Action Plan also addresses adaptation detached from a perspective guided by climate change impacts, and coming from a development perspective, as it envisages support for climate-resilient development (see also Chapter 4). To what extent this will be considered in the elaboration of the adaptation framework of a post-2010 agreement still needs to be negotiated.

With regard to the implementation of an adaptation concept that is framed by climate change definitions, and regarding its scope within the convention, the question of “adapting to the effects of what, anthropogenic climate change, climate change or climate variability?” is important and needs to be clarified. This question in turn relates to the scientific understanding of climate change and whether or not current climate variability is already seen as part of climate change. The conceptual understanding of adaptation framed by climate change definitions is therefore also shaped by scientific knowledge and progress on the meaning and scope of the impacts of climate change.

Besides climate change-related concepts of adaptation, the convention addresses two further adaptation concepts: adaptation to response measures and adaptation as compensation.

3.1.3 Adaptation to response measures

Related to the question “adapting to the effects of what?” there is in the convention another concept of what adaptation means, although it is related to the cause of climate change and not its impacts, namely the concept of adaptation to response measures. Adaptation to response measures reflects the concern of oil producing countries in the UNFCCC that fear that their economies will be adversely affected by the reduction of greenhouse gas emissions. This is also referred to as “*impact of the implementation of response measures*” (see www.unfccc.int; Yamin / Depledge 2004, 247). It is covered under the same Article 4.8 as activities on adaptation in response to the adverse effects of climate change.¹⁴ This linkage of two completely different “adaptation” concepts in one article has been and still is problematic for the development of support for efforts to counter the adverse effects of climate change. OPEC (Organization of the Petroleum Exporting Countries) countries, however, have been successful in creating this procedural linkage, which means that progress on adaptation issues has consequently become conditional upon progress in the interests of oil producing countries (Yamin / Depledge 2004, 247 ff.; Schipper 2004, 62; Mace 2006, 58). Usually, oil producing countries have referred to adaptation to response measures as the need to diversify their economies. The need for economic diversification as an adaptation measure is increasingly also referred to as a re-

14 For a description of key actor groups involved in this issue, see Barnett / Dessai (2002).

sponse to the impacts of climate change by developing countries in general. This means that talking about “economic diversification” as a possible adaptation measure can be linked to two concepts of adaptation with regard to cause.

3.1.4 Adaptation as compensation

The negotiation process on adaptation has always been implicitly linked to the discussion on liability (Schipper 2006, 85). During negotiations leading to the UNFCCC, Germany, for example, “*proposed a protocol on the ‘adjustment to climate changes and the prevention and containment of climate related damage’*” (Verheyen 2002, 131). The Alliance of Small Island States (AOSIS)¹⁵ proposed that the convention “*establish an insurance fund that would provide compensation for damages suffered as a result of sea-level rise*” (Bodansky 1993, 528). The Bali Action Plan points to the concept of adaptation as compensation in a general way by referring to disaster reduction strategies and means “to address loss and damage associated with climate change impacts in developing countries that are particularly vulnerable to the adverse effects of climate change” (1/CP.13, FCCC/CP/2007/6/Add.1).

While the current climate change framework does not consider liability in a direct way, less explicit reference can be found in the convention text. In the preamble to the convention, the parties recall the ‘no-harm’ principle and the responsibility of states “to ensure that activities within their jurisdiction or control do not cause damage to the environment of other States or of areas beyond the limits of national jurisdiction”.¹⁶ As the impacts of climate change represent an additional burden on developing countries’ economies, this has always led to discussions on the extent to which payments for adaptation measures under the convention should be obligatory or can be seen as compensation for damages. The preamble is not legally binding for commitments under the convention and does not refer explicitly to developing countries (Verheyen 2002, 136). Also, financial transfers to developing countries in support of adaptation are, at present, voluntary in nature.

Nevertheless, some scholars see a significant change in the legal and political basis with regard to payments for adaptation. The background is the discussion on the ‘right to development’, which is still under discussion as a basis for mandatory development aid, although it is not accepted as a principle of international law (Verheyen 2002, 134 citing inter alia Chowdhury et al., 1992 for a deeper analysis). The climate regime, however, “*provides developing countries with a legal basis to claim funds from developed States for purposes defined in the Convention*” (Verheyen 2002, 134; see also Sands 1992, 274). These “purposes” and the question of who is entitled to claim what amount of funds for what and what the obligations for funding are are qualified by Article 4 of the convention

15 AOSIS “is a coalition of some 43 low-lying and small island countries, most of which are members of the G-77, that are particularly vulnerable to sea-level rise. AOSIS countries are united by the threat that climate change poses to their survival and frequently adopt a common stance in negotiations. They were the first to propose a draft text during the Kyoto Protocol negotiations calling for cuts in carbon dioxide emissions of 20 % from 1990 levels by 2005” (www.unfccc.int).

16 In the environmental field, the no-harm principle acquired legitimacy by being adopted in Article 21 of the Stockholm Declaration of the UN Conference on the Human Environment in 1972, and it was subsequently adopted as Principle 2 by the Rio Declaration on the Environment and Development (Gupta 2007, 76).

and subsequent guidance to the financial mechanism of the UNFCCC (see Chapter 3.2).¹⁷ The purpose of adaptation funding hence depends on the conceptual understanding of the scope and meaning of adaptation in the convention. The right to claim adaptation expenses is also qualified by the procedural requirement to “agree” on costs with the Global Environment Facility (GEF), the financial mechanism of the convention.

Linking the concept of adaptation to compensation claims is therefore closely associated with the question of who defines adaptation and who controls and owns the financial resources. Control over financial resources and the appropriate financial institution was already a matter of controversy in negotiations on Article 11, the financial mechanism of the convention, not only in terms of adaptation but also with respect to general support for mitigation measures. The G77 argued that providing financial assistance to developing countries that participate in efforts to curb climate change is an obligation, not charity, and that donor countries should not have a right to control the financial mechanism (Bodansky 1993, 538 f.). To what extent is this or one of the previously described adaptation concepts finally reflected in the current funding provisions?

3.2 Funding adaptation

Two broad categories of activities are eligible for funding for developing countries (non-Annex I countries) under the convention: the implementation of general commitments under the convention, such as national communication obligations (see Article 12.1), and the implementation of adaptation activities for the adverse effects of climate change and response measures as covered by Article 4.1 (Decision 11/CP.1, FCCC/CP/1995/7/Add.1).

For the implementation of general commitments under the convention, the developed countries listed in Annex II commit to provide new and additional financial resources to meet the “agreed full costs” of developing countries. For the implementation of adaptation measures to the adverse effects of climate change, developed countries commit to supply financial resources for the “agreed full incremental costs” (Article 4.3). “Agreed” refers to the agreement which has to be reached between a developing country party and the convention’s financial mechanism, a function assigned to the Global Environment Facility in 1992 (UNFCCC Art. 11; FCCC/SBI/2007/21; Mace 2006, 63).

As the financial mechanism, the GEF functions under the guidance of and is accountable to the Conference of the Parties, which decides on its policies, programme priorities and eligibility criteria in relation to the Convention (Art. 11.1). The guidance to the GEF and its eligibility criteria for funding should, therefore, reflect the decisions made by parties on adaptation action and the related conceptual deliberations on adaptation.¹⁸ Currently, the UNFCCC has “four windows” to address adaptation: the GEF Trust Fund, with its emphasis on global benefits and pursuing synergies (Waller-Hunter 2005, 1), the Least Developed Country Fund and the Special Climate Change Fund, which are under the

17 See Verheyen (2002) for a detailed discussion on Article 4.3 and 4.4, which qualify funding commitments, or Verheyen (2005).

18 This is e. g. reiterated in Decision 2/CP.4, recalling the operating principles of the GEF to maintain flexibility to respond to changing circumstances, including evolving guidance of the COP and experience gained from monitoring and evaluation activities.

which have significant adaptation components, and finally the Adaptation Fund under the Kyoto Protocol. The last three funds were adopted with the Marrakech Accords in 2001 (Decision 7/CP.7 and 10/CP.7, FCCC/CP/2001/13/Add.1).

3.2.1 Guiding GEF Trust Fund activities and eligibility criteria

At COP 1 in Berlin in 1995, the parties gave initial guidance to the Global Environment Facility (GEF) on adaptation activities eligible for funding as well as for programme priorities, adopting a “three-stage” approach for implementation. These three stages reflect short-, medium- and long-term strategies. Stage I consists of “planning, *which includes studies of possible impacts of climate change, to identify particularly vulnerable countries or regions and policy options for adaptation and appropriate capacity-building*” (Decisions 11./CP.1, FCCC/CP/1995/7/Add.1, 37, emphasis added).¹⁹ This can as well encompass the evaluation of policy options for adequate monitoring systems or response strategies in coastal zone management, disaster preparedness, agriculture, fisheries and forestry (see GEF 1995; Klein 2003, 38).

Building on work in Stage I and the particularly vulnerable countries or regions identified therein, Stage II will include further capacity building to prepare for adaptation in those countries and Stage III envisages actual “measures to facilitate adequate adaptation, including insurance” (as envisaged by Article 4.1(b) and 4.4; Decisions 11./CP.1, FCCC/CP/1995/7/Add.1: 37). The decision on starting Stage II and III activities depends on the outcome of Stage I as well on results from scientific and technical studies, such as those of the IPCC and any evidence of the adverse effects of climate change. In 1998, the parties gave the GEF a mandate for funding and implementation of Stage II activities as envisaged by Article 4.1(e), but no extra financial resources were provided for (Klein 2003, 39; Decision 2/CP.4, FCCC/CP/1998/16/Add.1). The decision comprises cooperation in preparing for adaptation to the impacts of climate change, the development and elaboration of appropriate and integrated plans for coastal zone management, water resources and agriculture, and for the protection and rehabilitation of areas, particularly in Africa, affected by drought, desertification and floods. Möhner and Klein (2007, 7) note critically that actual GEF funding practices have narrowed down the focus of possible adaptation funding to the mere financing of National Communications under Stages I and II.

