

MINDMADE POLITICS: The Role of Cognition in Global Climate Change Governance

by

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AUTHOR'S DECLARATION

I hereby declare that I am the sole author of this thesis. This is a true copy of the thesis, including any required final revisions, as accepted by my examiners.

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ABSTRACT

This dissertation explores the role of cognition—the elements, structures and processes of individual and collective thought—in finding effective, cooperative solutions to climate change. It makes three contributions—theoretical, empirical, and methodological—to international relations scholarship. First, it explores cognition as a significant variable in international political life, developing an analytical framework that not only links a cognitive framework of analysis to major IR theories but bridges current theoretical divides between rationalism and constructivism. Second, by identifying and visualizing current belief systems of participants in global climate negotiations, the thesis offers insights regarding cognitive obstacles to multilateral cooperation. The most important obstacle is a clash of substantively and emotionally different belief systems. Depending on the specific constellation of a person’s beliefs about collective identity, perceptions of climate-change threat, and associated emotions, some belief systems contain normative beliefs about justice (i.e., a dominant logic of appropriateness), while others do not. The latter belief systems reflect the national-interest logic of consequences. Focusing in particular on the “wicked” characteristics of climate change, the analysis further reveals a neglect of scientific knowledge (in particular knowledge of the possibility of climate tipping points), a serious undervaluation of the distant future, and perceptions of a number of constraints on agency, some of which cannot be resolved within the negotiations. The study also identifies six distinct belief systems among climate negotiators, which I label *The International Community*, *A Minilateral Club*, *The Market*, *Individuals*, *The Developed World*, and *The Irresponsible West*. The key element distinguishing these belief systems is actor type, which affects problem definitions, proposed solutions, political strategies, and more generally an actor’s role in global climate governance. Third, this dissertation expands the methodological toolbox available to IR scholars by demonstrating the value and synergistic power of cognitive-affective mapping and Q Method. These are powerful tools to reveal individual and collective belief systems respectively.

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DEDICATION

To the unborn children of my generation. Because they deserve better.

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LIST OF ABBREVIATIONS

AILAC	Association of Independent Latin American and Caribbean States
ALBA	Bolivarian Alliance for the Peoples of Our America
AOSIS	Alliance of Small Island States
BASIC	Brazil, South Africa, India and China
CAF	Collective Action Frame
CAM	Cognitive-Affective Map
CBA	Cost-benefit Analysis
CO ₂	Carbon Dioxide
COP	Conference of the Parties
CRI	Global Climate Risk Index
CRN	Coalition of Rainforest Nations
CVM	Climate Vulnerability Monitor
EIG	Environmental Integrity Group
EU	European Union
EVI	Environment Vulnerability Index
GAIN	Global Adaptation Index
GDP	Gross Domestic Product
G20	The Group of 20
G77	The Group of 77
GG	Global Governance
GHG	Greenhouse-Gas Emissions
IPCC	Intergovernmental Panel on Climate Change
IR	International Relations
LDC	Least Developed Country
LULUCF	Land-use and Land-use Change
NGO	Non-governmental Organization
PCA	Principle Component Analysis
SIDS	Small Island Developing States
SVA	Structural Vulnerability Assessment

UN	United Nations
UNEP	United Nations Environment Program
UNFCCC	United Nations Framework Convention on Climate Change
US	United States
VI-CRED	Climate and Regional Economics of Development's Vulnerability Index

CHAPTER 1

Introduction

*"Insanity is doing the same thing over and over again but expecting different results."
(Rita Mae Brown, 1983)*

After more than 20 years of failed diplomatic efforts under the United Nations Framework Convention on Climate Change (UNFCCC) one might conclude that international cooperation on climate change is a hopeless endeavor—another Conference of the Parties (COP) would be a waste of time, money and greenhouse gases (GHG). Is it insane to keep negotiating climate change, expecting different results from the same diplomatic tools? Or are there yet undiscovered levers for changing the political dynamics? And is it insane to keep studying the issue, expecting different insights from the same theoretical approaches? Or are there yet unexplored, more productive lenses?

The continuing disputes over climate policies at all levels of governance are slowly diminishing not only existing optimism that an effective global deal can be struck, but also the collective ability of the international community to contain climate change within ‘non-dangerous’ limits. Given the nature of the climate problem this collective ability is a moving target (Stocker 2013). With more time passing without effective climate policies, both the potential impacts of climate change, and humanity’s abilities to address this problem—through mitigation, adaptation or geoengineering—are changing, most likely declining (Rogelj et al. 2013).

This situation raises a fundamental question for a student of international politics: What are the conditions for multilateral cooperation on climate change? Much scholarship has been devoted to this issue, offering competing explanations for the absence of cooperation without

providing much guidance for overcoming the obstacles identified. Defining climate change as a collective action problem subject to Hardin's 'tragedy of the commons' (Hardin 1968) non-cooperation is explained by reference to a rationally unwilling hegemon (Falkner 2006; Sunstein 2007), hegemonic rivalry (Paterson 2009), or the lack of a hegemon (Hampson 1989), a regime complex (Keohane and Victor 2011), regime fragmentation (Zelli 2011), regime ossification (Depledge 2006), or different perceptions of justice across the North-South divide (Roberts and Parks 2006). The key problem from a neorealist and neoliberal institutionalist perspective is structural—power differences and economic interests favor inaction. From a social constructivist perspective climate change is an issue of justice, based on ideas of North-South relations, exploitation and responsibility. Since the structural conditions appear unchangeable on a policy-relevant time scale and it remains unclear how to untie the Gordian equity knot, scholars of international relations (IR) are shifting their attention from the problem of elusive state cooperation to a more descriptive analysis of non-state actors (Schroeder and Lovell 2012) and bottom-up solutions (Betsill and Bulkeley 2006; Pattberg and Stripple 2008; Betsill and Corell 2011; Hoffmann 2011).

While such theoretical pluralism is desirable when exploring a new problem, its inconclusiveness and inadequate provision of policy guidance is frustrating from a practical perspective. Relying on existing explanations of failure rather than devising strategies for success is also passive and pessimistic, and does not realize the full potential of IR scholarship, which should aspire to improve international politics and its outcomes. Finally, while the theories seem to explain the observed reality of non-cooperation, most of the existing research relies on assumptions about the interests and beliefs of actors that have not been empirically validated.

IR Seems to have reached a theoretical and empirical boundary this dissertation seeks to push out a little further. Moving beyond static-descriptive work I am interested in an emancipatory approach—developing a type of knowledge that can facilitate change. The necessary starting point for this endeavor is the place where I believe all change starts: in the mind.

I. A COGNITIVE APPROACH TO INTERNATIONAL RELATIONS

Human behavior is often purposeful. People act to achieve certain goals, such as protection from harm, generation of wealth, or relief of human suffering. Goal-directedness can give actions meaning (Schelling 1978, 17–19). IR theory attributes the ability to act purposefully to collective actors, including states, terrorist networks, transnational NGOs or epistemic communities. Collective behavior requires shared beliefs about the things that exist and about causality, as well as ways and means to change these shared beliefs over time. However, IR theory has remained uninterested in the mental processes—individual or collective—that create these shared beliefs, and instead has focused on what people do. Even social constructivists, who emphasize the importance of inter-subjectivity, shy away from the analysis of cognitive processes in favor of analyzing the causal role of ideas.

Taking constructivism seriously, there should be multiple possibilities to interpret and respond to the current material structure, which is believed to be the key obstacle to cooperation by most theorists and practitioners dealing with climate change politics and governance. The material structure refers to the current distribution of tangible sources of power among all units of the system—states, including their military might, economic power, and geographic features like territory and natural resources. From a constructivist perspective agents should be able to choose responses rather than being structurally forced into their current perceptions

of interests and identities (Wendt 1992). However, it remains unclear what alternative interpretations of the given system structure are possible, and how a change in identities, beliefs or norms that could sustain such alternatives could be brought about. So far there is no detailed analysis of how individuals (persons rather than states) think about their interests—individual or collective - in the context of the climate change problem, what they believe to be the applicable norms, and what they perceive to be requirements for cooperation. It is unclear whether state representatives in fact have rational thoughts about costs and benefits or structural threats and opportunities, normative considerations of historical responsibility and justice, or a combination of these. If different individuals hold fundamentally different beliefs, how do they differ and why?

This is a lacuna—both empirical and theoretical—that this study begins to fill. Identifying what political actors believe today, this study offers unique views into the cognitive reasons for non-cooperation on climate policy that extend beyond the theoretical explanations offered by IR scholarship so far. This research explores the role of cognition—the elements, structures and processes of individual and collective thought—for finding effective, cooperative solutions to climate change. The central research question is:

What cognitive elements and processes promote or inhibit cooperation to achieve effective responses to climate change?

The subjects of inquiry are thoughts and beliefs of individuals and groups, not their sources (e.g., system structure) or their consequences (e.g., decisions, behavior). This focus on the mental mechanisms connecting decision-relevant factors and the observed political behavior differentiates my research from previous work on climate politics but also IR scholarship more generally.

Given the interest of cognitive analysis in ideas, in other words, the conceptual content of beliefs, it is important to understand how it differs in particular from social constructivism. Social constructivist theories have sought to counter structural theories with the argument that ideas matter, and have accorded causal power to various kinds of ideas. Ideas themselves are believed to produce or at least influence political outcomes. The distinct causal assumption of a cognitive approach is that agents rather than ideas produce political outcomes. An agent is motivated by a specific belief system that provides both the foundation and constraints for political decision-making. Further, ideas and beliefs can be understood as the results of brain processes rooted in the biological functions of the human body. Cognition is therefore best understood as a set of observable actor-level processes that bridge the material-social world and its given ideational structure (cognitive input) on the one side and political decisions and behavior (cognitive output) on the other. A gate might serve as a useful metaphor: cognition can be conceptualized as the gate through which information about and perceptions of the material and social environment passes in order to lead to a decision or behavior.

Given this bridging or gate-keeping function cognition is not independent of system structure and ideas. Rather it uses available informational resources to enable purposeful and meaningful action. Sometimes cognition creates systemic novelty: the cognitive processes of different individuals can produce different and sometimes unexpected results. Small differences in the set up of the ‘mental machinery’ within the individual brain at a certain point in time can lead to different interpretations of the material or ideational reality and consequently different decisions. Based on this focus on the mind, a cognitive approach is naturally concerned with issues of agency, intention formation, identity, and the links between thoughts, actions and political outcomes.

The cognitive approach is not a rival theory to IR's 'big three'—neorealism, neoliberal institutionalism, and social constructivism—but a complementary perspective that is able to speak to existing work and even integrate past insights across different theoretical schools. Identifying parts of the cognitive status quo in global climate politics—the cognitive system structure if you will—this research also provides the foundation for change—change that begins in the mind.

Three conceptions of cognition that are not without contention heavily shape my work. All of these issues will be explored in more detail in Chapter 2. First, adopting the dominant view among cognitive scientists, I reject mind-brain duality and conceive of mental processes as brain processes, rooted in neural activity, chemistry and more generally biological functions of the human body. Second, I argue that there is an intimate connection between cognition and emotion and reject the separation of the cognitive and affective systems. While the emphasis on emotions for human thought and choice has a long history (e.g., Hume's sentimentalism), the subject has so far had very little relevance in IR scholarship. One of the reasons for this neglect might have been the lack of tools and methods to analyze emotional phenomena. With this research project I make some progress on both fronts, acknowledging emotions in my theoretical framework and experimenting with new methods to make emotions empirically tractable. Third, I suggest that cognition is best understood in complex system terms. Rather than looking at individual cognitive elements such as distinct beliefs, theories of cognition need to address the relationship between individual cognitive elements and larger system dynamics. One can describe sets of cognitive elements and their links as networks of meaning, such as political ideologies (Jost, Nosek, and Gosling 2008) and frames (Nelson; Benford and Snow 2000), problem-specific or conflict narratives (Smith 2007), or social dis-

courses (Maguire 2004). This project is concerned with specific networks of meaning that are a subset of the beliefs of a specific group of individuals: the belief systems of participants in the global climate negotiations about climate change and multilateral cooperation.

The rationale for focusing on cognition is supported and contextualized by four distinct scholarly developments outside the field of IR.

(1) A growing number of scholars in other social science disciplines (e.g., social psychology, communication and decision sciences) are turning their attention to the analysis of cognitive barriers to engagement with climate change at the level of citizens, ideological groups, or local communities. Key questions of this research include the role of emotions (Lorenzoni et al. 2006; Wolf and Moser 2011; Roeser 2012), cultural elements (Kahan, Jenkins-Smith, and Braman 2011; Leiserowitz in Moser and Dilling 2007, chap. 2), ideologies (Weber 2010; Antilla 2005; McCright and Dunlap 2000), communicative strategies including the use of imagery (O'Neill et al. 2013), and physical experience of climatic events (Dessai et al. 2004; Spence et al. 2011) as factors in shaping individual responses to and public opinion on climate change (Norgaard 2006b; Norgaard 2011). Shifting from 'lack of information'- and 'lack of concern'-explanations to more complex processes in the human mind, this body of work is creating important insights regarding the cognitive barriers to bottom-up, political mobilization for climate change action. It has important implications for domestic political processes and can be used to improve national and sub-national policy-making. However, its relevance for understanding the UN negotiation process is limited to indirect effects, for instance, the impact of climate skepticism in the US on the international climate science community and the functioning of the IPCC, or the role of cognitive barriers to climate action in the emer-

gence, strategies and effectiveness of transnational NGOs that participate in the UNFCCC proceedings.

(2) There is an increasing academic interest in the history of ideas (Heymann 2010; Jaeger and Jaeger 2010; Weart 2010), the role of different forms of knowledge (Lahsen 2010), and imagination (Yusoff and Gabrys 2011) in the context of climate change. The underlying assumption of these studies is that ideas—rather than structures or economic power—can shape governance institutions, social structures and individual lives. More importantly, when ideas change, they change the institutions built around them. Key issues when exploring the role of ideas for climate governance have included the formulation in Article 2 of the UNFCCC, which states that the goal of the Convention is to “... prevent dangerous anthropogenic interference with the climate system” (Lowe and Lorenzoni 2007; Lenton 2011a), and the political agreement formalized at the Copenhagen summit of keeping the global average temperature increase below 2°C (Randalls 2010; Jaeger and Jaeger 2010; Bellamy and Hulme 2011). This work raises important questions regarding political actors’ tendencies and abilities to use different ideas in their efforts to create a climate governance regime.

(3) Over the last two decades there have been notable advances in the cognitive sciences, including the neurosciences, in understanding human thinking and the inextricable link between cognition and emotion (Damasio 1995; Thagard 2006; Moser in Moser and Dilling 2007, chap. 3). This has been accompanied by the development of computational tools for the study of cognition, including agent-based models (Lustick and Miodownik 2009), neural network models (Thagard 2006), automated text analysis, and cognitive-affective mapping (Findlay and Thagard 2012). So far, with a few notable exceptions (Mercer 2005a; Mercer 2010; Moisi 2009; Sasley 2011; McDoom 2012) these advances have hardly been utilized in

the analysis of global politics. Despite the availability of novel tools and research strategies there are no studies that explore the role of cognition and emotion in multilateral climate change negotiations.

(4) Climate change has given rise to a small body of research on wicked problems and the associated questions of how to address problems in this special category, that presumably are not open to standard political responses (Verweij et al. 2006; Levin et al. 2009; Prins et al. 2010; Levin et al. 2012). The different characteristics of wickedness and many issues regarding the appropriate social responses to these characteristics remain contested. Do political actors recognize these special problem characteristics? How do they acquire relevant knowledge and how does this knowledge affect their beliefs about governance and cooperation?

Taken together, these findings suggest that focusing on the role of cognition in the analysis of international climate politics can generate significant new insights. Investigating cognitive processes of individuals and groups that take part in international political processes—diplomats, NGO and private sector representatives—raises important questions regarding the nature, content and specific characteristics of their thought patterns in contrast to the cognitive responses of citizens and domestic political actors.

Critics might argue that a cognitive approach is too reductionist because it claims that all political phenomena can be traced back to individual psychology. The previous paragraphs have already begun to counter the reductionist challenge, outlining a definition of cognition that integrates individual brain processes with a range of material and social factors (cognitive input variables) as well as political decisions and behavior (cognitive output variables). Instead of being reductionist, this cognitive approach is systemic, viewing cognitive processes

as elements in larger social-material systems with important transmitter functions between system conditions and political behavior.

Second, rather than seeking to explain political phenomena with individual thought processes, this cognitive approach places emphasis on the relationship between individual and collective cognitive processes, what I call the *person-group problem* (PGP). The ontological status of collective cognitions is a major problem with importance across several social science disciplines. IR not only treats the state as a unitary actor but also often implicitly assumes the thinking state. In contrast a cognitive approach distinguishes between the individual and group-level of analysis, offering tools to explore this relationship between multiple levels.

Nevertheless, one could still fundamentally question the value of a focus on individual minds because such an approach fails to acknowledge the relevance of all social processes, conditions and institutions that might have created these beliefs. If one assumes, like Mary Douglas does (Douglas 1986), that ‘the social’ is prior to individual cognitive processes, and in fact shapes and determines individual thought, then a focus on individual minds would seem futile – it would confuse the independent and dependent variables.

However, neither the individual mind nor the social mind should be prioritized. Rather than focusing on one or the other, the interaction and mutual interdependence between the individual mind and the social environment are key for understanding existing beliefs and belief dynamics. It is unclear how much cognitive “freedom” or self-determination rests with the individual, and to what extent a person’s belief have been received from the social environment or even imposed by it. But even when acknowledging the crucial interactions between the individual and the social, I argue that much can be gained from using the individual mind as an entry point to the analysis. Most importantly, the rules that apply to the individual brain

condition what types of belief systems are possible, and those constraints also apply to shared or collective beliefs. Further, understanding individual cognitive processes allows the researcher to understand how social processes affect individual beliefs – which ideas are adopted or rejected and why. Finally, a focus on social factors cannot explain how these social phenomena came into existence in the first place – every institution, practice or ideology had to start in an individual mind. Individual minds are also relevant for triggering processes that can change existing social structures. Consequently a focus on cognition, defined as individual brain processes, offers potentially valuable insights that cannot be gained with a focus on ‘the social’.

II. THEORETICAL APPROACH

This is an explorative study that aims to gather initial empirical insights to support theory-building efforts. The project investigates current cognitive patterns among political actors engaged in multilateral negotiations to create a global climate change governance regime. Below I outline the conceptual framework for answering the main research question:

What cognitive elements and processes promote or inhibit cooperation to achieve effective responses to climate change?

This question raises two distinct two sub-issues. First, how can one describe the current cognitive reality, in other words, what are the most important and maybe most common cognitive elements and processes in the minds of climate change negotiators? Second, how do these cognitive patterns impact ongoing political efforts to create a cooperative multilateral agreement on climate change?

1. Cognitive Elements and Processes

Is it possible to identify types of cognitive elements (e.g., concepts, beliefs) or processes (e.g., risk assessments) that are recurrent in the belief systems of different individuals with different views on global climate governance? I distinguish two types of cognitive elements and processes: (a) general elements that are essential for an actor's thinking about any issue in a multilateral political setting, for example, an actor's self-representation, concepts regarding other actors or regarding the relevant structural and normative context, and (b) elements and processes that are specific to climate change and are not expected to play a major role in other political contexts, for instance, an actor's mental representations of special problem characteristics such as climate tipping points. Concerning general elements (a) I focus on mental representations concerning structural constraint and agency, identity and justice, reflecting well-known theoretical categories in IR scholarship. Assuming that these three broad categories are essential cognitive elements across various political situations – individuals cannot make sense of reality without using these categories – I call these meta-concepts.

2. Influence on International Cooperation

Do these two groups of cognitive elements and processes—especially the interaction between meta-concepts and the special characteristics of climate change—have any discernible effect on actors' ability to develop cooperative responses to climate change? In other words, what types of concepts and thought processes are relevant for (non-)cooperative decisions of climate change negotiators?

3. Initial Hypothesis

I approached the research question in three steps, each guided by an initial hypothesis: (1) identification of relevant concepts and concept categories for individual and collective decision-making, (2) qualitative exploration of the cognitive effects of a set of special characteristics of climate change, (3) analysis of the interactive effect of (1) and (2) on the ability of international policy-makers to agree on effective, cooperative solutions to climate change.

Hypothesis 1: There are at least three types of (meta-)concepts in the belief systems of climate negotiators that are relevant for the emergence and sustainability of cooperation within the UNFCCC: those related to structural constraints of agency, collective identity, and norms of justice. Combinations of these concepts form coherent cognitive clusters (i.e., belief systems) that provide the foundation for shared beliefs, official negotiation positions, and collective decision-making.

Hypothesis 2: Some characteristics of climate change pose major cognitive obstacles to international cooperation. These include (i) the overwhelming complexity of the problem leading to a sense of hopelessness, (ii) uncertainty and the particular time scales of climate change, requiring long-term thinking in the face of short-term oriented political and ethical decision-making, and (iii) the imperceptibility of climate change for the average person on a daily basis leading to a lack of urgency.

Hypothesis 3: Some special problem characteristics inhibit international cooperation, because they limit both rational decision-making and the role of emotion to create a strong motivation for climate action (beliefs about agency). These characteristics include the long problem time scales of climate change, which require the cognitive ability to imagine qualitatively different distant futures (i.e., non-linear change and tipping points) in order to assess the potential costs of non-cooperation or benefits of cooperation.

Step one is about cognition in international decision-making generally—what are the relevant concepts? Step two is issue-specific, asking whether the general cognitive features are influenced by the nature of the problem at hand. Step three explores the relevance of these basic insights for the chances of international cooperation.

III. METHODOLOGY: NEW AND ESTABLISHED TOOLS TO EXPLORE SUBJECTIVITY

In contrast to more conventional research designs this project seeks to identify, visualize, and analyze subjectivity rather than material variables or behavior. To this end I deploy two complementary methodological tools: cognitive-affective mapping and Q method. These two instruments served to identify the content and structure of participants' belief system at the time of the interview or Q sort in the spring and summer of 2012. First, I developed 55 cognitive-affective maps (CAMs) based on semi-structured interviews to generate insights into the views of specific individuals at particular point in time ('cognitive snapshots'). The CAM reflect the substance of the interview transcripts, using exclusively the language and terminology offered by study participants. Second, I conducted a Q study with a self-selected subset of this participant group to identify different ideal-type belief systems (factors) that are shared by a number of individuals. The Q study took place several months after the initial interview with the study participants. All 55 study participants who had been interviewed were invited to the Q study; 28 decided to participate. The Q sort ran on an online platform and did not involve any face-to-face interaction or follow-up interview between the participants and myself. Cognitive-affective mapping and Q method are independent research instruments, but as I will describe in more detail in chapter 5, the results complement each other. Before highlighting some of the key features that made these two methodological approaches very well suited to pursue my research questions, I provide a rationale for working with participants in the global climate negotiations, especially diplomats representing states in the UNFCCC.

1. Working with Diplomats

Investigating the private beliefs of diplomats (international negotiators) rather than those of their political masters within national governments has major advantages, but also some serious drawbacks that place important limitations on the conclusions that can be drawn from this research. A central issue for this discussion is the fundamental distinction between private beliefs and public preferences or negotiation positions (Feldman 1988; Hamm, Miller, and Ling 1992; Niemeyer 2011). The key question is whether there is any utility in exploring the beliefs of negotiators, who could be considered as mere messengers of their domestic political masters and therefore powerless executors of mandates in the creation of a cooperative agreement between states. Below I present three arguments why working with diplomats is both useful and necessary for the purpose of this project and offered unique advantages over other possible participant groups and methodological possibilities.

(1) I assume that the beliefs of individual negotiators contain the *most detailed and rich points of view* regarding the global aspects of the climate challenge, and they can differ from the beliefs of domestic actors due to negotiators' unique experience of climate change as a governance challenge. Diplomats have a deep comprehension of the issue because it is their job and professional responsibility to address climate change in a multilateral setting. They have maximum access to the evolving scientific information, they are frequently exposed to the views of other global actors, and they have to present and justify their national position in a coherent manner continuously. This constant exposure to other actors' views is a unique element that expands the perspectives of diplomats—the range of ideas and arguments they have to consider and respond to. At the same time these unique features can also lead to narrow understandings of the climate problem, perceived purely in multilateral treaty terms and

divorced from on-the-ground realities. Diplomats are also the links between domestic and the international political processes, making their cognitive reality crucial for the cross-scale interactions. They are a two-way communication channel, relaying a domestic message to the international community and carrying decisions, questions and tasks from the multilateral forum into the domestic political sphere. Because of these specific circumstances the beliefs of negotiators should be more comprehensive and sensitive to global complexities than those of domestic political actors, who are not required to take all those elements into account. Further, diplomats focus on the multilateral context, which is subject of this study, rather than the domestic politics of climate change. This global political debate is different than the domestic one; it has not only different participants, but also different conceptual elements, processes and technicalities. Finally, the ‘lifeworld’ (Habermas 1985) of negotiators is shaped by their continuous interaction in varying negotiation settings—massive conferences attended by several thousand people, moving between plenary sessions, contact groups, drafts of bracketed texts, interactions with civil society observers, and lots of travel time—and the rhythm of moving between this multilateral setting and the domestic politics. In short, the set of global-level discourses on climate change and cooperation differs from domestic discourses, although naturally there will be major overlap between the different system scales.