From a conceptual perspective, guidance to the GEF focuses on adaptation options in response to and framed by climate change impacts. The need to start out with implementing activities beyond the stage of planning depends on the evidence of impacts. That Stage I activities start with planning was, inter alia, a reflection of scientific uncertainties prevailing at that time with regard to the impacts of climate change, especially on the regional level. Another basis for funding which applies to the implementation of Stage II and Article 4.1 activities is the GEF trust fund’s concept of “incremental costs” (see Art. 4.3).

“Incremental costs” are the difference between two costs that quantify the amount of the payment that developing countries will receive from developed countries “*as compensa-*

¹⁹ Activities under Stage I are also referred to as “enabling activities” such as capacity building and data collection and archiving (Decision 11/CP.2, FCCC/CP/1996/15/Add.1).

tion for acceding to, and implementing the terms of, international environmental agreements” (Jordan / Werksman 1994, 83 f.). In terms of adaptation funding under the GEF, “incremental costs” would determine the additional costs to maintain a system “climate-safe” based on a distinction between adaptation to a future, scenario-based climate change and adaptation to today’s climate variability (Klein 2003, 41 and 45).²⁰ The “incremental cost” concept can be ascribed to the fact that the UNFCCC applies only for anthropogenic climate change and that therefore only measures in response to climate change caused by human activity are eligible for funding (Verheyen 2002, 135). It is also linked to the concept of global public goods referred to in the principles of the convention stating that measures to deal with climate change should ensure global benefits.²¹

The concept of “incremental costs” and global benefits is extremely problematic in the context of adaptation funding. The need to adapt arises from a global cause, but adaptation activities have to be embedded in national and local contexts. It is difficult for developing countries to differentiate between a baseline activity and an activity taking place under a climate change scenario, especially since climate change scenarios are not available to many developing countries (Klein 2003, 41; Mace 2006, 64). The exclusion of adaptation activities on the basis of climate variability constitutes an obstacle (see e. g. decision 11/CP.2, FCCC/CP/1996/15/Add.1) in both meeting the (funding) needs of developing countries and in accessing funds.²²

The conceptual basis for funding described above in theoretical terms also applies to the third stage of adaptation funding, but the COP never provided explicit guidance for Stage III adaptation funding (Möhner / Klein 2007, 7). With the adoption of the so-called Marrakech Accords in 2001, it seems that the three-stage approach is no longer the only guidance for adaptation funding (Klein 2003, 39). At COP seven in Marrakech, the parties established three new funds (Least Developed Countries Fund, Special Climate Change Fund and Adaptation Fund) and decided on a number of additional adaptation activities, expanding the scope of activities previously supported by GEF, but adhering to the staged approach (see Decision 5 and 6/CP.7, FCCC/CP/2001/13/Add.1; Mace 2006, 59). They requested that the GEF establish “pilot or demonstration projects to show how adaptation planning and assessment can be practically translated into projects that will provide real benefits, and may be integrated into national policy and sustainable development planning” (Decision 6/CP.7, FCCC/CP/2001/13/Add.1). This strategic priority was later called “Piloting an Operational Approach to Adaptation” (SPA), and its objective is to reduce vulnerability to climate change and enhance adaptive capacity to the adverse effects of climate change in all GEF focal areas (GEF 2008, 2). In their initial guidance to the fund,

20 On “incremental costs”, see also GEF (1996): *“The cost of GEF eligible activity should be compared to that of the activity it replaces or makes redundant. The difference between the two costs – the expenditure on the GEF supported activity and the cost saving on the replaced or redundant activity – is the incremental cost. It is a measure of the future economic burden on the country that would result from its choosing the GEF supported activity in preference to one that would have been sufficient in the national interest.”*

21 The meaning of global (environmental) benefits for purposes of accessing GEF funding depends upon the goals of each convention and application of the GEF’s Operational Strategy (Mace 2005, 227).

22 See e. g. UNFCCC Decision 5/CP.8, which reflects the concerns about the “incremental cost” principle and which “invites” the GEF to make *“the concept of agreed incremental costs and global benefits more understandable, recognizing that the process for determining incremental costs should be transparent, flexible and pragmatic, consistent with the Beijing Declaration”*.

the parties did not specify the incremental cost principle (compare Decision 6/CP.7, FCCC/CP/2001/13/Add.1). The GEF Council states that projects are eligible that generate both local and global benefits “*so long as their benefits are primarily global in nature*” (GEF 2008a, 3; GEF 2004, 7). The GEF adhered to the “incremental cost” principle for the fund with the application of new rules on how to calculate incremental costs. It states, however, that there is a need to reconsider new approaches to the calculation of the incremental costs of adaptation, depending on guidance by the UNFCCC (GEF 2008d).

3.2.2 Guidance on the Least Developed Countries Fund and Special Climate Change Fund

The Least Developed Countries Fund (LDCF) and the Special Climate Change Fund (SCCF) were decided on in 2001 in Marrakech (Decision 27/CP.7 and 7/CP.7, FCCC/CP/2001/13/Add.1). The Least Developed Country Fund was established primarily to fund national adaptation programmes of action (NAPAs) and an LDC Expert Group (LEG) to provide guidance and advice on the preparation and implementation strategy for NAPAs. NAPAs are designed to communicate the urgent adaptation and short-term adaptation needs of LDCs and are the only specific document within the framework of the climate regime to exclusively address adaptation (Verheyen 2002, 133). In a second phase, the LDCF will also finance activities identified in the NAPAs.

The initial guidelines on the preparation of NAPAs issued at COP-7 called for a participatory assessment of domestic vulnerability to current climate variability and extreme weather events (Decision 28/CP.7, FCCC/CP/2001/13/Add.4). With the inclusion of climate variability in the assessment guidelines, the conceptual basis for funding of adaptation activities under the Least Developed Country Fund has broadened, in comparison to the GEF funding criteria. The parties recognized that reduction of current vulnerability to climate variability is a possible adaptation activity, and they no longer limit response strategies to impacts caused by anthropogenic climate change. Verheyen (2002, 134) notes that “*this is an important deviation from the principle in the funding provisions of the UNFCCC and might result in a situation in which the climate regime provides funding to measures that are beyond its initial scope*”. In their guidance to the LDC Fund, the COP decided to provide funding to meet the “additional costs” of activities to adapt to the adverse effects of climate change as identified and prioritized in the national adaptation programmes of action. “Additional costs” refers to the costs imposed on vulnerable countries to meet their immediate adaptation needs (Decision 6/CP.9, FCCC/CP/2003/6/Add.1; GEF 2006).

The Special Climate Change Fund finances activities that are complementary to activities in the climate change focal areas of the GEF, including (a) adaptation to climate change, (b) technology transfer, (c) economic diversification and (d) activities in the field of energy, transport, industry, agriculture, forestry and waste management (GEF 2007, 1; GEF 2008a, 4). It gives adaptation the highest priority with the objective of implementing long-term measures that increase the resilience of national development sectors to the impacts

Box 1: “Additional costs” of adaptation funded by the LDCF

“LDCF support to adaptation projects will be based on identifying and meeting additional costs. Activities that would be implemented in the absence of climate change constitute a project baseline, and the costs of achieving this development scenario are referred to as baseline costs or baseline financing. The altered plan of action required to achieve the national sustainable development goals, to build adaptive capacity, and to increase resilience to the anticipated climate change comprises an adaptation scenario. The costs of this adaptation scenario constitute the total project costs and will normally exceed the costs of the baseline scenario. The additional costs associated with meeting these extra adaptation needs imposed on the country by the effects of climate change will be supported by the LDCF.”

“The term ‘additional costs’ refers to the costs superimposed on vulnerable countries to meet their immediate adaptation needs, as opposed to the term ‘incremental costs’, paid by the GEF in projects that generate global benefits.”

Source: GEF (2006); GEF (2008a, 2)

of climate change.²³ Like the LDCF, the fund operates on the basis of ‘additional costs’. It is not necessary that it generates global environmental benefits, and it may generate local benefits if a project demonstrates ‘additional costs’ entailed by climate change for the development baseline. *“Activities are to be country-driven, cost-effective and integrated into national sustainable development and poverty reduction strategies”* (GEF 2007).

3.2.3 The Adaptation Fund under the Kyoto Protocol

The Adaptation Fund is also part of the Marrakech accords and was established in addition to the two previous funds to finance concrete adaptation projects and programmes in developing countries that are parties to the Kyoto Protocol (Article 12.8 Kyoto Protocol; Decision 10./CP.7; including activities listed in § 8 of 5/CP.7, FCCC/CP/2001/13/Add.4). Unlike the previous funds, financial contributions to the Adaptation Fund are obligatory in an indirect way. The fund receives a 2 % share of proceeds from the Clean Development Mechanism (CDM),²⁴ and it is thus linked to the emission reduction obligations of parties that signed the Kyoto Protocol.

The obligatory nature of adaptation funding links the Adaptation Fund to the concept of adaptation as compensation. This is affirmed by the new governance structure of the Adaptation Fund in comparison to that of the GEF. Decisions within the GEF are taken by the GEF Council, which consists of 32 members. The council is composed of 18 recipient country’ groupings and 14 constituencies made up of ‘non-recipient countries’. The GEF Council takes decisions by consensus, but if this seems impracticable, any member of the council may request a formal vote. *“Decisions requiring formal votes are generally taken by a double-weighted majority, which requires an affirmative vote representing both a*

²³ See Decisions 5/CP.7, 7/CP.7 and 5/CP.9. Initially the GEF received guidance from the COP to craft funding guidelines for items (a) and (b). At COP 12, the parties gave additional guidance on how to operationalize a program in the areas of (c) and (d); they can be found in GEF/LDC.SCCF.2/4/Rev.1; see also GEF/LDCF.SCCCF.4/Inf.3 for a progress report on the two funds.

²⁴ The CDM allows a country with an emission-reduction or emission-limitation commitment under the Kyoto Protocol (Annex B Party) to implement an emission-reduction project in developing countries.