(2) Importantly, the belief systems of climate negotiators contain what one could call the *current possibility space of problem definitions and solutions* that human beings are capable of conceiving. This study reveals belief systems that are possible, whether or not they are publicly revealed in the form of negotiation positions. Private beliefs of diplomats can differ significantly from the official negotiation position the individual presents in the UNFCCC context, but his or her point of view is a valid point of view for a person with that nationality.

These private views have been shaped by the same multiplicity of social, political and cultural factors that influence domestic decision-makers, but are also subject to an additional global set of influences. Therefore investigating the private beliefs of climate change negotiators leads to a more complete understanding of the landscape of possible ways of thinking about and responding to climate change. This very basic insight contributes to our understanding of the nature of belief systems, their content and structure. It also allows us to stipulate features of the belief systems that could be successful in domestic contexts.

(3) Another useful argument for working with negotiators is the fact that they are *comparable*. The similarity of their roles as representatives of governments in the UNFCCC process ensures the comparability of the viewpoints gathered. A study involving domestic decision-makers would have faced major difficulties in this regard. A multitude of different actors (e.g., various ministries, departments, agencies, industry players, parliamentarians) is involved in the process of determining negotiation positions or national climate policies. The relevant set of actors would have differed across countries, making a useful comparison difficult, if not impossible. In addition, the domestic landscape of discourses is likely to be so different that it would have been very difficult to implement a Q study (see chapter 5).

But aren't the subjective views of diplomats irrelevant? Diplomats are constrained by negotiation mandates that provide clear and insurmountable constraints on their positions; it simply does not matter what these individuals think. Yet, as I have already argued, we can learn a lot from the private beliefs of diplomats regarding the nature (i.e., content and structure) and the existing possibility space of belief systems on this topic. Further, in the case of small and developing states, delegation heads (often the state's Ambassador to the United Nations in New York) often have significant freedom to determine their country's negotiation

position and climate change response strategy more generally. Their personal beliefs tend to overlap strongly, if not completely, with what they state in the formal negotiation process.

Finally, it is not the goal of this study to improve the clearly limited power of negotiators to create a cooperative agreement. Rather, my goal is to understand the nature of existing beliefs and their relevance for multilateral cooperation, assuming that these would be valid viewpoints in political debates and that there is a possibility of engaging domestic political audiences based on these viewpoints.

In summary, studying the private beliefs of diplomats is valuable for three reasons. First, these beliefs are the most relevant but also the most specific and detailed with respect to the subject of this study: the global aspects of climate change governance. Second, the beliefs of negotiators contain the current possibility space of solutions to climate change that humans are capable of perceiving, which contains potential lessons about the nature of cognition. Third, working with diplomats enables a rigorous cross-national comparison of viewpoints that would not be possible when working with domestic political actors.

2. Gathering Data—Identifying Cognitive Reality

Cognitive-Affective Mapping is a tool to identify, visualize and analyze individuals' belief content and structure. A cognitive-affective map (CAM) is a network diagram or concept graph that “displays not only the conceptual structure of people's views, but also their emotional nature, showing the positive and negative values attached to concepts and goals” (Thagard 2012).¹ The participant CAMs were analyzed to answer the following questions:

- What are the most relevant concepts?

¹ The process for generating and analyzing CAMs is described in detail in Chapter 3, pp. 74 ff.

- Are there any regularities regarding the type of existing concepts/beliefs across CAMs of individuals with very different views?
- How do these concepts reflect the cognitive expectations of IR theory, for instance, are there concepts regarding national interests, cost-benefit calculations and structural analysis more generally, actor identities, or norms, especially norms regarding international justice? If multiple types of concepts exist, how do they relate to each other? Is there a hierarchy among them?
- What role do the special characteristics of climate change play in the belief systems of individual negotiators?

Q method (Brown 1980) is a well-established tool to identify different viewpoints (‘factors’) on a certain subject matter in a group of individuals. In a Q sort participants attribute their own, personal meaning to a set of statements they are asked to rank-order, thereby revealing their individual belief structure. By correlating individuals (rather than objective traits), a Q sort provides information about similarities and differences in the structured beliefs of groups of people. Conventional Q methodology only assesses belief structures without paying attention to the associated emotional content. Through small adjustments I added an emphasis on emotional information.

Complementarity of CAM and Q Method: Each of the methods applied here has obvious limitations, but their joint application alleviates many of their individual shortcomings. CAM zooms in on the individual’s cognitive state and allows study participants to present their beliefs using their own language, concepts and arguments. The method maximizes idiosyncratic participant input at the cost of limiting comparability of findings across participants. Q’s focus is on cognitive features that are shared by several individuals. The method sacrifices detailed information about the individual in order to detect collective or shared points of view. The primary advantage of combining the two methods is the generation of complementary insights, comparable to a micro and macro perspective of subjectivity.

Using both tools in conjunction also allows the researchers to synthesize their respective insights. This can advance knowledge in two ways. Observing the reduction of conceptual diversity contained in the CAMs during the scale transition from the individual to the group level, the combination of methods helps to separate ‘popular’ cognitive elements from those that are primarily expressions of individual preferences and personality. Second, uncovering the diversity of beliefs in the form of participant CAMs associated with a shared belief system identified with the help of Q method helps understand the level of ideational plasticity or permissibility of a shared perspective.

Finally, each method works with different constellations of groups of participants, a joint property that can help the researcher understand the demographic features that might be associated with certain belief systems. The CAM analysis required the establishment of groups by the researcher prior to the analysis, even prior to participant recruitment. Q on the other hand allows groups to emerge based on their shared beliefs about the subject matter. The comparison of these groups enabled a set of early insights regarding the nature of existing belief systems, the possibility that parts of belief systems were shared with a number of different groups, and the possibilities for cognitive change.

IV. THE CENTRAL ARGUMENTS

This dissertation develops a spectrum of insights regarding global climate change governance, but at its root is a very basic argument about the power of a cognitive approach to advance the study of international politics. Showing the relevance of basic theories and methodological tools from the cognitive sciences to IR enables researchers to deepen and possibly integrate existing knowledge and to bridge theoretical perspectives often seen as opposing

each other or being mutually exclusive. The following paragraphs briefly summarize some of the most important findings of this study. Most of these have benefitted from and would not have been possible without the bridge-building ability of the cognitive approach.

Applying a cognitive analysis to global climate politics this research bridges structural-rational and constructivist theories, offering initial insights into the utility of these theories for developing a better understanding of the deliberation and decision-making processes of climate negotiators. The most important link between these strands of theory is the interdependence of group identity concepts and risk perceptions, for example, expected cost calculations regarding climate change. Jointly these cognitive entities condition the definition of group interests and determine whether or not these interests are linked to normative justice concerns.

The central elements of all belief systems identified in this study are actor identities and actor groups. All other elements of the belief system, including the nature of the problem at hand, are defined and understood in relation to a specific in-group the individual identifies with. Climate change, the type of risks it poses, the actions necessary to address it, and the moral norms associated with efforts to solve the problem all depend on an actor's vantage point. Put differently, identity conditions an actor's rationality by shaping—enabling and constraining—perceptions of costs and benefits in a given system structure. This insight validates both structural and constructivist theories, but it also emphasizes that a full understanding of political behavior is not possible without reference to both theoretical schools.

One could use the image of sunlight on a landscape to understand this limitation. From the perspective of the sun only parts of the landscape are illuminated or visible at any point in time—the hills, mountainsides and building walls facing the sun receive most light while flat areas that are not in the shadow of a mountain or a house receive some. But many places re-

main invisible. Different belief systems can be understood as different ‘views’ of the landscape in the course of the day as the sun moves across the sky and illuminates different parts.

In addition to identity concepts and risk perceptions (i.e., cost expectations) a third category of mental representations—normative considerations—appears in some belief systems but not others, depending on the constellation of identity group, risk perception and associated emotions. Two major types of belief system can be distinguished. In the first the actor’s in-group is perceived to face existential threats, identity loss, death or grave human suffering. These concerns trigger strong negative emotions and are associated with a normative framework of reasoning that infuses the actor’s negotiation position. IR scholars would call this a belief system with a dominant logic of appropriateness. Given the nature of climate change and its skewed global impacts, the likelihood of having a norm-based belief system increases with the actor’s identification with groups larger than the state, for example, the group of developing countries, the poor, or even humanity. While that might surprise IR scholars, many state representatives do in fact identify with such large groups in addition to their individual and national identity.

The second type of belief system perceives risks of economic costs and other material losses like infrastructure damage, but no threat to human life and wellbeing. In this mental framework the logic of consequences is dominant.

The key to understanding these differences in beliefs are specific identity concepts and risk perceptions of individuals who see themselves as members of different groups, ranging from local communities to the human community. Urgency and support for climate action exists if an actor perceives a certain type of threat to his or her in-group within a relevant temporal timeframe. If any of these three conditions is missing—the person perceives a less severe

type of threat for the in-group today, or an existential threat to another group—the link is broken. When applied to the climate change negotiations in 2012 with the current distribution of impacts and the current belief distribution about future impacts, this observation suggests that that small-island state representatives merely need to have a strong sense of national identity to feel urgency and desire cooperative action (but they tend to have more comprehensive identities), but representatives of wealthy Western democracies need a cosmopolitan identity—humans connected to all humans—for the same cognitive experience.

These insights confirm the first hypothesis stated above: there are in fact certain categories of concepts that structure every belief system. These meta-concepts include collective identities, structural constraints of agency and in a specific subset of belief systems normative elements about justice.

Special characteristics of climate change do not play the role one would expect in shaping the belief systems about climate change governance at the global level. Few special characteristics (e.g., pervasiveness) are acknowledged, but most (e.g., climate tipping points, long time scales) receive too little attention. They are generally not used to motivate arguments about the needed solutions, governance instruments, or goals.

Given the long time scales of climate change and major uncertainties regarding the timing and scale of future change or systemic responses to climate policies, concepts about time are very important for climate change governance. However, the cognitive systems of participants in climate negotiations indicate significant shortcomings or even lack of attention to issues of inter-temporal choice. Individuals interviewed for this study experienced severe cognitive limitations when they were asked to imagine or even seek to influence the distant future. The cognitive mechanisms for dealing with the long-term challenge include avoidance, lack of de-

tail and imagination, and reluctance to acknowledge possibility of failure. Emotions play an important role in these mechanisms, because individuals are not able to feel and anticipate an imagined future with the same intensity that accompanies their memories of the past or their experience of the present. Consequently the distant future is generally undervalued and under-defined in the negotiations and does not have the weight it should have given the unprecedented causal reach of the present generation into the future.

The absence of clear timelines (for impacts, actions, or expected system response to actions) has important implications for the discussion about governance goals and climate regime targets. The 2°C temperature target adopted at the Copenhagen summit in 2009 is not associated with a clear time line, specific actions or milestones. Not able to imagine how the target could be reached and observing the continuous political stalemate within the UNFCCC, many negotiators are already pessimistic regarding their collective ability to reach it. They are in the process of mentally abandoning the temperature target, and replacing it with something that is more certain, under their control and within their collective skill set: a political agreement sometime in the coming years. I argue that the temperature target diminishes beliefs about agency and does not have the motivating force a good goal is supposed to unleash. Its replacement with a political target that is not environmentally effective is an undesirable cognitive response and should give rise to a new discussion about appropriate and effective climate regime targets.

In the scholarship and among practitioners the temperature target is often associated with the goal of the Convention to prevent “dangerous” climate change, specifying this vague goal and enabling practical, measurable steps towards it. This link between 2°C and the term “dangerous” raises interesting questions about possibly fatalist tendencies among climate negotia-

tors—if they no longer believe that that temperature target can be reached, have they given up and accepted that we are failing to prevent dangerous climate change? This study shows that negotiators do not consider the 2°C target as a threshold between a non-dangerous and a dangerous world. Instead they employ linear thinking in the sense that “three degrees is better than five,” and later is better than never. They are able to remain hopeful without any reasons for such optimism.

These insights offer mixed evidence for the second hypothesis guiding this project but clearly confirm the third: some special problem characteristics inhibit international cooperation because they limit rational decision-making and the role of emotion to create a strong motivation for climate action. The special problem characteristics pose cognitive obstacles, but not in the way I hypothesized at the outset of the project. First, climate change is perceived as a complex and uniquely pervasive problem, but this understanding does not lead to a sense of being overwhelmed or paralyzed in the face of this challenge. Instead of experiencing hopelessness, negotiators’ cognitive response to the unsuccessful negotiation dynamics—for example, the replacement of the temperature target with a political goal—allows them to remain optimistic. Second, long-term thinking is indeed challenging for negotiators; yet, they are not actually aware of this being a challenge or cognitive shortcoming. Third, climate change is increasingly observable and already part of the lived experience of many negotiators. Therefore imperceptibility is only a cognitive challenge for a shrinking number of negotiators from developed countries.

In addition to these specific cognitive issues, this study identifies six private belief systems that are prevalent among negotiators in the Umbrella Group, the European Union (EU), some G77 and China members, and a broad range of NGO representatives. I label these *The*

International Community, A Minilateral Club, The Market, Individuals, The Developed World, and The Irresponsible West. These six belief systems share a number of fundamental ideas, but differ in their views on climate change governance. Each perspective focuses on the responsibilities of a different actor group, ranging from individual states, to groups of states to individual human beings. Again, one can distinguish belief systems that are strongly shaped by norms (e.g., international solidarity, the rich help the poor) and those shaped by a logic of costs or consequences.

V. SCHOLARLY CONTRIBUTION AND POLICY RELEVANCE

This project makes a range of contributions to the field of IR and offers policy-relevant insights about the existing belief systems driving contentious political dynamics.

1. Scholarly Contributions

I distinguish three types of scholarly contributions: theoretical, empirical and methodological. Overall the project offers preliminary evidence for the value of a cognitive approach to IR and the utility of existing methods for empirical work in this field. The insights generated with this conceptual and methodological approach cannot be placed in one of the available theoretical boxes of neorealism, neoliberal institutionalisms or constructivism. Neither do they easily fit with previous approaches to political psychology or past cognitive work like George's operational code (George 1969) or image theory (Herrmann et al. 1997), because they are more specific than the former and more general than the latter. However, this research is not disconnected from these existing scholarly traditions, but builds on and speaks to them. In this sense it advances existing knowledge on global climate change governance, the

drivers of political contention, and the constraints of meaningful multilateral cooperation on climate change in the UNFCCC setting.

By identifying the relevance and utility of concepts and theories from the cognitive sciences to the field of international relations, this study makes a genuinely interdisciplinary contribution. Recent advances in one discipline contribute to knowledge generation in another, pushing out some theoretical, empirical and methodological boundaries.

The cognitive approach applied to the case of global climate change governance presents a theoretical-conceptual alternative to the ‘big three’ theoretical traditions within IR. But rather than negating the insights generated by the traditional schools of thought, the cognitive lens is able to use them. What is more, the cognitive analysis has been able to connect structural and ideational theories that have traditionally offered contrasting and opposing arguments. While not the objective of this research, this theoretical bridge building has been productive in the case of climate change politics and might prove similarly useful in other areas of IR scholarship.

In exploring the nature of cognition – the content and structure of belief systems – this research project also deepens scholarly understanding of the causes of non-cooperation in the case of climate change, pointing in particular to a clash of different belief systems, an undervaluation of the distant future, and perceptions of a number of constraints on agency, some of which cannot be resolved within the negotiations. These explanations differ from but complement existing explanations of global climate change politics that concern material power structures and perceptions of justice across the North-South divide. More importantly, by mapping parts of the current cognitive landscape in global climate change negotiations the empirical insights of this work are beginning to reveal potential levers for changing the politi-

cal dynamics surrounding the climate change problem. This emancipatory element—leveraging work on cognition as a tool for political change—will require further research, for example efforts to understand cognitive change processes and the implications of moving up and down the scales of the governance system.

In terms of empirical novelty, this project has investigated mental realities—existing belief systems about multilateral cooperation and climate change—with a special emphasis on the role of wicked problem characteristics. The data have revealed key concepts and mental processes that dominate people’s beliefs about global climate change governance, and to what extent these reflect the assumptions of major IR theories. The results also indicate that although the nature of climate change is increasingly well understood in the natural and social scientific communities, these insights are not yet adequately integrated into the beliefs of negotiators. This mismatch between scientific and policy-maker knowledge concerns in particular the importance of climate tipping points for beliefs on governance goals and tools, potential costs of climate change, and the timelines for action and expected social and environmental change.

Finally this project expands the methodological toolbox available to IR scholars by demonstrating the potential value and synergistic power of two methodologies. This is one of the first studies to apply cognitive-affective mapping (CAM), a new tool developed by cognitive researchers at the University of Waterloo, in a sustained empirical effort. CAM is very effective in revealing cognitive content and structures of study participants. The tool has clear limits regarding the visualization of large, highly complex, and strongly connected belief systems, but it has been very well suited for the exploratory stage of this research program. Sec-

ond, this project has demonstrated the power of Q Method for the study of inter-subjectively shared belief systems. The method is not new but hardly used in IR and political science.

2. Policy Relevance

Although this work is far from comprehensive, it elucidates some motivations and viewpoints that make the climate change negotiation difficult. Showing that belief systems about climate change and multilateral cooperation are only partly determined by material structures, the cognitive analysis reveals how perceptions of the given material realities interact with different forms of identity, risk assessments, associated emotions, and normative beliefs. These different cognitive realities appear hard to reconcile at first glance, but a closer inspection of the data offers reasons for optimism and helps identify room for compromise. Most importantly, gaining a deeper and more detailed understanding of the different perspectives underlying parties' negotiation positions can increase negotiators' general understanding and respect for each other, building trust that is often claimed to be lacking in the UNFCCC community. This knowledge might also help parties and stakeholders develop negotiation strategies that are able to take some of these concerns into account.

VI. LIMITS OF ANALYSIS

This project has two important limitations. First, I am only interested in the international politics of climate change, not global affairs in general or domestic climate politics in specific countries. Owing to the focus of this research on special problem characteristics of climate change, the theoretical framework I develop has only limited applicability to other global governance challenges or international relations more generally.

The focus on global climate politics further implies that this project investigates the cognitive processes of a particular group—participants in global climate change negotiations—rather than human beings in general, citizens of a particular country or other social groups. This group consists of several sub-groups, including state representatives (diplomats/negotiators), representatives of non-governmental organizations (NGOs), and representatives of corporate actors (firms, business associations). Second, I am not interested in the general political psychology of international climate decision-making, which concerns various cognitive mechanisms that bound rationality. Psychology and behavioral sciences explore these mechanisms extensively, for example prospect theory (Kahneman and Tversky 1979), anchoring, or the availability heuristic (Slovic 2000). Instead I focus on cognitive content—the concepts and conceptual clusters that are specific to climate change (e.g., climate sensitivity, climate security) and their associated cognitive processes (e.g., long-term cost-benefit analysis).

VII. A GUIDE TO THE DISSERTATION

The following chapter, chapter 2, will offer a brief survey of different literatures in IR and the cognitive sciences relevant to this research project. Drawing out key themes from these diverse areas of research, the chapter sets up the foundations and key components of a cognitive analysis. At the center of this literature synthesis is the question how cognition can be defined for the purpose of analyzing international climate politics. Given that cognition as a process has not received a lot of attention in mainstream IR scholarship, the review probes cognitive assumptions of major IR theories and integrates them into a preliminary conceptual framework.

Chapters 3 and 4 present the empirical and analytical results of the interview-based cognitive-affective mapping process. Chapter 3 provides a detailed introduction to the method and participant selection. The main body of the chapter summarizes the key findings of the mapping exercise, describing existing beliefs patterns in six different participant groups. Chapter 4 builds on this empirical foundation to answer the central research question about the role of cognition in global climate politics. My main insights concern the existence and interaction of cognitive elements that confirm both rationalist and constructivist expectations, the presence of cognitive elements in phenomena that fall outside the ambit of these theoretical lenses, cognitive responses to special problem characteristics that appear unsatisfying and call attention to challenges at the science-policy interface in global climate governance, and finally the effects of all of these factors on agency in the climate change negotiations.

I summarize the methods and results of the Q study in Chapter 5. I identify and compare six different belief systems of participants in the UNFCCC negotiations. Again, both rationalist and constructivist processes are present and interact with other cognitive elements to form emotionally coherent networks of meaning. I also highlight a set of beliefs that is shared among all study participants and forms the current minimum consensus and motivation for continuing negotiations. At the same time the Q study identified a number of highly contentious ideas.

The conclusion ties together these findings and emphasizes their relevance for the scholarly and policy-maker communities. Offering thoughts on future directions of this research program I make the case for an ambitious effort to build a cognitive theory of IR that could bridge major strands of existing theory without abandoning their rich insights.

CHAPTER 2

Building A Theoretical Framework for Cognitive Analysis – A Review of Relevant Political and Cognitive Science Literature

This chapter has two aims. First, it offers a summary of the existing literature on issues related to cognition, cooperation and climate change in political and cognitive science and adjacent disciplines. Second, through this literature review the chapter outlines the conceptual approach to answering the central research question of this study:

What cognitive elements and processes promote or inhibit cooperation to achieve effective responses to climate change?

I start with a brief definition of the term cognition for the purpose of this research project (I). Section II reviews major IR theories of cooperation with the goal to identify their implicit cognitive assumptions. Section III reviews recent developments outside IR regarding the relevance of cognition for human responses to climate change. Collectively, sections II and III indicate the limits of current research regarding the first sub-question outlined in Chapter 1 (p. 10)—what are the cognitive elements and processes relevant for decision-making on multilateral cooperation and climate change. In section IV I turn to the second sub-question (pp.10-11) whether climate change displays special problem characteristics that influence efforts to find cooperative solutions at the international level. Based on these findings section V summarizes the necessary elements for a theoretical framework for the cognitive analysis of global climate politics.

I. WHAT IS COGNITION?

Cognition is generally defined as the mental process of knowing and acquiring knowledge, including aspects such as awareness, perception, reasoning, intuition, judgment and decision-making. Many disciplines study cognition, but the usage and definition of the term differ between them. Cognitive science takes an information-processing view of mental processes (see section I.1.). Within political science and IR cognition is the subject of two different research programs. One concerns the identification of beliefs and belief structures of individual decision makers (see section II.). The other is the field of political psychology that draws heavily on cognitive psychology to understand general mental processes that shape political decision-making, often countering the assumption of rational choice theory that human beings are purely expected utility maximizers. According to Stein and Welch “Cognitive psychology explains deviations from rational actor assumptions about judgment, estimation and choice by looking at the simple rules people use to make timely responses to complex and ill structured problems.” (Gross Stein and Welch 1997, 53). Defining cognition somewhat more narrowly than the cognitive sciences, political psychologists study the simple decision-rules or ‘short cuts’ of the brain when dealing with complex decision processes. These simple rules refer to issues like heuristics (Finucane et al. 2000), prospect theory (Kahneman and Tversky 1979; Berejekian 1997; Fanis 2004; Mercer 2005b), schemata and cognitive biases.

This study is not interested in general cognitive mechanisms that impair or distort rational decision-making. Rather I seek to understand the issue-specific substance and structure of decision-makers’ belief-systems, in other words the concepts and emotions that structure a person’s point of view regardless of the operation of heuristics or biases. Therefore my definition of cognition is closely aligned with the information processing approach of the cognitive sci-

ences. It is distinct from but does not oppose the political psychology approach. I define cognition as the elements, structures and processes of individual and collective thought and feeling. Consequently cognitive analysis is concerned with ‘what is going on in a person’s head’ and the inter-subjectively shared ideas, meaning systems and emotions in a group. Since integrating thought and emotion rather than treating them as separate or interacting systems is still controversial in the cognitive sciences I address this debate in more detail below (section I.3.).

1. Theories of Mental Representation

In the cognitive sciences there are two major approaches to (individual) cognition. Both were inspired by the emergence of computer sciences and artificial intelligence in the 1950s, and countered the previously dominant behaviorism (Thagard 2005, 6). Both theories agree on the main entities of cognition—elements, structures, and processes—but they differ regarding the nature of the relationship between them. Some cognitive scientists conceptualize cognition as *verbal processing* based on the application IF-THEN rules to a certain problem (Thagard 2005, chap. 3). Only one rule operates at a time, and series of rules result in decisions. This early approach is associated with the theory of propositional attitudes, which conceptualizes individual knowledge as a list of statements (propositions).

On the other end of the spectrum is the *neural network* approach (connectionism), which perceives of cognition as processes of a complex network, in which individual cognitive elements are nodes that can be activated by links between them. Knowledge is coded in the neural network structures by simultaneous activation of several nodes. Consequently learning and cognitive change requires a structural reconfiguration of the network (Antal and Hukkinen 2010, 938). In neural networks parallel processing is possible, and information spreads in

non-linear ways (Thagard 2005, chap. 7). The central process for making decisions or solving problems in a neural network is (emotional) coherence (Thagard 2000). Recently these two approaches—verbal processing and connectionism—have been converging, suggesting that the mind uses both rule-based and connectionist operations (Eliasmith and Anderson 2004).

2. Cognitive Entities

The basic ontological entities of cognition are mental representations, structures and processes. There are several basic kinds of *mental representations*, including concepts (Thagard 2005, chap. 4), beliefs (including causal beliefs), goals or motivations (Thagard 2010b, chap. 6), images and representations of events. Concepts usually correspond to single words or terms that stand for something in the world, for example, chair, parents or climate change. Concepts are relational in the sense that they are linked to entities in the material world and to numerous other concepts, and only make sense in the context of those relationships. Beliefs are propositions or convictions—they are statements about the world, such as ‘climate change is a hoax’ or ‘fast food is bad for your health’. The most important type of beliefs is causal beliefs. They are the foundation of goal-oriented human behavior. In order to achieve a certain goal, one needs to be able to identify the actions or processes that can lead to the desired outcome. Goals are desirable states of the world that orient and drive human behavior.