Table 1: Funding adaptation under the UNFCCC			
	Funding source		Funding principle
	Donor contributions (total pledges outstanding and contributions finalized)		
Special Climate Change Fund (SCCF) Adaptation Programme ^{a)}	91 million US\$		additional costs
Least Developed Countries Fund (LDCF) ^{b)}	172 million US\$		additional costs
Special Priority on Adaptation (SPA) ^{c)}	50 million US\$		incremental costs (new rules)
		CDM share of proceeds	
Adaptation Fund (AF) ^{d)}	~0.5 million US\$	~58 million US\$ (currently) 620 to 960 million US\$ (2008-1012)	full adaptation costs

Source:

a) *“Funding for the project proposals included in the current work program and the current pipeline would require \$113.98 million from the SCCF Program for Adaptation. As total pledges to the Adaptation Program of the SCCF are now \$91 million, programming under this program cannot continue beyond 2008. As a result, the GEF Secretariat in February 2007 decided to close the pipeline for new submissions under the SCCF Adaptation Program until new funding becomes available.”* (GEF 2008b)

b) GEF 2008b

c) One-time replenishment for 3 a year-period; resources are entirely committed, SPA is ready for evaluation (GEF 2008d)

d) Donor contributions refer to contributions to the trust fund for administrative expenses of the Adaptation Fund after future reimbursement; the amounts available to the AF depend on monetization of CERs (certified emission reductions) from the CDM. The Fund currently holds 3 million CERs, which amounts to 45 million euros, using average prices for 2007. The conservative calculation is based on the estimated amount of CERs to be allocated to the AF of around 32 million CERs, spread over the 2008–2012 period, using the 2007 average price for CERs; 960 million US\$ is a risk-adjusted value for CERs using projected December 2008 prices of 30 US\$/ton (Adaptation Fund Board 2008a; presentation by trustee, 2nd AF Board meeting, 16.–19.2008)

60 % majority of the total number of participants and a 60 % majority of the total contributions” (Mace 2005, 230, 229). This voting system gives major donor countries a greater influence on council decisions and hence differs from the UN voting system of one country, one vote. Developing countries, therefore, had been opposed to establishing the GEF as the financial mechanism of the UNFCCC and argued for a new institution under the authority of the parties to the convention (Bodansky 1993, 538). This was opposed by developed countries that *“did not wish to entrust their money to a new untested mechanism, potentially under the sway of developing countries”* (Bodansky 1993, 538).

The Adaptation Fund is a new financing institution for adaptation to climate change. At the third meeting of the parties to the Kyoto Protocol, it was decided that the operating entity of the Adaptation Fund would be the Adaptation Fund Board, and the GEF was

invited to provide secretariat services only and the World Bank (International Bank for Reconstruction and Development) was called on to serve as a trustee for the Adaptation Fund (Adaptation Fund Board, 2008a; AFB.B.2/CRP.2, June 18, 2008; 1/CMP.3). The Adaptation Fund Board is composed of 16 members and 16 alternates, formally elected by a meeting of the Conference of the Parties serving as the meeting of the Parties to the Kyoto Protocol. It has a majority representation for developing countries, comprising two representatives from each of the five United Nations Groups, one representative of the small island developing states, one representative of the least developed country parties, two other representatives from Annex I parties and two other representatives from non-Annex I parties.²⁵ The Adaptation Fund Board is to be responsible for the supervision and management of the Adaptation Fund, including for example the development of operational policies, guidelines and eligibility criteria for implementation of projects consistent with Decision 5/CMP.2 (Adaptation Fund Board 2008c, 1). Decisions of the Board are to be taken by consensus whenever possible and by a two-thirds majority of the members present, on the basis of one member, one vote (Adaptation Fund Board 2008d, 5).

This new institutional governance structure gives “control” over disbursement of financial resources to potential recipient countries. The Fund will not apply the incremental cost principle but will support adaptation on a full-cost basis (Adaptation Fund Board 2008c, 1; AFB/B.2/3). It is most likely that the Adaptation Fund will apply a broad conceptual basis in seeking to consider, to the greatest extent possible, developing countries’ needs and their interpretation of the term “adequate adaptation”. The Fund is not yet operational and policies and guidelines for access to funds by parties still need to be elaborated.

4 Adaptation in the scientific discourse

The conceptual discussion of adaptation to climate change within the UNFCCC and its rise on the policy agenda evolved in interaction with the scientific discourse, which reflects to a certain extent the political discussions and vice versa. There are parallels in the evolution of conceptual thinking but also specifications as represented in the IPCC Assessment Reports which are not echoed in the political discussions or the institutional set-up of the UNFCCC. The IPCC assessment reports summarize and reflect scientific viewpoints on climate change for decision makers and serve as a basis for decisions of UNFCCC negotiators. The scientific discussion on adaptation illustrates the various theoretical approaches to adaptation and possible entry points for framing adaptation, adaptation planning and action.

4.1 The evolution of conceptual thinking in adaptation research

In ways similar to the political process, adaptation in response to climate change for a long time received little attention by scientists. The main reason was uncertainty as to whether there was a human influence on climate change and what the range of climate change and its effects would be (see e. g. Smithers / Smit 1997). In his review of the second IPCC

²⁵ For a list of board members, see <http://www.adaptation-fund.org/>.

report, Kates criticizes the scant analysis on adaptation and explains this with reference to two schools of thought, the “preventionist” and “adaptationist” schools (Kates 1997, 32). Preventionists argue that any action on adaptation is premature and that, instead, drastic reductions of greenhouse gases are necessary to avoid possible catastrophic impacts of climate change. They fear that work on adaptation “*will weaken society’s willingness to reduce greenhouse gas emissions*” (Kates 1997, 32). Adaptationists argue “*that the projected changes in climate will be slow enough that both nature and human society can [...] adapt to them*” (Kates 1997, 31). They point to the long history of natural and human adaptation to climate fluctuations.

Both perspectives on the magnitude of climate change and corresponding adaptation necessities discouraged research on adaptation and tended to ignore developing countries’ inability either to prevent or to adapt to climate change (Kates 1997, 32). This changed with the publication of the second and, and at the latest, third assessment report of the IPCC (see e. g. Klein 2003, 33). The so-called ‘realist’ school (Klein / MacIver 1999) emerged on the basis of enhanced knowledge of climate change and its impacts and following the publication of the IPCC’s Second Assessment Report, which sees adaptation as a “crucial and realistic response option” along with mitigation. “*The realist school positions itself between the two extreme views of the preventionists and adaptationists. Realists regard climate change as a fact but acknowledge that impacts are still uncertain*” (Klein 2003, 33, quoting Parry et al. 1998; Pielke 1998 as examples). In line with this rationale, adaptation to current climate variability had been proposed in preparation for long-term climate change.²⁶ There are few scientists who see adaptation as the only response option to climate change (Schipper 2006, 83 referring to Okonski 2003, as one example).

The issue of adaptation received increasing attention in global climate change research only towards the end of the 1990s, but it was able to draw on adaptation concepts from other fields of science. According to Smithers / Smit, the term adaptation has its roots in population biology and evolutionary ecology and has found wide application in scientific research on human-environment interaction such as cultural ecology, natural hazard research or ecological anthropology.²⁷ This application in various fields of research led to distinct interpretations of the concept of adaptation, but there are also broad consistencies in the use of the term as outlined in Chapter 4.2 (Smithers / Smit 1997, 133 ff.; Wheaton / MacIver 1999, 216). As one specific feature of adaptation to climate change, Schipper (2004) points to its objective of adjusting entire human systems to a different set of external parameters instead of single components, and Füssel names several aspects of adaptation which are new despite the long history of adaptation to climate and climate change. Among these are unprecedented climate conditions, an unprecedented rate of global climate change, unprecedented knowledge that makes adaptation planning possible, and new actors who previously did not need to consider changing climate factors in their decisions (Füssel 2007, 268).

26 See Burton (1997) or Smithers / Smit (1997) for a discussion of the distinction between climate and climate change from the perspective of adaptation.

27 See Smithers / Smit (1997, 133) for further reading on adaptation research in different scholarly fields and Schipper (2004) on the influence of the fields of ecology and anthropology as background information on interpreting adaptation to climate change.

Impact- and vulnerability-based approaches

Many scholars conceptualized adaptation to climate change by contrasting it with other, similar, and to a certain extent interrelated concepts like “vulnerability”, “resilience”, “coping” or “risk management”.²⁸ In particular, the way vulnerability is interpreted in climate change research and the way adaptation and vulnerability are conceptualized in relation to one another are important as they show the two broad entry points of how adaptation had been framed in assessments and what associated adaptation measures are. There are two major assessment approaches, climate scenario-driven impact assessments and vulnerability-based approaches (Carter et al. 2007; FCCC/SBSTA/2004/Inf.13; Füssel 2007, 271; Füssel / Klein 2006; Burton et al. 2005).²⁹

In the scenario-driven impact assessment,³⁰ vulnerability is viewed as the end point of analysis, as the residual of climate change impacts minus adaptation. The assessment approach aims to evaluate the likely impacts of climate change under a given scenario derived from general circulation models (GCMs) and to assess the need for adaptation and/or mitigation to reduce any resulting vulnerability to climate risk (Carter et al. 2007, 136).

“The chosen scenarios were commonly applied to models of ecosystems, to specific species within an ecosystem, or to a component of the biogeophysical environment such as sea level; coastal zones, including coral reefs; the hydrological cycle; mountains; deserts; or small islands. These ‘first order’ impacts were sometimes carried forward to the modelling of ‘second order’ impacts on economic sectors such as agriculture, forestry, water resource management, human health, and so forth. Only at the end of a long research process was adaptation considered, and only infrequently were socioeconomic scenarios developed alongside the climate scenarios” (UNFCCC 2008, 2).

In this approach, vulnerability summarizes the net impact of the climate problem and can be represented quantitatively as monetary cost, human mortality, ecosystem damage or qualitatively as a description of relative or comparative change (O’Brien et al. 2004, 2 based on Kelly / Adger 2000, 326).

In the vulnerability-based approach,³¹ vulnerability is considered as a starting point for analysis. The vulnerability-based approach starts out research with current climate variability and adaptation (or the lack of adaptation or maladaptation) in addition to future climate change. It broadens research to non-climatic factors such as environmental and social stressors as well as changes in socioeconomic conditions (O’Brien et al. 2004, 2; UNFCCC 2008, 2).³²

28 For a discussion, see e. g. Schipper (2004); Brooks (2003); Füssel / Klein (2006); Kelly / Adger (2000).

29 An approach is defined as “the overall scope and direction of an assessment and can accommodate a variety of different methods” (Carter et al. 2007, 135). Within these two approaches, there is no general methodology for adaptation assessment due to the great diversity of analytical methods employed (Carter et al. 2007, 138).