Structures are the linkages and relationships between mental representations. Based on a connectionist ontology, these structures are best conceptualized as networks in which the nodes are individual mental representations with various connections (links) between them. Clusters or sets of concepts form beliefs, images, or other cognitive structures. Each of these

structural elements is part of a larger cognitive network and becomes activated in particular contexts.

Process – Cognitive processes include making decisions, solving algebra problems, and assessing risks. A particularly interesting set of processes concerns the acquisition, change and abandonment of mental representations, including the adding of concepts (new knowledge), the changing of beliefs or world views (changing existing structures), and replacing or ‘deleting’ existing mental representations.

While these elements answer the question “What is there?” they do not yet account for the semantic content of cognition (“Where does meaning come from?”). Meaning emerges from the connections between multiple cognitive elements, structures and processes as much as from their relationship to entities in the material and social worlds (Markus and Hamedani 2007). For example, my mental representation of climate change consists of a large number of concepts (e.g., the greenhouse effect, temperature change, Arctic summer sea ice melt, food scarcity, tipping points, international negotiations or solar power), images related to individual concepts or clusters of concepts (e.g., glacier retreat in a time series of photographs or islands submerging under rising sea levels) and goals (e.g., preparing for security implications of climate change). Each element is linked to many others and each relates to physical realities and events (e.g., the experience of a heat wave in Ontario, or news reports about a drought in the Southern USA in July 2011), information regarding scientific findings in academic journals, or conversations with my colleagues about climate change governance. When making a decision (e.g., what kind of course I am going to teach next term), all these elements and their linkages play a role.

3. Cognition and Emotion

Cognition and emotion are inextricably linked—feeling is integral to knowing. Building on advances in the cognitive sciences over the last two decades (Damasio 1995; G. F. Loewenstein et al. 2001; Vohs, Baumeister, and Loewenstein 2007; Duncan and Barrett 2007; Scholl 2013), Thagard argues that previous views of cognition as computational processes of deliberative coherence are incomplete and puts forward a theory of cognition as a process of *emotional coherence* (Thagard 2006, chap. 2; Thagard 2008). He suggests that emotions are mental states, which cannot be separated from the cognitive elements described above: concepts can have emotional valences (e.g., positive emotions related to the idea of a long vacation, or negative emotions related to the concept of death), as can beliefs (e.g., ‘climate change is real’ can evoke fear and guilt) and goals (thinking about getting your driver’s license makes you happy). Emotions are also involved in cognitive processes, such as rejecting or revising beliefs. Accepting a new belief based on coherence feels good; if a new belief is incoherent with one’s existing beliefs, it is irritating. Thagard further assumes that decisions are based on a process of multiple constraint satisfaction, taking into consideration both the cognitive acceptability of a mental representation and its emotional valence. Based on this view, emotions are intrinsically linked to all cognitive elements, structures and processes, and any cognitive theory has to account for the emotional content of cognition.

Psychologists and communication scientists broadly support this integrated cognitive-affective perspective (Moser in Moser and Dilling 2007, chap. 3; Finucane et al Slovic 2000, chap. 26). Political scientists Crawford (Crawford 2000), McDermott (McDermott 2004) and Mercer have made first attempts to introduce the idea of affective rationality into the field of IR. Mercer argues that emotional cognition is an “assimilation mechanism” for new informa-

tion into existing belief structures and plays a major role in risk assessments (Mercer 2005a; Mercer 2010).

However, this integrative view of cognition as inseparable processes of thought and feeling is still contested in many disciplines, including the cognitive sciences. The prevalent view defines cognition and emotion as separate but interacting systems, each with functionally specialized areas in the brain. While this perspective has already evolved from Zajonc's argument that emotion is primary and independent of cognition (Zajonc 1980) or Lazarus' position that emotion is secondary and dependent on cognition (Lazarus 1982), recent work increasingly emphasizes that "there are no truly separate systems for emotion and cognition because complex emotional-cognitive behavior emerges from the rich, dynamic interactions between the brain networks. ... the neural basis of cognition and emotion should be viewed as strongly non-modular." (Pessoa 2008, 148).

4. Linking Individual and Collective Cognition

Cognition takes place in the brain of an individual, but all social behavior depends on the ability of social groups to attribute shared meaning to objects, behaviors, and words (language). Collective-meaning making is a fundamental process for human societies, and it is at the heart of political decision-making. But can we actually attribute beliefs to social groups—is there such a thing as collective cognition? If not—because groups do not have brains—how can we conceptualize the processes and results of collective sense-making? Below I briefly outline the challenges of distinguishing between individual and collective processes of thought and meaning-making, identifying the interactions between the individual and social

processes involved in collective cognition. However, these issues ultimately deserve more space and theoretical attention than I can offer here.

There are at least three approaches to the question how to link individual and collective cognition: working with averages (Antal and Hukkinen 2010), making assumptions about the beliefs shared by the majority (aggregation), or relying on the belief structures of key individuals (representatives, leaders) of a group.

Thagard argues that cognition is a process that consists of interacting mechanisms at the neural, molecular, psychological, and social levels (Thagard 2010c). Using this *multilevelism* approach, “social systems are best understood by depicting their operations at all relevant levels” (Thagard 2010c, 273). Given that groups do not have brains, and collective mental representations are therefore not real entities, he suggests that person-group problem can also be conceptualized in terms of multilevel interacting mechanisms: the interaction between individual-level mechanisms (i.e., molecular, neural and psychological processes) and group-level mechanisms (i.e., communication and sensory interaction) create the bonds that hold a group together. The key to collective cognition is the individual who thinks about himself as a member of the group (Thagard 2010c, 274). Writing about conflict Ellemers supports this view by exploring the conditions under which “the group self”—thinking about oneself as a member of a group—becomes more important than the individual self (Ellemers 2012). Further, Thagard’s multilevelism and Hacking’s theory of the looping effect of human kinds (Hacking 2001) capture the same phenomena. Hacking suggests that the creation of new categories for social groups changes the way (members of) these groups behave and interact with other groups. In Thagard’s terms the creation of new group categories involves new ways of thinking about oneself as a group member (in comparison to other groups). These mental rep-

representations include identity-related concepts about the self, concepts about other group members and concepts about the group as an entity in itself. Individuals acquire and change group-related beliefs through interactions with other people and with other aspects of group-related experiences, including the use of collective resources and property, for instance certain spaces and office buildings, or the collective experience of events. This process of social communication and physical-sensory interaction synchronizes the mental representations related to the group in the minds of group members and non-members. The process works both ways: an individual not only receives information about the group and develops an understanding of the group as a collective entity, she also contributes to other people's mental representations and experiences of the group. The nature of the group depends on this recursive process between individual cognition and social interaction between group members.

Understanding collective beliefs therefore requires first of all an understanding of how individuals "envision" themselves as group members and the emotions, values and meanings they attach to this membership (Thagard 2010b, 274; see also Tajfel, Introduction in Tajfel 1982, 2–3). Second, in order to create shared understandings in a group, communication and physical interactions with each other and the group's social-material environment are important processes, allowing individuals to share ideas and emotions, and enabling individual and collective cognitive change (e.g., acquiring or revising shared beliefs). At the same time, the social communication processes that lead to shared beliefs operate in both directions. Much of an individual's belief system has been received from the outside, severely limiting the ways he can envision himself as a group member. Political processes and structures are also relevant social dynamics, for example, legislative deliberation and decision-making procedures, bureaucratic hierarchies, or the composition of committees.

To summarize, the link between individual and collective cognition manifests itself in each individual's cognitive structure and processes, which contain concepts and emotional valences related to the group and to the individual's membership in the group (social identity). These mental representations are shaped by the information received when interacting with the group. That in turn is shared with the group and can impact how other group members perceive of themselves and the group.

This conception of the link between the individual and the group as mutual constitution is reminiscent of Giddens's structuration theory, which suggests that there is a mutual relationship between social structures and agents (Giddens 1992). While structures constrain and enable meaningful behavior, agents can use existing structures to create social change and to change their conceptions of themselves and their group. The structural conditions at any point in time serve as a stable reality against which ideas for alternative, desirable conditions can be presented. These ideas can destabilize existing institutions and norms, but only because these structures have been perceived as stable before.

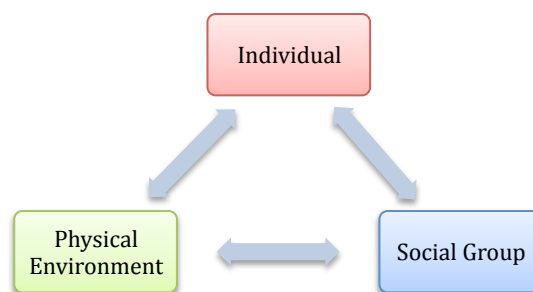
5. Linking Cognition and Social-Material Realities

Cognitive processes are not only influenced by interactions with other people, but also by interactions with the material world of objects—natural and artificial entities, including plants, ecosystems, buildings or books—and events, including storms or species extinctions. When talking about climate change, objects and events in the natural environment are of particular interest: how do we categorize natural kinds (e.g., climatic zones), (how) can change be observed (e.g., the melting of the Arctic summer sea ice), and how do we make sense of extreme weather events?

A special problem in this context is the role of scientific information. Science seeks to explain the entities that exist, the causes of change in the natural world, the likelihood of future change and the explanation of unobservable entities or developments. Does abstract information in scientific journals have the same cognitive influence like the personal experience of flooding? And to what extent is scientific information simply a reflection of the physical, chemical or biological reality, or a social construct? Does it matter that categories like average global temperature and climate sensitivity are artificial kinds with strong relations to natural kinds, but depend on human cognition?

A full theory of cognition will have to take all three processes outlined above into consideration: the relational process of sense-making or meaning creation; the interaction between individual cognition and social groups and with the physical environment. This includes mechanisms of communication, physical interaction, observation with the human senses and interpretation, all of which contribute to the creation of inter-subjective agreement on the meaning of objects, events, and social facts.

Figure 2-1: Relational Cognition



6. Rational Choice

Cognition goes beyond, but includes, the current definition of rational choice. Rational decision-making is a cognitive process that includes risk and value assessments and cost-

benefit calculations, which in turn require the existence of cognitive elements such as concepts about values, costs, benefits and beliefs about causality. This research project will explore to what extent rational choice plays a role in decision-making regarding climate change, and to what extent it may be affected by emotions or complemented by other cognitive processes.

II. COGNITION IN IR THEORY

A cognitive theory of IR is not a competitor to the existing “big three”—neorealism, neo-liberal institutionalism, and social constructivism—because it works at a different level of explanation. The existing theories relate human behavior in international affairs, for example, engaging in military conflict, either to observable variables with material, measurable manifestations, such as power structures and imbalances, or to ideas and norms, such as humanitarian intervention. Using the rationality assumption, analysts believe they can understand the relevance of these material circumstances or ideas for the decisions and behavior of actors in the international system.

Rather than assuming that the rational analyst can replicate the rational decisions of a policy-maker, cognitive analysis seeks to describe the actual cognitive processes underlying the observed decisions and behavior. Cognitive analysis reveals whether and to what extent a specific decision was based on a rational cost-benefit analysis as assumed by realists, or on assessments of morally appropriate behavior and the relationship between identity and norms as suggested by constructivists. Did US President George W. Bush calculate the economic cost of a carbon tax when refusing to ratify the Kyoto Protocol? Do European policy-makers push ahead with cap-and-trade because they see themselves as climate and technology cham-

pions, and simply disregard calculated economic costs? Or do these two actors simply have different definitions of economic costs in the context of climate change? Providing answers to these questions, cognitive analysis can verify the cognitive assumptions of major IR theories and maybe point to theoretical lacunae if those assumptions do not fully capture the thought processes revealed.

A cognitive approach focuses on mental processes that provide the link between material and social factors (i.e., the material system structure or the normative-ideational structure) and the decisions and behaviors of individuals and group. Therefore cognitive processes as a variable are best understood as a set of causally intermediate processes exhibiting reciprocal relations with structural-material factors and social behavior.

1. Cognitive Assumptions of Major IR Theories

As suggested above, most IR theories rely on important implicit assumptions about thought processes of decision-makers that lead to observed behavior, but do not consider these thought processes as causal. Theorists of all denominations work with the assumption that individuals and groups have similar or stable cognitive patterns across different situations. The theories might differ regarding the cognitive elements and processes they consider to be important drivers for human behavior, but all take the existence of cognitive processes for granted.

This section explores these basic cognitive assumptions of major IR theories. It is not unreasonable to expect that each theory simply captures one particular type of cognitive process, and that all of these types can co-exist.

I briefly review three sets of literature: major theories on international cooperation, theories on conflict (i.e., the failure to cooperate), and a set of theories on political mobilization and revolution, which are forms of cooperative political behavior at different social scales.

a. Theories of Cooperation

Much of IR scholarship is concerned with the question why and under what conditions states cooperate. The standard answer has become “When it is in their interest.” How actors define this national interest has been the subject of an ongoing debate for decades. However, all theories agree that state cooperation usually takes the form of (international) regimes (Krasner 1983), such as the UNFCCC and the Kyoto Protocol. Climate change belongs in the category of collective action problems that Hardin described as prone to the “tragedy of the commons”—the rational overexploitation of the atmosphere by individuals (i.e., states) results in the undersupply of a global public good (climate stability), or worse, in the collapse of the shared resource (Hardin 1968). Conventional collective-action theory predicts that cooperative solutions cannot be found unless an external authority or a hegemon establishes a rule-based system and penalizes rule-infringement (Ostrom 2010).

The two dominant strands of thinking in IR—*neorealism and neoliberal institutionalism*—share the basic cognitive assumption that human beings are rational decision-makers, who perform mental cost-benefit calculations when considering their response to a certain situation. Because actors’ choices are supposedly driven by the goal of utility or gain maximization (based on whatever the relevant actor considers to be a gain), Ruggie labels these two major theories neo-utilitarianism (Ruggie 1998). Since the 1970s the rational-choice explanations for international cooperation have slowly shifted from a neo-realist focus on coercion

(hegemonic stability theory) to neo-liberal institutionalist focus on shared gains and learning, including cooperation against the hegemon. The strategic nature of this approach has led to a wide application of game theory, and the attempt to analyze international affairs through the lens of highly simplified game analogies of real-world situations.

According to hegemonic stability theory the existence of a hegemon is necessary and sufficient for international regime formation in an anarchical international system, because the hegemon has a rational interest and the coercive capacity to both exploit and institutionalize its temporary structural dominance in order to maximize benefits from cooperation. Cooperative benefits for other states or the supply global public goods are welcome side effects. The most successful attack on hegemonic stability theory came from an unexpected corner—global environmental governance. Falkner argues that many international environmental agreements have been created without the contribution or even against the will of the existing hegemon (Falkner 2006). In these cases the rational calculations of the cooperators supposedly suggest that the benefits of an environmental regime would outweigh its costs regardless of the participation of the hegemon.

Other scholars have applied utilitarian thinking to cases of cooperation without the state (Ostrom 1990) and the question whether different types of collective action problems require different forms of cooperation (Barrett 2007).

Neo-Gramscian theory provides a more holistic, critical system perspective, according to which sets of ideas matter for the stability and functioning of a society by providing the ideational glue that holds the various elements together in a stable structure. A “hegemonic ideology” provides the justification or rationale for the given set of social structures and power relations. Taking a neo-Gramscian view, some authors argue that business actors in today’s

global economy defend the hegemonic neo-liberal-capitalist ideology and actively seek to prevent its destabilization by competing climate change-driven narratives (Levy and Newell 2004, chap. 4).

Social constructivism assumes a very different cognitive reality, suggesting that the most relevant cognitive entities are concepts related to actor identity, norms, and assessments of (in)justice in any given context. According to constructivists it is not the objective system structure that matters for state decision-making, but how different actors interpret this structural environment and what ideas they apply to it—the existing ideational structure (Wendt 1992). Rather than giving ontological primacy to material or ideational reality, constructivists seek to understand how material realities gain meaning through social interaction. Such ideational flexibility emphasizes the differences in actors’ identities and cultures—their perceptions of themselves and others—and the generally accepted norms of behavior. Going even further than allowing ideas to have causal power in international affairs, constructivists argue that ideas can have constitutive power—they can bring entities into existence (for the construction of social kinds, Wendt 1999, 77 ff., 171 ff.; for the social construction power of international organizations, Barnett and Finnemore 2004; for the causal power of norms, Thomas 2001).

However, with few exceptions (Albin 2001; Roberts and Parks 2006) constructivist theories do not provide general insights regarding the types or components of identities and norms that are needed to produce cooperation on climate change, or those that prevent cooperative agreements. Constructivism is issue-specific, relying on process-tracing and discourse analysis to uncover the causal role of ideas in a particular situation. Cognitive analysis differs from

constructivism in attributing causality not to ideas, but to motivated individuals and social groups, who have cognitive responses to the environment they interact with.

Foreign policy analysis has developed its own strand of research on the role of ideas and identities in international politics. The influence of identity in foreign policy became one of the major themes in this field in the early 2000s (Kaarbo 2003). Goldstein (Goldstein 1988) and Katzenstein (Katzenstein 1996) are two important examples of attempts to address the question of norms and identities as cognitive bases for policy-making. But most of this research does not focus on cognitive or psychological processes, but rather “on the impact of particular beliefs, shared by large numbers of people, about the nature of their worlds that have implications for human action” (Goldstein and Keohane 1993, 7). Kaarbo therefore argues that integrating research on the beliefs of individual leaders about their environment, and how individual information processing can affect foreign policy choices, would be a valuable research avenue to pursue (Kaarbo 2003).

b. Theories of Conflict

If one understands conflict as the failure to cooperate, then one can reasonably expect the same cognitive processes to be involved in the decision-making processes of conflict parties.

Structural theories and the rationality paradigm dominate the conflict literature as much as theories of cooperation (Waltz 1979; Nicholson 1992). A number of scholars have explored constraints on rationality to explain conflict-related decisions that deviate from the expectations of rational choice theory (Jervis 1976; Stein and Welch in Geva and Mintz 1997, chap. 4), but few have suggested that the rationality ideal lacks explanatory utility.

The conflict literature has borrowed heavily and fruitfully from a sociological theory of *social identity* and intergroup conflict (Tajfel 1982). Tajfel’s insights regarding the human

tendency to develop in-group preferences and out-group competition or even hostility has become the foundation for theories of ethnocentrism (LeVine and Campbell 1972; Hammond and Axelrod 2006), ethnic conflict (1985, chap. 4; Ignatieff 1998, 34–71) and racism (Kurzban, Tooby, and Cosmides 2001). Exaggerating intergroup differences as a tool for identity formation and confirmation is associated with the generation and use of stereotypes. Brown describes stereotyping as a natural cognitive process of social categorization, which by itself it does not cause hostilities, but can influence how we behave towards individuals of other groups (e.g., discrimination) (R. Brown 1986, chap. 16). Brown further argues that the outbreak of ethnic conflict requires the identification of (comparable) in- and out-groups combined with perception of *injustice*, in other words, the individual assessment of the unfairness of the in-group's disadvantage in comparison with the out-group becomes the central motivation for conflict. An aggressive group blames an out-group for the current injustice, and considers (violent) conflict as the best strategy to remedy this situation (R. Brown 1986, chap. 15, 17).

Recent scholarship that increasingly focuses on cognition as a factor in violent and non-violent conflict also investigates group identity beliefs as sources of conflict, for example, sacred values and religion (Atran and Ginges 2012), cultural diversity and prejudice (Crisp and Meleady 2012), and the need for an “overarching” or inclusive social identity for stable “peace systems” (Fry 2012). All of these examples are part of a larger trend towards exploring the biological and evolutionary causes of conflict by studying beliefs or cognitive processes as drivers of behavior. This includes a research program on the biology of cultural conflict, which starts from the assumption that brain processes are the foundation of any kind of

thought and belief, and therefore the roots of conflict lie in the differences between the brain processes of members of different cultural groups (Berns and Atran 2012).

Related theories of conflict focus on the role of perceived *injustice* as a cause of conflict. The most important is relative deprivation theory (Berkowitz in Davies 1971; Davies in Davies 1971), which suggests that increasing deprivation on its own is not sufficient to cause violent conflict. Rather, the necessary conditions for a revolution include a shift of a group's perceptions of its current situation from "the way things are" to being unjust. Such a shift can occur when a phase of improving conditions (e.g., economic growth) creates hopes and rising expectations of social progress, but is followed by a sharp decline that frustrates these expectations. In these circumstances a previously tolerated level of deprivation becomes unacceptable. Other circumstances causing such a shift in perceptions can include social-economic status comparisons to other groups or the identification of circumstances that advantage other groups over the revolutionary group. More generally, Welch has developed a theory about the role of justice in "the genesis of war" and its importance as a motive for the behavior of states (Welch 1995).

c. Political Mobilization

Sociology offers important insights regarding political mobilization in social movements. Political scientists have utilized these insights to study the causes and dynamics of revolution. Since political mobilization requires cooperation in a group of people, this literature presents a third opportunity to identify the cognitive assumptions of theories of political cooperation.

Social movement scholars emphasize the importance of cognitive processes as mediating factors between political opportunity structures and the creation of social movement organizations (McAdam, McCarthy, and Zald 1996)—certain ideas provide the motivation for coordi-

nated action in response to a given socio-political environment. The literature explores the role of cognition in the context of so-called *collective action frames* (CAFs), defined as “action-oriented sets of beliefs and meanings that inspire and legitimate the activities and campaigns of social movement organization” (Benford and Snow 2000). CAFs are the result of “meaning work”—the active and often strategic effort to produce and maintain shared understandings of events and conditions, including convictions regarding what (if anything) should be done about them. The literature treats CAFs as problem or situation-specific, although some suggest the existence of master-frames. CAFs contain at least three elements: diagnosis (problem definition and attribution), prognosis (proposed solutions) and action motivation. Gamson stands out with his suggestion of more distinct elements: *injustice*, *identity* or adversarial elements, and *agency*—a strong parallel to the findings of the cooperation and conflict literatures (Gamson 1992).

d. Theories of Cooperation and the Climate Change Regime

Scholars have used many of the theories mentioned above to analyze the past absence of effective cooperation within the UNFCCC. Since climate change emerged on the global political agenda, rational-choice approaches have been dominant, seeking rational explanations for the failure to supply a global public good (Ward 1996; Grundig 2006; Keohane and Victor 2011). Sunstein concludes that for the US “the monetized benefits of the Kyoto Protocol would be dwarfed by the monetized costs” and consequently the US is rationally opposed to support the climate regime (Sunstein 2007, 5). Based on hegemonic stability theory, Falkner argues that it depends on national interests and domestic factors whether or not the US uses its hegemonic position to exercise leadership or veto power in international environmental agreements. Since domestic support for an effective international climate treaty is lacking, but

the costs for the economic hegemon would be very high, US leadership will not be forthcoming (Falkner 2005). The American negotiation position has confirmed this view, consistently refusing to accept a treaty that does not establish mitigation obligations for the emerging powers and allows them to free ride on the costly efforts of the US. The neorealist pessimism about international cooperation on climate change has led many scholars to advocate for multilevel or polycentric governance (Rayner 1991; Ostrom 2010), shifting attention away from states to sub-state and non-state actors (Pattberg and Stripple 2008; Betsill and Bulkeley 2006; Andonova, Betsill, and Bulkeley 2011). Others have begun to focus on changes in the process and structure of the multilateral negotiation setting (Eckersley 2012) or advocate to simply wait for the emerging powers to accept a greater role (Leal-Arcas 2011).

However, some scholars have doubts about the utility of rational choice models of burden sharing. Bodansky points out that the collective action rationale—everybody is interested in everyone else making binding commitments—does not seem to apply in the case of climate change. The BASIC countries should have a strong interest in binding, numerical emission reduction targets of the developed countries, but they strongly resisted the inclusion of any numbers in an international agreement debated at COP 15 in Copenhagen (Bodansky 2011). At the same time the EU is pushing ahead with costly GHG reductions, knowing that few others are doing the same. If these actors are not making rational decisions, what are the cognitive processes underlying their negotiation positions? Hochstetler and Viola also point to this puzzling behavior with a special focus on Brazil (Hochstetler and Viola 2012). They argue that the global commons logic does not apply to very large emitters since their action can directly affect governance outcomes without cooperative efforts among multiple actors. Domes-

tic factors explain their willingness to take domestic action without international commitments that also bind other states.

Constructivist approaches tend to focus on various processes of social meaning-making in the context of climate change governance (Miller and Edwards 2001; Miller 2001; Pettenger 2007; Liverman 2009) rather than explanations of (non)cooperative negotiation outcomes. Among the exceptions are Roberts and Parks, who offer a detailed account of the role of opposing perceptions of climate justice as barriers to a multilateral agreement, and Eckersley (Eckersley in Reus-Smit 2004, chap. 4), who provides constructivist arguments for the failure of international climate treaty-making (e.g., differences in EU and US regulatory ideals, moral norms and identities). More generally, the literature on climate ethics offers multiple accounts of the importance of norms that should guide the distribution of responsibilities in the climate change regime (Ringius, Torvanger, and Underdal 2002; Caney 2005; Okereke and Dooley 2010; Gardiner 2010; Pickering, Vanderheiden, and Miller 2012). Analyzing domestic trends that oppose climate policies in the US, Jamison connects climate change and social movement theory, suggesting that climate skepticism is a conservative counter-movement to the environmental movement of the 1970s (Jamison 2010). Similar views are expressed by Jacques et al., in an analysis of the role of conservative think tanks in the climate skeptic debate (Jacques, Dunlap, and Freeman 2008).