30 Also referred to as hazard-based, model-based, top-down approach and ‘type 1’ or “first generation” adaptation research.

31 Also called bottom-up approach, ‘type 2’ or “second generation” adaptation research.

32 For examples of research guidelines and frameworks that apply this approach, see Burton et al. (2004); The National Adaptation Programmes of Action (NAPAs, see Chapter 3.2.2); the AIACC projects

The scenario-driven impact assessment dominated the literature in the 1990s and was the standard approach developed in the IPCC guidelines of 1994 (Carter et al. 1994).³³ It originated with the purpose of quantifying vulnerability to climate change by asking what the extent of the climate change problem is and whether the costs of climate change exceed the costs of greenhouse gas mitigation. The adaptation options identified under this approach included rather static, technological options such as irrigation schemes, drought-tolerant seed varieties, infrastructural improvements etc. (O'Brien et al. 2004, 3–5). The assessment approach, however, broadened in accordance with the realist school and the notion that climate variability (in past and present), offers valuable starting points for the assessment of adaptive capacity and adaptation.

The vulnerability-based approach that follows this rationale has its origins in assessments of social vulnerability and asks who is vulnerable and why and how vulnerability can be reduced. It analyses inherent social and economic processes of marginalization and inequalities as the causes of climate vulnerability and seeks to identify ways of addressing these (O'Brien et al. 2004, 2). It is one purpose of the approach to identify policies or measures that reduce vulnerability, increase adaptive capacity, or illuminate adaptation options and constraints (O'Brien et al. 2004, 2). Adaptive capacity is defined by the IPCC as “*the potential or ability of a system, region, or community to adapt to the effects or impacts of climate change*” (Smit et al. 2001, 881). The types of policy measures that emerge from these assessments are rather social than technical in nature and include poverty reduction (O'Brien et al. 2004, 5).

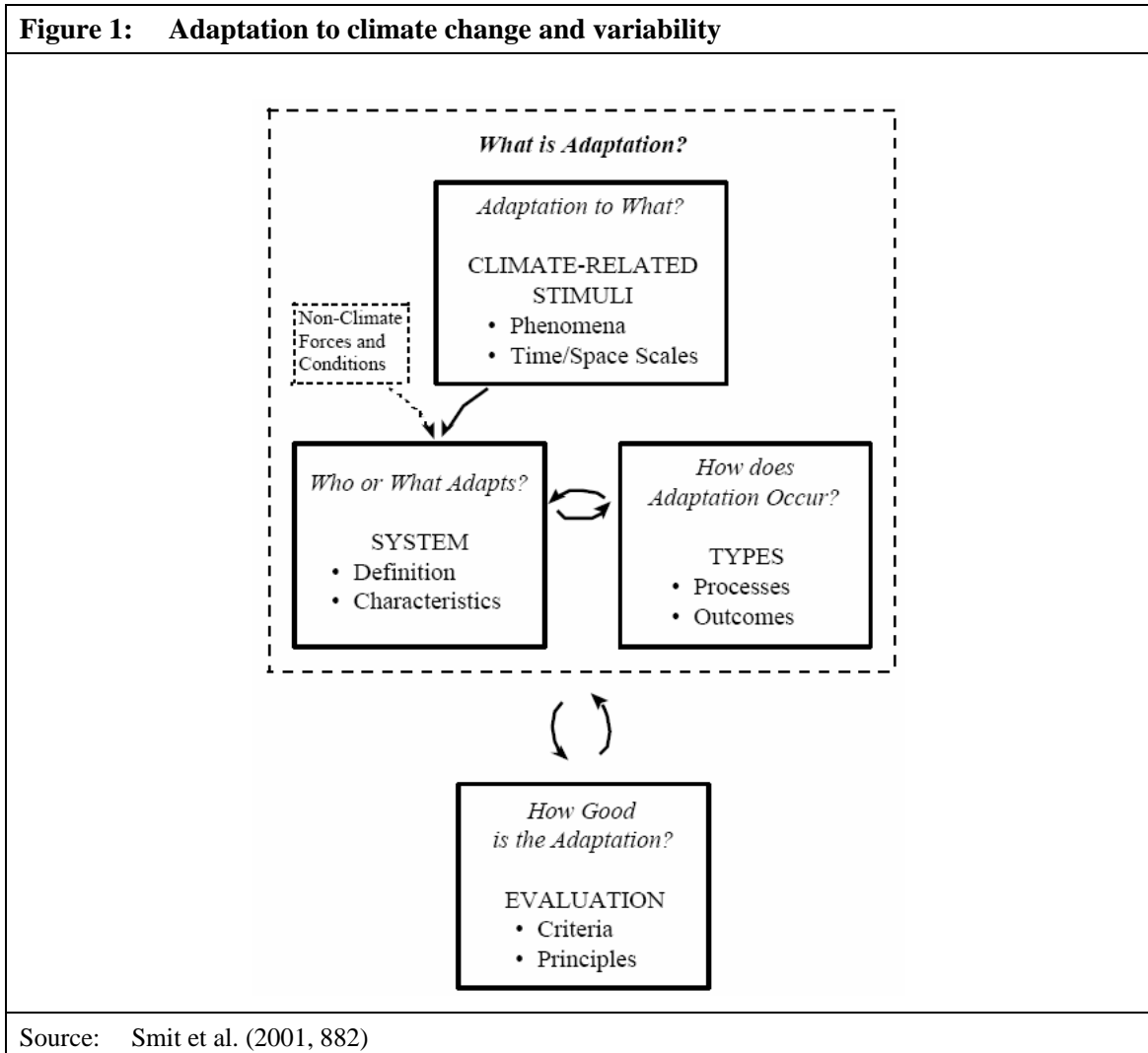
The described shift from research- or climate science-oriented agendas to policy-oriented approaches tailored to decision-making in adaptation assessment (see Füssel / Klein 2006, 302; Carter et al. 2007, 136) also points to a shift in problem perception and definition. Whereas the impact-based approach is derived from the perception that (long-term) climate change is the main problem and therefore climate protection is the main solution, with adaptation playing a negligible role, the vulnerability-based approach argues from a development perspective, emphasizing adaptation and development needs and problems, and starting from a perspective of current climate variability.

The shift in assessment also implies a shift in conceptual thinking about adaptation, as reflected in the IPCC Assessment Reports. Initially, climate change studies did not consider transient effects or variability and assumed that systems will adjust or not adjust to climate scenarios (see IPCC [1996]; Smithers / Smit 1997 [132]; see Smithers / Smit [1997], 129, for further reading). Only a few empirical studies have focused more directly on adaptation, but they have rarely considered the process-related questions of when, why and under what conditions adaptations actually occur. This changed with the growing interest in adaptation planning and related institutional arrangements (Smithers / Smit 1997, 132). Another reason for the assumption-based treatment of adaptation was that concepts of adaptation were still evolving and that there was no common understanding of what is meant by the term (Smithers / Smit, 1997, 129–130). Although this remains a

(Assessment of Impacts and Adaptations to Climate Change, see www.aiaccproject.org); the UNDP Adaptation Policy Framework (APF; see http://ncsp.undp.org/report_detail.cfm?Projectid=151).

33 The IPCC guidelines of 1992 did not yet consider adaptation, see Carter et al. (1992); for further information on the IPCC guidelines, see also Carter (1996); other guidelines in this tradition include: Kates / Ausubel / Berberian (1985); Benioff et al. (1996) or Feenstra et al. (1998).

challenge, the following chapter will outline broad consistencies and core characteristics of adaptation definitions.



4.2 Characteristics of adaptation

The need for fundamental work on systematically defining adaptation to climate change was suggested by Smit and other authors with the aim of structuring research and policy development (Smit et al. 1999, 2000). In their work they synthesize general agreed-upon concepts and terms of adaptation that presently find broad acceptance in research and are widely reflected not only in the third IPCC assessment report (Smit et al. 2001) but also in the fourth report of 2007 (Adger et al. 2007, 720). In brief, the IPCC defines adaptation as “*adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities*” (IPCC 2007, WG II 869).³⁴ The term can refer to changes in processes, practices or structures as well as to the condition of being adapted (Smit et al. 2001, 881 f.). Three questions

³⁴ See also Annex I for the evolution of IPCC definitions of adaptation in the four assessment reports.

broadly frame the definition of adaptation: (a) Adaptation to what? (b) who or what adapts? and (c) how does adaptation occur?

Adaptation takes place in response to actual or expected climatic stimuli or their effects. This can, for example, refer to temperature or effects such as drought or crop failure. These stimuli or the phenomena to which adaptations are made need to be specified according to temporal criteria, whether the changes are long-term changes, mean annual or decadal climate variability or extreme events (Smit et al. 1999, 205). Changes in the mean condition commonly fall within the so called coping range, the variation in climatic stimuli that a system can absorb without producing impacts (IPCC 2001b, WG II 882, 985). The stimuli need to be specified according to system relevance and the question *who or what adapts?* This refers to the nature of the system, whether it is e. g. ecological, economic, social or political. It also implies the question of scale and actors, as adaptation can refer to levels ranging from the local to the global as well as to different actors. The research has devoted considerable attention to the characteristics of a system that influence adaptive capacity (referred to as “adaptability” in the 1996 IPCC report, see Annex I). These characteristics, also called determinants, have been used to differentiate systems according to their likelihood of adaptation or need for adaptation (Smit et al. 2000, 236; Smit et al. 2001, 893). Terms like “sensitivity”, “vulnerability”, “susceptibility”, “coping range”, “critical levels”, “resilience” and others have been used to describe this (Smit et al. 2000, 236).

The definition of the climate-sensitive system leads to the question of *how adaptation occurs* and what the attributes, forms and types of adaptation are (Smit et al. 2001, 882–884). Table 2 summarizes common attributes and characteristics. In unmanaged natural systems, adaptation is autonomous and reactive to climate stimuli. In human systems, adaptation can be both autonomous and planned. Autonomous adaptations are widely interpreted as initiatives by private or market actors rather than by governments, and they usually take place without intervention by the public, triggered by market or welfare changes induced by actual or anticipated climate change (Smit et al. 2001, 884 based on Leary 1999, Adger et al. 2007, 720). Autonomous adaptation is seen as a safe level with respect to climate impacts and represents a baseline against which the need for planned adaptation can be evaluated. But reviews also indicate that a ‘wait and see’, or reactive, approach can be inefficient and lead to irreversible damage such as species extinction or ecosystem damage (Adger et al. 2007, 721).