Taken together, these findings leave a rather bleak and inconclusive picture of the state of international climate politics (Leal-Arcas 2011). Rationalist approaches conclude that past failures to create an effective climate regime are unlikely to be overcome, while ideational approaches similarly point to obstacles to cooperation, such as climate skepticism, perceptions of global injustice and diverging climate discourses.

2. Existing Approaches to Cognition and IR

IR scholarship has developed four distinct theoretical approaches to cognition: (a) the operational code, (b) concept maps, (c) discourse analysis, and (d) image theory.

The earliest cognitive theory in IR is the *Operational Code*, which was developed by Robert Merton (1940), “made more prominent by Leite’s (1953) study of Bolshevism” (M. D. Young and Schafer 1998, 69), and reformulated with more conceptual rigor by Alexander George (George 1969). George developed ten questions that captured political leaders’ beliefs about the principles of political life and argued that a person’s responses form a belief system, in which individual beliefs are “bound together by some form of constraint or functional interdependence” (Cited by M. D. Young and Schafer 1998, 70). Operational codes are issue-specific and subject to change over time (Renshon 2008).

After Axelrod published “The Structure of Decision” in 1976, the idea of *cognitive or conceptual maps* became prominent, and researchers developed sophisticated approaches to mapping the beliefs of individual policy-makers and decision-making bodies (e.g., committees). While most work was based on text analysis, some studies used simulations with policy-makers to gather data and verify their models (Bonham 1988). The core strength of these early maps is the reflection of causal beliefs, assumed to be the basis of decision-making (Astorino-Courtois 1995). Bonham seeks to connect cognitive mapping and international negotiations, arguing that the tool can reveal the assumptions of negotiators, map the effect of individual proposals, and identify common ground (Bonham 1993).

Shapiro et al. proposed an alternative approach to cognition, arguing that *discursive practices* are historically determined constraints for individual cognitive processes (Shapiro, Bonham, and Heradstveit 1988). A discursive practice (frame) is conceived as external to the

individual mind and treated as the agent in the causal model. More generally, *discourse analysis* has become a prominent constructivist approach to the study of global environmental politics (Hajer 1996). A discourse is “a specific ensemble of ideas, concepts and categorizations that are produced, reproduced and transformed in a particular set of practices and through which meaning is given to physical and social realities” (Hajer 1996, 44). Discourse analysis seeks to understand the dynamics that lead to the dominance of one discourse over others or to change of social institutions, for example, the strategic use of story-lines or the formation of discourse coalitions (Maguire and Hardy 2009; Maguire 2004). There are strong parallels between discourses and discursive practices in the study of IR, and collective action frames and frame-related activities in the social movement literature. The major weakness of the discursive approach is its inability to explain the origins of discursive practices and the lack of generalizeability across cases. Further, it seems awkward to attribute causal power to an abstract entity that seems to be suspended in mid-air between individuals, intangible and separate from individual minds.

Another body of research studies *images* as relatively stable mental structures that influence decision-making (Cottam 1986; Herrmann et al. 1997). This work is based on the notion of schemata as organized clusters of concepts. Herrmann connects image theory to gestalt theory, arguing that an image forms an integrated whole rather than a collection of separate and independent parts. The IR-relevant work only deals with images of other countries in the minds of individual decision-makers based on three sources: goal (in)compatibility, power differences (i.e., the potential for agency) and cultural status (identity). Alexander et al. (2005) link image theory to social identity and social dominance, based on ideas very similar to the grid-group typology based on Douglas’ cultural theory (Douglas and Wildavsky 1982).

So far none of these theoretical advances has taken the role of emotion into consideration. Mercer and a number of political psychologists have argued for the integration of emotional factors into political analysis, but so far a coherent theory has remains elusive (Mercer 2005a; Mercer 2010).

3. Summary: Building Blocks for a Theoretical Cognitive Framework 1

These distinct bodies of literature on cooperation, conflict and political mobilization all suggest that there are three sets of basic cognitive entities that are relevant for decision-making on international cooperation:

- a. Mental representations concerning **structural opportunities for and constraints of agency**, often identified through cost-benefit calculations regarding different action options in a given situation,
- b. Mental representations related to different **actor identities** (in- and out-groups),
- c. Mental representations related to notions of **justice**.

Past insights regarding cognitive structures suggests that different elements tend to be grouped together in a coherent manner to form images, (collective action) frames or discourses. These structures provide the foundation for individual and collective decision-making, for instance, as an operational code or as prescriptive elements of a collective action frame. However, it remains unclear to what extent one can make general statements about these cognitive structures across issues and cases. A theory about the process of decision-making using these structures is lacking entirely. Concept maps, based on causal beliefs, so far provide the most detailed insights into the thought-processes of decision-makers.

Building on these insights I approach the research project with the assumption that each of the major theories mentioned above has equal validity—it is possible that all of the cognitive assumptions they make are relevant for political decisions regarding cooperation on climate change, and that they may even take place simultaneously (parallel processing). Depending on the context and the decision-maker, some elements might be more important than others. These assumptions raise the question how these distinct processes and consequently theories could be reconciled. Is there a mechanism that facilitates decision-making based on both rational choice, identity and normative considerations simultaneously?

III. COGNITIVE SCIENCE AND CLIMATE CHANGE

This section ventures outside the field of IR to scan the growing cognitive science literature including social psychology, communication and decision sciences, for relevant insights regarding the cognitive processes influencing global climate politics. Three distinct bodies of literature in various sub-disciplines of the cognitive sciences seek to explain how people respond to climate change information, in particular to what extent they are willing to support costly collective action (e.g., supporting GHG emission policies, reducing their personal energy consumption patterns). Many studies are motivated by the puzzle that popular concern about climate change has been wavering while scientific consensus on the reasons for concern has been solidifying over the last two decades. Finally I briefly review the literature on mental models.

1. Explaining Public Complacency

Beyond the quantitative analysis of public concern about climate change (Leiserowitz 2006; N. Smith and Leiserowitz 2012; Kvaløy, Finseraas, and Listhaug 2012) numerous research programs explore the various *cognitive-affective coping mechanisms* people use to protect themselves from difficult or threatening information, such as climate change science. Norgaard argues that accurate and complete understanding of the science is not a prerequisite for concern. However, many people stop paying attention to the issue when they realize there is no easily available solution; concern is maintained only if action options are available and known. Norgaard lays out a theory of *socially organized denial*, arguing that people work to avoid disturbing information in order to (i) avoid negative emotions, such as fear, guilt, helplessness, (ii) follow cultural norms, such as not raising difficult subjects in conversation that could humiliate interlocutors, or (iii) maintain positive conceptions of individual and national identity. Societies develop a repertoire of techniques to ignore disturbing problems and create a narrative in which “everything is fine.” They do not want to know (Norgaard 2011; Norgaard in Dryzek, Norgaard, and Schlosberg 2011, chap. 27).

Similar views are expressed by other authors, who point to contradictions between climate change information and the human need to believe in a just and stable world (M. Feinberg and Willer 2010), or to various beliefs that might be cognitive preconditions for supporting climate action, including beliefs about one’s ability to remedy the problem (Krosnick et al. 2006; Lorenzoni and Pidgeon 2006).

The central argument of a set of theories around *cultural cognition* (Kahan, Jenkins-Smith, and Braman 2011) and *ideology* is that people make decisions in line with pre-existing cognitive structures and deeply held cultural values. They point out that climate

change information does not have a “blank slate” to start from, but encounters cognitive structures and meaning systems that have developed over a long period of time and are difficult to change. Depending on the fit between the new information and the existing belief structures, the individual is more or less likely to reject the information rather than to adjust the given belief and value system to integrate climate change (confirmation bias). The same argument is made for risk perceptions and the social amplification/attenuation of risk (Dessai et al. 2004; Weber 2010; Leiserowitz in Moser and Dilling 2007). Swim et al. provide an overview of the psychological literature on dealing with climate change (Swim et al. 2011).

Both of these literatures converge in a body of research exploring the link between *climate skepticism* and political conservatism (Jacques 2012), especially in the United States. This work suggests that climate skepticism is dominant among conservatives, because the implications of climate change are threatening to deeply held conservative values, such as individualism, private property and free enterprise, small government, and anti-multilateralism (McCright and Dunlap 2000; Jamison 2010). Conservative cognitive structures resist the change required to integrate climate change policies. The cognitive dissonance is resolved with climate skepticism, which becomes a cognitive-affective coping mechanism, or even a political tactic (Jacques, Dunlap, and Freeman 2008) to protect a coherent conservative ideology. Connected research explores the role of (biased) media reporting on climate change and its relevance for the public communication process in a democracy (Carvalho 2007; Antilla 2005). More generally, there is a growing field of research integrating morality, environmental attitudes, ideology and politics (M. Feinberg and Willer 2010; Hatemi and McDermott 2012; Matthew Feinberg and Willer 2013).

Based on these insights communication research seeks to develop strategies for improving public climate change communication (Pidgeon 2012) and for increasing political mobilization for climate action through framing (Bain et al. 2012), careful selection of the messenger and message content, for instance, a focus on solutions rather than dire warnings of a gloomy future (Stern 2012). Johnson critically compares three communication strategies discussed in the literature, including persuasion, political movement mobilization, and deliberation (Johnson 2012). A recent focus on the role of emotions strengthens the link between communication and risk research and cognitive science (Meijnders, Midden, and Wilke 2001; Weber 2006; Myers et al. 2012; Roeser 2012).

All of these research streams are concerned with the responses of individual voters, public opinion or social-political movements. Lowe and Lorenzoni's work on expert views is an exception (Lowe and Lorenzoni 2007). So far there have been no studies connecting these insights to the cognitive processes of diplomats, policy-makers, representatives of climate NGOs or business actors engaged in the international negotiation process. Given the professional-cultural context of individuals engaged in the negotiations, one can expect that for this particular group cognitive-affective coping mechanisms are less important than the constraints of cultural cognition and ideology. A diplomat assigned to the climate desk is unlikely to respond to this task with climate change denial. It is more likely that the Habermasian "life-world" of negotiation participants (Depledge 2006, 10) reifies certain ideas regarding the purpose and justification of UNFCCC negotiations. Further, the minds of negotiators might contain some cognitive elements and processes that do not feature in the thought processes of private individuals, such as concepts related to the national interest, the role of the state, and power in a multilateral context.

2. Mental Models

The concept of mental models originates in psychology (Craik 1943) and has become increasingly popular in multiple disciplines since the growth of cognitive science in the 1990s. “Mental models are personal, internal representations of external reality that people use to interact with the world around them ... used to reason and make decisions and can be the basis for individual behaviors.” (Denzau and North 1994, 4–5; Jones et al. 2011, 45). Mental models are cognitive structures that contain assumptions about how the world works; they affect how people filter, process and store information, in other words what knowledge an actor derives from its interactions with other people and the physical environment (Kolkman, Kok, and van der Veen 2005, 320). They “guide understanding, reasoning, prediction and ultimately action” (Biggs et al. 2011, 170).

Mental models can be shared inter-subjectively. Through communication and culture people can develop similar models, which become the source for group ideologies or societal institutions. Mental models are essential to the way societies structure their environment and interact with it (Denzau and North 1994).

A number of scholars have argued that a mental model approach could be very valuable in multi-stakeholder policy processes, especially in natural resources management (Kolkman, Kok, and van der Veen 2005; Jones et al. 2011; Mathevet et al. 2011; Du Toit, Biggs, and Pollard 2011) and conservation planning (Biggs et al. 2011). Lowe and Lorenzoni have applied the approach to elicit expert views on the concept of danger as it relates to climate change (Lowe and Lorenzoni 2007). They identified three distinct mental models of danger: (i) human influence on the climate system, (ii) climate-related impacts on natural and human communities, and (iii) threat to status quo. Although I am not using a mental model terminol-

ogy, the cognitive analysis conducted for this research project with the aim to uncover existing belief systems among participants in the global climate negotiations is an exercise in identifying mental models broadly defined.

3. Summary: Building Blocks for a Cognitive Theoretical Framework 2

This review of some general and some climate change-specific literature in the cognitive sciences has pointed to a number of cognitive entities that should be part of a cognitive framework for the analysis of climate politics:

- a. Emotions** as important factors in risk perceptions and moral judgment,
- b.** The distinction and link between **individual and collective cognition**,
- c.** The link between **cognition and material-social realities** (relationalism),
- d. Decision-making mechanisms** (e.g., emotional coherence, constrained by existing cognitive structures).