Planned adaptation is often interpreted as a result of deliberate a policy decision taken to minimize losses or benefit from opportunities. Such a decisions may be long-term, localized or widespread and may serve various functions and take numerous forms (see Table 2). It can be either anticipatory or reactive, although the boundary between the two may be blurred in practice (Watkiss et al. 2007, 30; Smit et al. 2001, 884).³⁵ Adaptations tend to be ongoing processes, reflecting many factors or stresses, rather than discrete measures designed to address climate-change specifically (Adger et al. 2007, 720).

35 Watkiss et al. explain the difficulty in differentiating clearly between planned and autonomous adaptation: “*Firstly, autonomous and planned adaptation often coexist. Secondly adaptive behaviours characterising social economic systems are often put in place by rational or informed economic agents who follow specific strategies. But unless these strategies are the outcome of a plan by a public agency or administration, these are considered autonomous*” (Watkiss et al. 2007, 30).

Table 2: Common attributes and characteristics of adaptation		
General Differentiating Concept or Attribute	Examples of Terms Used	
Purposefulness	Autonomous	Planned
	Spontaneous	Purposeful
	Automatic	Intentional
	Natural	Policy
	Passive	Active
		Strategic
Timing	Anticipatory	Responsive
	Proactive	Reactive
	<i>Ex ante</i>	<i>Ex post</i>
Temporal Scope	Short term	Long term
	Tactical	Strategic
	Instantaneous	Cumulative
	Contingency	
	Routine	
Spatial Scope	Localized	Widespread
Function / Effects	Retreat – Accommodate – Protect	
	Prevent – Tolerate – Spread – Change – Restore	
Form	Structural – Legal – Institutional – Regulatory – Financial – Technological	
Performance	Cost – Effectiveness – Efficiency – Implementability – Equity	
Source:	Smit et al. (1999)	

4.3 Conceptualizing adaptation for cost calculation

The aforementioned core characteristics of adaptation mentioned above are usually also applied for calculating costs of adaptation and are specified on that basis. Many studies on the impacts of climate change and related costs only take autonomous adaptation into account (Watkiss et al. 2007, 29 based on Warren et al. 2006). Some authors differentiate between autonomous *direct* adaptation, changes of economic agents in response to a climate stimuli, and autonomous indirect adaptation as the market response resulting from autonomous direct adaptation (Aaheim / Aasen 2008, 2). In differentiating between private and public adaptation, adaptation is also characterized as a public good, referring to types of adaptation that are underrepresented in the market and therefore need to be provided by public institutions (Watkiss et al. 2007, 30; Kuch / Gigli 2007, 15; Aaheim / Aasen 2008, 2 f.). The benefits of adaptation measures, however, are not seen as serving to provide global benefits (Fankhauser 1996, 90).

Planned adaptation can include changes in infrastructure as well as in standards and regulations (e. g. Watkiss et al. 2007, 30), and they thus encompass the impact- as well as the vulnerability-based approach. The latter approach is also involved in the definition of adaptation as a no-regret measure, because an adaptation activity is seen as a contribution that would render societies less vulnerable to many different pressures, including climate

variability (Watkiss et al. 2007, 32; Callaway 2003, 9; Smit et al. 2001, 892). In this sense, no-regret adaptation policy is conceptualized primarily as development policy (see Callaway 2003, 9).

In general, adaptation costs are conceptualized according to two related categories, the costs of adaptation measures, e. g. building sea defences, and the costs of damage caused by global warming, such as decreased yields or the costs of extreme events like floods (e. g. Fankhauser 1998, 3; Yamin / Depledge 2004, 217). Stern, for example, defines the gross benefit of adaptation as damage that is avoided, the net benefit of adaptation being damage avoided minus the costs of adaptation, and he deduces the costs of climate change as the residual costs of climate damage plus costs of adaptation (Stern 2006, 405, based on Fankhauser 1998, 3; see also Kuch / Gigli 2007, 18). In cost calculations there is, however, a lack of conceptual agreement on what adaptation to climate change is (Callaway 2003, 8),³⁶ and it is a matter of controversy from a policy perspective. A monetised metric has limitations as the aggregation can mask uneven distribution of climate change impacts. Estimating climate change impacts on GDP may not consider impacts on subsistence farmers, for example (Yamin / Depledge 2004, 217).

5 Addressing adaptation in development policy and practice

Climate change, and adaptation to climate change in particular, was long not explicitly addressed in development policy and practice. A comparative analysis of portfolio screenings of five development agencies between 1999 and 2006³⁷ concluded that agencies made few or no links to climate change. If mentioned, climate change was mainly seen as an environmental issue and framed as a question of mitigation (Eriksen et al. 2007, 31). Correspondingly, in the same time period funding for adaptation within bi- and multilateral development agencies received only a small percentage of the overall official development assistance (ODA) budget (see e. g. Frankel-Reed 2006, 3, 14).

In that very time period, however, the attention accorded to climate change and adaptation to climate change rose constantly in development policy and practice. It gained momentum with the publication of the third IPCC assessment report and the support for adaptation by UNFCCC parties based on the 2001 Marrakech Accords (see above). The Delhi Ministerial Declaration at COP 12 again emphasized the link between climate change and sustainable development (UNFCCC 1/CP.8), and bi- and multilateral donors have also addressed the need to integrate adaptation to climate change into their operations (AFD et al. 2003). Also, developing countries have more often raised the issue of vulnerability and adaptation to climate change in development cooperation-related activities, as indicated by the mention of adaptation in Poverty Reduction Strategy Papers (PRSP) (see Table 3).

36 For a critical discussion of methodologies applied to adaptation cost calculations, see Agrawala et al. (2008) and Watkiss et al. (2007).

37 Burton / van Aalst (1999); Klein (2001); Eriksen / Naess (2003); Agrawala et al. 2003a–d, 2004a, b; Robledo et al. (2006).

	Adaptation	Mitigation	Both
Interim	9	27	0
PRSP I	46	73	46
PRSP II	73	91	73

Source: The information is based on countries that have completed an interim PRSP and two full-sets of PRSPs since 1999. Eleven countries were considered: Cambodia, Ghana, Guinea, Lesotho, Madagascar, Malawi, Mozambique, Nicaragua, Tanzania, Vietnam, Zambia (IDA 2007, 10, 28)

Only in 2006 did development co-operation ministers of the Organisation of Economic Cooperation and Development (OECD) and heads of agencies together with OECD environment ministers officially declare their intent to integrate climate change adaptation into development co-operation (OECD 2006; see also OECD 2008). As possible entry points for integration, they mentioned country assistance strategies, sectoral policy frameworks, PRSPs, environmental impact assessment and others, which should be in line with the Paris Declaration on Aid Effectiveness. Also, the development of tools to systematically address climate risks (“climate proofing”³⁸) in development activities is seen as one task and instrument for implementation.

There seems to be consensus in development policy that adaptation should be addressed by mainstreaming it into development cooperation instead of implementing “stand-alone” projects separately from ongoing development cooperation (e. g. AfDB et al. 2003; OECD 2008). This position is contested in international climate politics when it comes to questions of financing (see Chapter 5.2). Mainstreaming adaptation is seen as an efficient and effective way of using financial and human resources; the concept is borrowed from the integration of other relevant development topics into development cooperation, including e. g. gender (Klein et al. 2007, 25; Mitchell / Tanner 2006b, 7). “*Mainstreaming involves the integration of policies and measures that address climate change into development planning and ongoing sectoral decision-making, so as to ensure the long-term sustainability of investments as well as to reduce the sensitivity of development activities to both today’s and tomorrow’s climate*” (Klein et al. 2007, 25, based on Klein 2002, Huq et al. 2003; Agrawala 2005). The UNFCCC’ LDC Expert group defines mainstreaming adaptation related to NAPAs, as “*the integration of the objectives, policies, strategies or measures outlined within a NAPA such that they become part and parcel of national and regional development policies, processes and budgets at all levels and at all stages, and such that they complement or advance the broader objectives of poverty reduction and sustainable development*” (LDC Expert Group 2002, 19 quoted in Schipper 2004, 71).

As outlined in the previous chapter, one challenge, also for mainstreaming adaptation into development cooperation, is the definition of adaptation itself. How does development

38 “*Climate proofing - a shorthand term for identifying risks to a development project, or any other specified natural or human asset, as a consequence of climate variability and change, and ensuring that those risks are reduced to acceptable levels through long-lasting and environmentally sound, economically viable, and socially acceptable changes implemented at one or more of the following stages in the project cycle: planning, design, construction, operation, and decommissioning*” (ADB 2005, xii).

cooperation define adaptation? What are the entry points based on that development agencies use to initiate or modify development measures? Like the UNFCCC, development agencies have a kind of catalytic role in addressing adaptation needs and leveraging action on the ground.

5.1 Framing adaptation for action

Thus far there has been little systematic analysis in the literature on how adaptation to climate change is mainstreamed and how adaptation is conceptualized in this regard. This might be due to the fact that many development agencies are still in a phase of piloting adaptation projects and developing tools for integrating adaptation to climate change into running operations.

In theory, there are four general ways in which adaptation to climate change is relevant to ODA and development projects in general: (1) the risks that climate change impacts pose to development projects, (2) vulnerability to current or future climate stimuli of the community or ecosystem that is intended to benefit from the project, (3) possible effects of an ODA project on the vulnerability of communities or ecosystems to climatic stimuli (compare Klein et al. 2007, 24), including maladaptation, and (4) the strategic and broader development context beyond a project itself related to the question of what the risks of and vulnerabilities to current and future climate stimuli in a country or region may be. The focus in the literature on adaptation in development policy is on the first two approaches.

Initially, the discourse on adaptation in development cooperation centered around the future risks of climate change impacts on development projects only. Adaptation was discussed as a kind of “retrofitting” of development planning to expected future climate change impacts, and it focused on technological solutions such as irrigation schemes or construction of higher dams. In this traditional view, mainstreaming adaptation would largely refer to “ensuring that projections of climate change are considered in the decision making of relevant government departments and agencies, so that technologies are chosen that are suitable to the future climate” (Klein et al. 2007, 26). This would refer to the impact-oriented approach to adaptation as outlined, for example, by the IPCC guidelines of 1994 and as described above in Chapter four. This approach does not centre on the links between poverty and adaptive capacity.

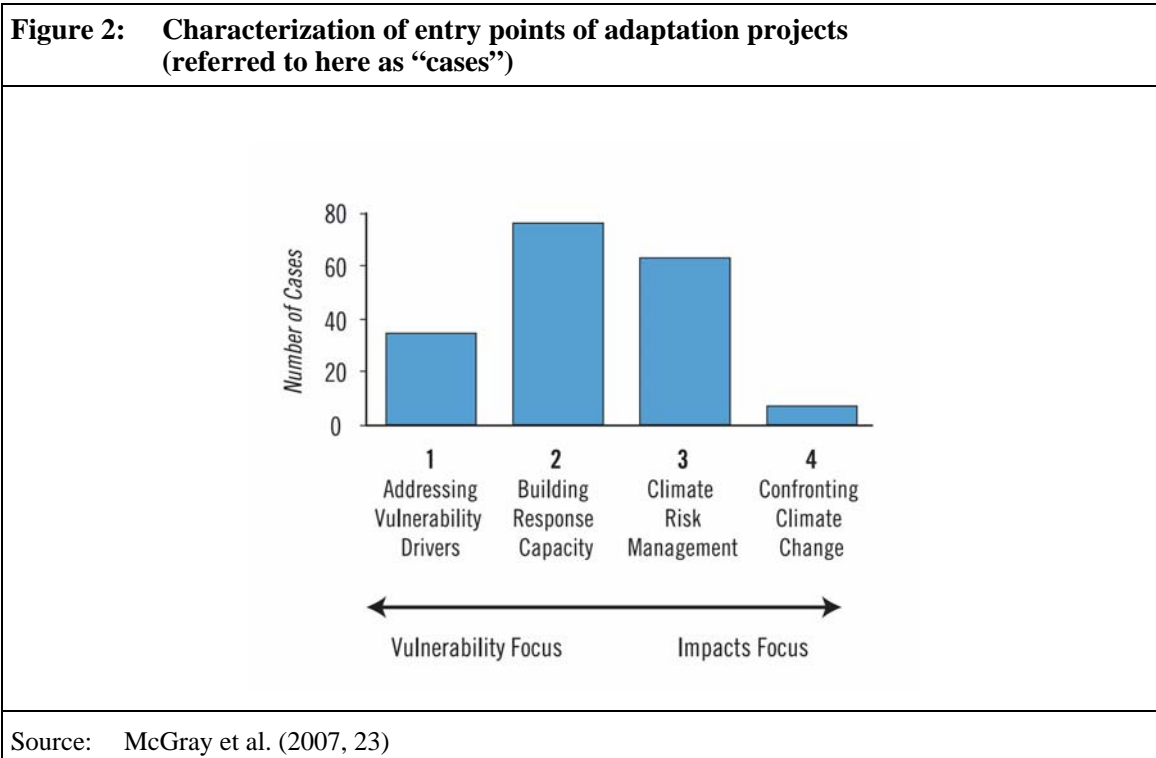
Most of the tools that have been developed seem keyed to this approach and focus on climate change impacts and risks (Klein et al. 2007, 39). Thus far, however, no in-depth review has appeared. One example of the impact-oriented tool is the project screening tool ADAPT (Assessment and Design for Adaptation to Climate Change: A Prototype Tool) developed by the World Bank. It helps the project developer identify climate risks of a project and find sources of information on how to minimize that risk.

The impact-oriented approach to adaptation has been questioned by developing countries. The main reason is on the one hand uncertainty and lack of knowledge about regional or local impacts of climate change and on the other hand financial constraints. “*Particularly for poor countries, allocating scarce resources to short-term development needs – poverty alleviation, primary health care, and combating disasters, food and housing scarcities and the like – leaves little, if any, funding for measures to anticipate the impact of uncertain*

future climate change such as those described on the basis of [...] scenarios” (Apuuli et al. 2000, 146). This is also reflected in the initial national climate action plans for the UNFCCC from developing and transition countries. They emphasize strategies for adaptation measures relevant to immediate national development priorities (Apuuli et al. 2000, 146). A survey by the United Nations Development Programme revealed that soft adaptation measures are a top priority of governments and development agencies (UNDP 2007, 5).

This perspective is also embraced by the screening tool CRISTAL (Community Risk Screening tool – Adaptation and Livelihoods), which was developed by a consortium of NGOs and applies a sustainable livelihoods framework. This tool focuses on the vulnerability of a community to climate stimuli and the impacts a development project may have on it. It seeks to understand the links between local livelihoods and climate, to assess a project’s impact on community-level adaptive capacity and, finally, to improve the project’s contribution to adaptive capacity (Klein et al. 2007, 39). Livelihoods refer to the capabilities, material and social assets and activities required for a means of living (Eriksen / Naess 2003, 14).

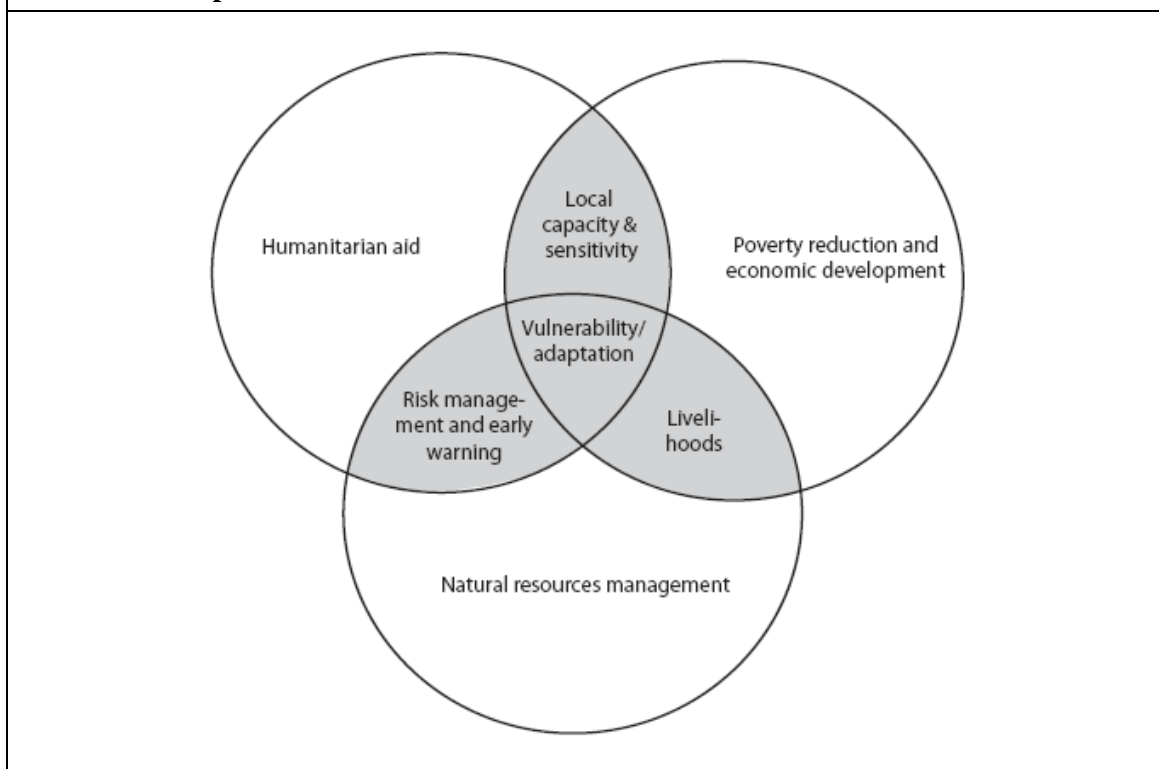
As indicated by a review of 135 activities in developing countries that were labelled as such by project developers or researchers, this development-oriented perspective dominates the majority of adaptation projects on the ground and only a limited number of projects focus exclusively on addressing impacts associated with climate change (McGray 2007, 21; see also Mitchell / Tanner 2006a, 11). The authors of that study note that adaptation projects hardly differ from normal development projects and that “the majority of cases utilize methods and approaches that come straight from the development toolbox” (McGray et al. 2007, 14). Some projects mainly address vulnerability drivers and focus on human development in general (e. g. livelihood diversification, literacy promotion), many projects focus on building response capacity by developing problem-solving systems. In addressing, more specifically, climate risks resulting from climate variability, many pro-



jects apply the concept of climate risk management (CRM). It refers to the process of incorporating climate information into decisions to reduce negative effects on resources and livelihoods (McGray 2007, 21 based on Hellmuth 2007). The main conceptual difference of these projects is the proportion they are considering climate stimuli with whether referring to current climatic conditions or changes in the medium or long-term (see also Figure 2). The vulnerability-based approach emphasizes current climate variability and non-climatic stressors, whereas the impact-based approach focuses on expected climatic changes and subsequent impacts on water availability, food production etc.

The corresponding strategic entry points used to address adaptation in the projects reviewed, risk management and capacity building, were also identified as strategic entry points for adaptation for Norad, Norwegian development co-operation, as illustrated by Figure 2. The livelihood framework has been proposed as a third strategic entry point for addressing vulnerability (Eriksen / Naess 2003, 14); it is also applied by the CRISTAL screening tool, as described above. The three proposed entry points for adaptation interface with three main areas of development co-operation: humanitarian aid, poverty reduction and economic development and, finally, natural resource management (see Fig. 3.; see Table 4 for project examples).

Figure 3: The strategic interface between areas of development cooperation and adaptation



Source: Eriksen / Næss (2003, 13)

The project examples cited for the three entry points again illustrate the significant overlap of vulnerability-oriented adaptation and traditional development projects. This raises the question whether it is possible to differentiate between development activities in general and measures that aim at reducing vulnerability to climate change.

Table 4: Entry points for adaptation and examples		
Livelihoods	Local capacity and sensitivity	Risk management and early warning
<ul style="list-style-type: none"> – economic opportunities for the poorest, including seasonal migration labour – climate considerations in economic and infrastructural development – access to and viability of, communal resources and biodiversity (including forest products) – processing and marketing of local products – health and education – the role of local knowledge in economic development – women’s coping mechanisms, and the “informal” based mechanisms 	<ul style="list-style-type: none"> – integration between “traditional” and “modern” agricultural and pastoral technologies and management systems – linkages between local “informal” institutions and authorities – diversity of crops, agrobiodiversity – integration of adaptation into government department activities – land use planning and infrastructure planning – seed and input distribution, in particular local seed varieties and inputs – local research on crops, livestock and economic development that are adapted to the local climate 	<ul style="list-style-type: none"> – early warning systems – local disaster response strategies (national and local institutions) – natural resource management based protection (mangroves, water catchments) – the space of local climate information as well as meteorological and climatological capacities of national institutions – national adaptation plans and vulnerability assessments – coastal defenses, urban drainage and water supply, hydroelectricity, flood defences
Source: Eriksen / Næss (2003, 16)		

5.2 Differentiating development and adaptation

Poverty- and especially vulnerability-based adaptation share many determining factors, and it is likely that many measures that aim at adaptation simultaneously reduce poverty (e. g. Eriksen / Naess 2003, 14) and vice versa. Many authors, for example, point to the interlinkages between attaining the Millennium Development Goals and adaptation or adaptive capacity (Mitchell / Tanner 2006a, 8; Ziervogel / Taylor 2008, 34; Levina 2007, 25, Harmeling / Bals 2007, 9 ff.). However, the question to what extent, development and adaptation activities overlap in practice and can be seen as ‘no-regret’ strategies has not received much scholarly attention thus far. Not all development projects that aim at reducing poverty amount to vulnerability reduction (Adger et al. 2003; Eriksen / Kelly 2006; Eriksen / O’Brien 2007, 337). Widely cited examples include conversion of mangroves into shrimp farms, which typically render coastal areas more vulnerable to storm surges, or infrastructure projects in disaster-prone areas. There has been less discussion on possible adverse effects of adaptation measures on development and income in particular, especially considered on a short-term basis. This could, for example, be the case with a shift to climatically well-adapted crops in agriculture versus crops that yield higher prices in the market but are less adapted to climatic conditions and the natural resource base over the long term. A small shift in priority, in favor of either development or adaptation, can lead to very different impacts on the ground.

These brief examples illustrate that while there is a significant overlap between the concepts of adaptation and development, that they are not equivalent. From the UNFCCC funding perspective - where the parties are obliged to provide new and additional ODA funds (see Chapter 3.2) - the impossibility to clearly distinguish between adaptation and development constitutes an insurmountable barrier to proving the additionality criteria. In international climate politics, the concept of mainstreaming is therefore questioned by some developing country parties as they fear that this will lead to a diversion of ODA resources for climate change measures mandated by the convention (Yamin 2005, 353).

6 Institutional challenges in targeting adaptation

The previous chapters have shown that the definition and conceptualization of adaptation remains rather broad, a fact that has led some scientists to refer to it as a “wicked problem” (see Box 2). There are several possible entry points for addressing adaptation in practice and in institution building. Nevertheless, some core characteristics of adaptation are emerging from the process of framing and reframing of the three above-analysed discourses which need to be considered in an institutional response to climate change and which imply several challenges.

Box 2: Adaptation as a “wicked problem”

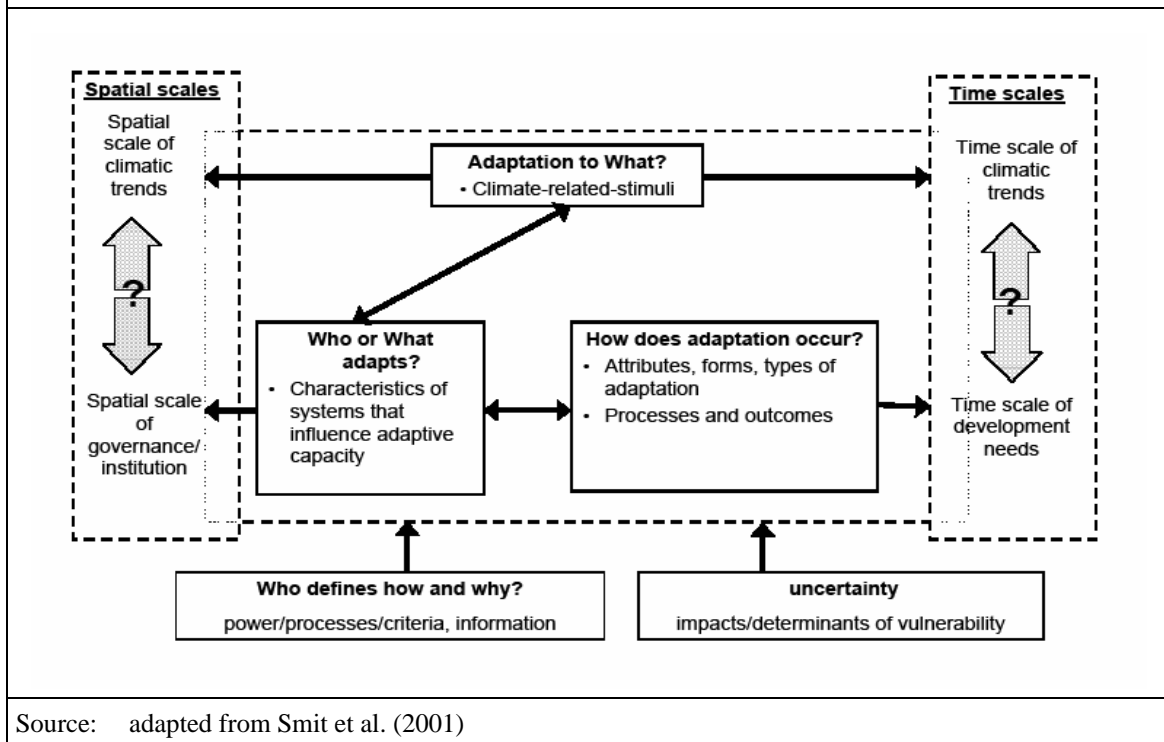
O’Brien et al. compare the challenge of adaptation to globalization or political instability and describe adaptation as a “wicked problem”, “where answers are incomplete, contradictory and set against changing requirements”. The “wicked problem” is described by the following characteristics:

1. *“There is no definite formulation of the problem.*
2. *There is no exit strategy from the problem.*
3. *Answers are not true or false, but better or worse.*
4. *There is no immediate solution and no ultimate test of a solution.*
5. *Any intervention in a wicked problem counts significantly because there is no opportunity to learn by trial and error.*
6. *Wicked problems do not have a well-defined set of potential solutions.*
7. *Every wicked problem is unique.*
8. *Every wicked problem is a symptom of another wicked problem.*
9. *The logic of explanation of a wicked problem determines the solution.*
10. *Planners must be liable for the actions they generate in responding to a wicked problem.”*

Source: O’Brien et al. (2008, 198, citing Richey 2007)

There is no concept-inherent, pre-given definition of a problem, and hence a solution, of adaptation. This implies that the challenge for adaptation planning and addressing it in institutions lies in the definition of the problem itself, in narrowing it down to what adaptation means in a specific context. This refers to the definition of the question of a) adaptation to what (climate-stimuli), b) who or what adapts (system) and c) how does adaptation occur (attributes, forms, types; see also Figure 1). But it also refers to the definition of the space and time dimension with regard to both the climate-related stimuli and the system. From an institutional perspective, the spatial scale is important as the spatial impact of a climate-related stimuli may not coincide with the spatial scale of the institutional influence or governance structure, as is the case for cross-border phenomena, for example.

Figure 4: Core characteristics of adaptation



Thus far, the time dimension has not received sufficient attention in either science or policy development. For the implementation of adaptation measures, however, this question is crucial and at the same time extremely challenging. To what time scale of climatic trends should adaptation measures respond, and under what time frame can they be considered as climate change adaptation measures? Answering these questions requires a balanced decision between short- and long-term needs that arise from both a development and a climate change perspective. This decision has to be made with regard to the climate-related information available as well as with regard to planning structures for development activities, for example. The time dimension is also important for the monitoring and evaluation of adaptation measures, a new field of research.

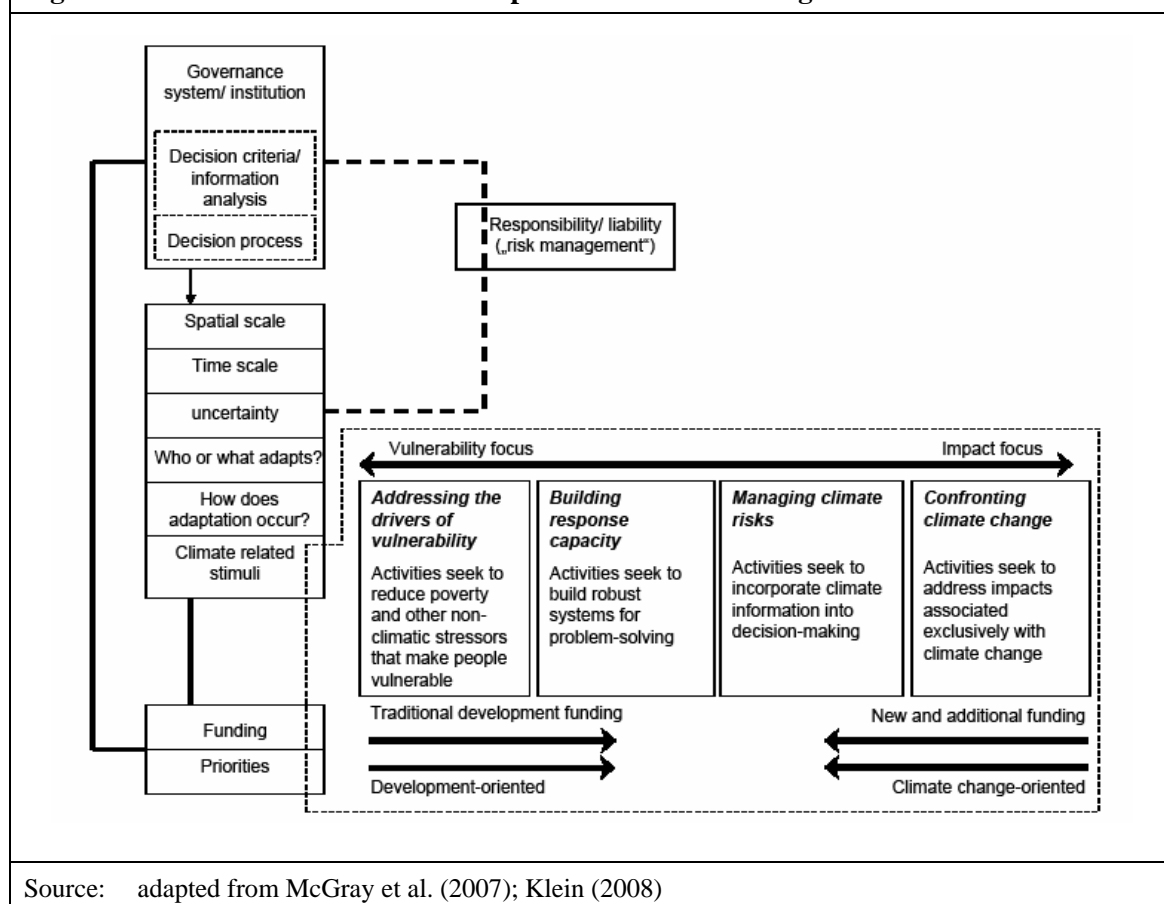
Two further characteristics emerge from the debate that can be considered concept-inherent to adaptation, the “definition challenge” and the uncertainty challenge. Since one of the main challenges in addressing adaptation lies in the definition of the meaning and scope of adaptation itself, the question of “who defines, how and why?” is an important parameter in targeting adaptation. What are the criteria, information and processes on which a decision is based? Targeted action is rendered more complicated by the question of who is vulnerable. If within a country some people are affected by drought and others by floods, what is more important? It is not possible to prioritize adaptation activities on the basis of indicators of vulnerability alone. Using a cost-benefit analysis of adaptation as the basis for decision making also presupposes that the criteria and values used for the analysis are shared within a society. This raises the question of what decision criteria (e. g. cost efficiency or values) and process and power-related questions (e. g. bottom up vs. top-down, central vs. decentralized) adaptation measures should be based on. As there are no common, “objective” criteria of what “good” or “bad” adaptation to climate change is, the decision criteria for adaptation measures need to be embedded in a social and societal context. The “definition challenge” and the fact that there is no such common problem

definition and solution to adaptation highlights the need to generate context-specific analysis and information that can feed into the decision process, and this in itself is a prerequisite for adaptation decisions.

The question of who defines on the basis of what processes and criteria is also critical due to the fact that decisions on adaptation to climate change are inevitably linked to uncertainty. Uncertainty is a dominant feature of adaptation in a twofold way. On the one hand, impacts of climate change are uncertain and there will be no definite information on what to adapt to. On the other hand, there is a degree of uncertainty with regard to the determinants of vulnerability and there is no guarantee that certain measures will lead to reduced vulnerability or enhanced adaptive capacity. Both aspects of uncertainty imply the risk of maladaptation or maladaptedness. As regards institution building, this raises the question of how to address the question of responsibility or even liability (or “risk management” in a broad sense) if adaptation fails.

The “definition challenge” as well as the challenges emerging from the characteristic of uncertainty highlight the need for a socially embedded, representative frame of adaptation in institution building. For building an institutional framework across scale, this suggests that the subsidiarity principle should be applied. The respective adaptation frame for building institutions should be as concise as possible and as broad as necessary to allow for consideration of risk perception, problems or needs definition by lower governance entities. There seems to be agreement that the climate-related stimuli that need to be defined for an institutional action frame can be understood as a continuum extending from

Figure 5: Institutional frame for adaptation to climate change



vulnerability to impact-oriented approaches that allow for different entry points for action. This decision is influenced by the overall priority of the institution (compare Figure 5), as is the case in the UNFCCC for example.

7 Conclusions

The analysis has shown that the important influencing factors for framing adaptation include scientific knowledge about the impacts of climate change, risk perception and practical needs with regard to implementation. Throughout the 1990s, climate change was perceived primarily as a question of climate protection, and the reduction of greenhouse gas emissions was the main problem to be solved on both the political and scientific agenda. Climate change and the related question of adaptation were mainly seen as an environmental issue and a climate protection issue. This heavily influenced methodological and practical approaches to adaptation, which were defined from an impact-oriented perspective. Solutions for adaptation were seen rather as technical in nature and as a response to a change in climate which was expected to take place in the future. The strategies derived for adaptation focused on improving knowledge about the magnitude and expected impacts of climate change. The impact-oriented approach had a major effect on the adaptation framework under the UNFCCC.

The need and priority for developing countries to start out on action from current vulnerability as well as scientific advances in the understanding of climate change impacts has led to a shift in the framing of adaptation. Adaptation to climate change, but also mitigation of climate change, is increasingly perceived as a development issue. The Marrakech Accords of 2001 and the publication of the third IPCC report can be regarded as the main turning point for a broadening of the conceptual understanding of adaptation at the global level.

The concept of adaptation, as framed in the three main fora analyzed, remains broad and vague. Nevertheless, there are important core characteristics of adaptation that emerge from the process of framing and reframing and can be considered concept-inherent and need to be given consideration in institution building (see Chapter 6). What are the implications of these core characteristics for the adaptation framework under the UNFCCC? Several aspects should be considered:

Reframing climate change – differentiating between adaptation and development

While the Bali Action Plan embraces both the impact- and the vulnerability-based approach to adaptation, it remains to be seen to what extent this will finally be reflected in the institutional arrangement under the follow-up agreement, especially the funding mechanisms. One of the main challenges is the implied difficulty of differentiating between general development activities and adaptation to climate change. The vulnerability-based approach stands, to a certain extent, in contradiction to the catalytic function in problem solving at the global level due to its significant overlap with general development. The impact-oriented approach, however, contradicts the conceptual basis of adequate adaptation and adaptation needs adopted by many developing countries. Furthermore, there seem to be contradictions in the political arguments advanced. Industrialized and donor countries call for a mainstreaming approach - which poses a challenge for

proving additionality of funds - but at the same time, they may not be willing to agree on extra funding for development measures not closely related to climate change. Many developing countries stress the need to differentiate between general development needs and needs related to climate change vulnerability in order to highlight the need for additional funds. At the same time, however, they are in favour of a vulnerability approach that includes current climate variability when it comes to funding.

The possibility of addressing adaptation from a perspective of vulnerability to current climate variability has been stressed by scientists as an important entry point for adaptation to long-term climate change. Due to the close interlinkage between adaptation and development, some scholars have even questioned the appropriateness of the UNFCCC as an adequate policy framework, pointing to the need for policy coherence and institutional coordination across a wide range of multilateral agreements (e. g. Schipper 2006). The question of task sharing for adaptation at the global level - and the concrete shape it might be given - is an open one.

In view of the impact- as well as the vulnerability-based approach, the concept of adaptation in the future adaptation framework also relates to a reframing of “anthropogenic climate change” and the meaning of “effects” to be addressed under the convention. In the 1990s, the question of what could be considered “the anthropogenic share” of climate change was decisive for framing adaptation, and especially funding. The GEF’s incremental cost criteria point to the methodological and practical difficulties this implies in trying to come to a concrete definition and basis for funding. The question now is to what extent current climate variability can be regarded as part of anthropogenic climate change.

This adds even further complexity to the discussion. In this respect, it seems rather unlikely that agreement will be reached on a clear definition of adaptation at the global level as well as on what, accordingly, can be considered as additional costs of adaptation or as additional funding for adaptation. One exit strategy could be to define the additionality of funds according to the source of funding, whether, for example, this funding comes from new financing mechanisms such as a levy or auctioning.

Reconsider the conceptual adaptation frame of funding mechanisms

The convention text conceptualizes adaptation in response to anthropogenic climate change. This is reflected by the institutional provisions under the convention and funding under the GEF Trust Fund. The need to demonstrate incremental costs and generate global benefits has proved to be an obstacle in accessing funds and meeting developing countries’ needs and should therefore no longer serve as a funding criteria for adaptation projects. As it is difficult to differentiate between development-oriented measures and extra costs due to activities taking place under a climate change scenario, the ‘additional cost’ principle of the LDCF and SCCF should also be reconsidered based on current funding experience.

Due to the “definition challenge”, the question of who defines what adaptation means on the basis of what processes and criteria, future funding mechanisms should adopt a process-oriented and country-driven understanding of adaptation as in the case of the Adaptation Fund, for example. It leaves the definition of the scope and meaning of adaptation measures to the country level. Funding criteria should embrace an impact- as well as

a vulnerability-based approach to adaptation. The governance structure of an adaptation funding mechanism under the UNFCCC needs to have a representative approach.

Process orientation and country-drivenness

Since it is not possible to define adaptation at the global level, a future framework on adaptation should not mandate any particular adaptation policies. Instead, it should retain the procedural approach and commitment to adaptation. Such an approach would permit the establishment of country-driven processes for the identification and implementation of adaptation along the lines of the core characteristics of adaptation.

Strengthen the generation of context-specific information and analysis

The implementation of adaptation measures is based on the definition of the meaning and scope of adaptation in a specific context. The generation of context-specific information and analysis therefore needs to be strengthened. The UNFCCC currently provides a platform for the exchange of knowledge and experience through the Nairobi Work Programme, which, though, is set to end in 2010. The UNFCCC should therefore reconsider how best to facilitate and support the generation of context-specific information and (scientific/political) analysis. Regional centres and networks on adaptation, which have been proposed in negotiations (e. g. decision 5/CP.7, FCCC/CP2001/13/Add.1), could be a step in this direction.

Address uncertainty and responsibility

Uncertainty in responding to the effects of climate change and related questions of responsibility for the case that adaptation should fail are currently not being addressed sufficiently at the global level. To reduce the risks of climate change impacts and the adaptation burden, the future adaptation framework therefore also needs an ambitious framework for mitigation as a means of attacking the root cause.

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