IV. CLIMATE CHANGE—A COGNITIVE CHALLENGE *SUI GENERIS*?

Is it possible that climate change displays special characteristics that influence the cognitive and consequently political response to it? Some authors have suggested that climate change is a ‘wicked’ (Rittel and Webber 1973; Prins et al. 2010) or even ‘super-wicked’ problem (Levin et al. 2009; Levin et al. 2012). This line of argument goes beyond the notion that the institutional design of international treaties should respond to the specific problem structure (Mitchell 2006), and points to the possibility that collaborative solutions to climate change might require a different type of political or governance approach than the interna-

tional community has used in the past (Prins et al. 2010), and maybe even a different kind of science (Verweij et al. 2006).

While the concepts and criteria for (super-) wickedness remain contested and are not directly relevant for this project, the notion that there might be something special—something particularly difficult—about climate change, is intriguing. This section briefly outlines possibly unique problem characteristics that might render climate change a problem *sui generis*. Further, the section provisionally selects and combines some of these characteristics, whose potential cognitive effects as promoters of or obstacles to cooperation will be explored in more depth with this research.

1. Special Problem Characteristics

a. Pervasiveness and Complexity

In contrast with other global governance problems climate change is characterized by an unprecedented level of complexity due to the problem's pervasiveness. This term implies that beyond its global, transboundary character, which it shares with other problems, including trade, ozone depletion or biodiversity, climate change has causes and effects at almost all imaginable natural and social system scales with multiple linkages and cross-scale dynamics. Sources of GHG emissions and land-use change are not limited to a few countries or industry players like in the ozone case, but include individuals, households, firms, industries, transnational networks, and governments around the world. Consequently addressing climate change requires almost universal changes of behavioral patterns, especially with regard to energy use. Climate impacts can be experienced by organisms, plants and species with limited temperature ranges, by ecosystems and climatic systems with tipping points, by all life on the planet

from the depth of the acidifying oceans to the heights of the warming atmosphere. Climate change affects all natural systems that provide vital services for human societies, including food, clean air and water, natural resource harvest, temperature, or flood control. The problem fundamentally challenges all current economic structures and social organizations.

Another contrast between climate change and other global governance challenges is the fundamental importance of implicated structures for human civilization, progress and productivity. Energy production and supply systems are the backbone and lifeblood of any society, which makes efforts to change or abandon the existing constellation of actors, resources and infrastructure extraordinarily difficult (T. Homer-Dixon 2006, chap. 2; Foreword to T. Homer-Dixon 2010) and qualitatively different than, for example, replacing ozone-depleting substances with non-harmful ones in a handful of industries. Transforming the global fossil fuel industry will be disruptive not only for the industry itself but for entire societies. The economic, political and social changes required are staggering.

These two features—pervasiveness and the need to transform global energy systems—might also render climate change a special collective action problem. Global challenges that require several actors to collaborate are not uncommon. Climate change falls into this standard category, since somewhere between ten and twenty states are needed to significantly reduce global GHG emissions and manage land-use change (Victor 2006, 95). However, one could argue that beyond this minimum requirement of multilateralism, more actors—and not only state-actors have to collaborate to set the world on a path to carbon-neutrality. Developing countries might be required to use some energy technologies, but not others; companies might have to change their business models and surrender to certain types of regulation and taxation; individuals might have to accept limits to their personal freedom, such as flying or

meat-eating. All of this takes place in a global environment where power and vulnerability with respect to climate change are very unevenly distributed and the collective interest is contested, where inequality within and across countries is high, the global population keeps growing, urbanization is increasing, and many global governance institutions are showing signs of stress. Taking these circumstances into consideration, the collective action problem in response to climate change appears to be qualitatively different than the coordination of twenty states to reduce GHG.

b. Uncertainties

Climate change governance needs to deal with comparatively high levels of uncertainty regarding numerous important questions about both natural and social systems (Pachauri and Reisinger 2007, 27, 73). This includes the specific climate response to increased levels of atmospheric GHG concentrations, the effects of different levels of warming on major physical systems (Shackley and Wynne 1996; Latif 2011), the impact of environmental changes on human well-being, and finally the effects over time of potential policy options (Dessai, O'Brien, and Hulme 2007). Again, uncertainty is not unique to climate change—Levin et al. suggest that complexity and uncertainty are two out of five problems generally associated with global environmental problems (Levin et al. 2009)—but the scale and dimensions of uncertainty related to climate governance might be unprecedented.²

c. Long Time Scales

Some of these uncertainties are linked to the circumstance that the climate systems works on long time scales and displays significant time lags between an initial change and the system's response, e.g. the increase of average atmospheric GHG concentration and the associ-

² For details regarding the treatment of uncertainty in the 4th Assessment Report of the IPCC, see the “Uncertainty Guidance Note”: <http://www.ipcc.ch/meetings/ar4-workshops-express-meetings/uncertainty-guidance-note.pdf>

ated increase of global average surface temperature. Climatic changes take place over multiple decades, centuries and millennia, rather than years or election cycles (Pachauri and Reisinger 2007, 46–47). Similarly, there is potentially a large time window between the implementation of a climate policy and the policy’s impact on the climate system. Given the numerous uncertainties one cannot know how big the effect of a particular policy would be or how one would measure it. The time-delay also makes it difficult to predict with precision when or over what time period that effect would manifest.

Under these conditions a standard cost-benefit analysis combined with discounting becomes increasingly difficult, if not impossible. The combined challenge of long time scales and major uncertainties have given rise to a debate among distinguished economists about the general utility of these analytic tools in the case of climate change. The arguments center on the possibility of “fat-tail” events—low probability but high impact occurrences with catastrophic implications for a society (Weitzman 2009). Lemoine and Traeger are among the first authors who attempt to model the economic impact of tipping points and their interactions with climate policy (Lemoine and Traeger 2012). Yet, time-discounting is not only standard practice among policy-makers but also among the public (Jacobs and Matthews 2012).

Further, the long time-scales raise a number of important questions regarding intergenerational ethics for which there are few and unsatisfying analytical tools (Gardiner 2011).

d. Limited Observability

Since climate change is a very slow-moving problem from a human and especially political perspective, humans have severely limited abilities to directly observe or experience the threat and full consequences of climate change with the human senses. Some impacts like the increasing frequency and severity of extreme weather events might be easier to detect than

others like ocean acidification and species extinction. The problem of limited observability includes constraints on people's cognitive ability to link cause and effect. One simply cannot see, feel or otherwise experience how much warming is caused by the emission of one ton of carbon dioxide, or one commute to work in the family's SUV. An individual might be able to observe gradual sea-level rise in a particular place in the course of her 80-year lifespan, but sea-level rise takes place over several centuries and has different effects along the various coastlines of the world. Similar arguments can be made about ice sheet loss and ocean acidification. Any individual might get a glimpse, but nobody can get the full picture. Accepting that our senses are of little use for understanding what is causing climate change, and what types of threats societies are facing, all climate-related decision-making has to rely to a large extent on abstract and synthesized information provided by scientists and technical experts and on imagination. This might have implications for the relevance of affect, but more importantly it elevates the importance of scientific experts and public communication processes for climate politics.

These observations need to be qualified in two respects. First, many individuals especially in the developing world are already experiencing diverse effects of climate change in their daily lives, for instance, less reliable weather patterns, more frequent and more intense extreme weather events, or coastal erosion and sea-level rise. Individuals engaged in the political process are likely to associate these personal observations or indirect observations by fellow citizens with climate change. The same phenomenon of observation and experience-based beliefs about climate change has recently begun in the developed world, with increasing floods in the UK, wild fires in Australia and sustained drought and intense east coast storms in the US.

e. Tipping Points

Over the last few years, climate scientists have pointed out that the global climate and various climate subsystems could exhibit tipping points—“a critical threshold at which a tiny perturbation can qualitatively alter the state or development of a system” (Lenton et al. 2008, 1786). Examples for tipping elements include various ice sheets (large ice volume vs. none), the Atlantic thermohaline circulation (on vs. off), and the Indian Summer Monsoon (strong vs. weak). Recently researchers have become more cautious concerning the possibility of global-scale tipping points (Lenton and Williams 2013), and continue to emphasize a number of major uncertainties concerning the conditions and timing of such events (Lenton 2012).

Broecker was among the first to express concern about the possibility of climatic tipping points in 1987 (Broecker 1987). However, the concept tipping point is not new or specific to the climate system. It is often used interchangeably with the terms threshold, regime shift or critical transition. And it does not only apply to natural systems like the climate, but can also frame one’s understanding of social system change. Malcolm Gladwell’s book *The Tipping Point* (Gladwell 2002) popularized the concept, although Gladwell’s tipping points refer to very different phenomena (e.g., the spread of a fashion fad) than those that concern Lenton and others who seek to understand possible characteristics of the climate system. I adopt Broecker’s and Lenton’s definition that emphasizes the nonlinear or rapid character of systemic change (“sudden rather than gradual”), which is driven by internal system processes such as feedback effects.

Tipping as a specific system behavior could have very serious implications for the well-being of human societies, which have evolved in and adapted to the stable climate system over the last 10,000 years. The possibility of climate tipping points therefore poses major

challenges for the design of climate governance institutions. Gardiner suggests that the growing awareness of the possibility of tipping points should be welcomed because it could undermine the current political inertia and therefore “help us to act” (Gardiner 2009, 140). Nuttall also argues that the idea of tipping points has major discursive power and prompts “discussion characterized by a nervous anticipation of the future.” (Nuttall 2012, 97). Similarly interested in the effect of sudden or abrupt climatic changes on individual risk perceptions, Hulme and Bellamy come to a more differentiated conclusion, arguing that different value systems determine the effect of tipping point concerns on individual beliefs about climate change risk and action (Bellamy and Hulme 2011). However, to my knowledge there have been no studies on the effect of the tipping point concept on the beliefs of climate change decision-makers.

f. Multiple Simultaneous Stresses

An often underestimated feature of climate change is its likelihood to produce multiple simultaneous stresses for social systems, rather than one-off and bounded emergency events. Droughts, fires, pests, floods and coastal storm surges in different regions of the world can place multiple simultaneous stresses on global food systems that can trigger crisis cascades in social and economic systems. One such case has already occurred, although it remains unclear whether all individual stresses can indeed be linked to climate change: in 2010 a heat wave and fires in Russia, floods in Pakistan and China, and a drought in China all converged to produce major stress in the global food system, which might have contributed to the uprisings in North Africa and the Middle East (Werrell, Femia, and Slaughter 2012).³ Similarly multiple stresses on water availability due to shifting hydrological conditions are not unlikely.

³ <http://thinkprogress.org/romm/2011/02/04/207460/contribution-of-high-food-prices-to-mideast-unrest/>,
<http://www.npr.org/2011/02/18/133852810/the-impact-of-rising-food-prices-on-arab-unrest>,

These systemic stresses could have knock-on effects for health systems, international trade, poverty alleviation, disaster risk management and international security provision.

g. Lack of Intentionality and Moral Rules

Finally, two characteristics of climate change are particularly interesting in a conflict and security context. The lack of intentionality or hostility on behalf of those who cause the potential harm (indirectly with GHG emissions and land-use change), and the vast geographic distribution of the major contributors, makes it very difficult to attribute blame to a certain group. In other words it is almost impossible to identify an enemy. This characteristic also renders strategic thinking in the conventional sense of IR—game theoretic responses to enemies in an anarchic world—useless. Further, the absence of moral rules for atmospheric/environmental changes means there might be an absence of moral and emotional arousal (Grasso 2012), which is often a key ingredient for political action against a looming threat.

2. Cognitive Responses to Special Problem Characteristics

Some or all of these characteristics of climate change might affect the cognitive ability of individuals and the international community to respond to the challenge cooperatively. Below I outline arguments for exploring the cognitive effects of pervasiveness, long time scales and limited observability on actors' preparedness to cooperate.

a. Pervasiveness and the Loss of Hope

Preparedness to act on climate change requires first of all the cognitive possibility of success, which includes mental representations of a goal (e.g., limiting global warming to 2°C) and pathways towards that goal (e.g., mitigation timetables, energy system transition plan-

ning). Goal selection and pursuit is a form of agency. If success is dependent on the actions of others, an individual's assessment of the chances to come to a cooperative agreement (e.g., perceptions of other actors' willingness to mitigate, or beliefs about one's ability to influence others' willingness to act) can strongly affect his or her sense of agency. The psychological theory of hope suggests that goal pursuit, pathway thinking and agency are linked by hope (Snyder 2002), and consequently the loss of hope diminishes an individual's sense of agency (McGeer 2004).

Success, as it is currently defined in the global policy process, necessitates the cooperation of many actors in the form of an effective agreement under the UNFCCC umbrella.⁴ Given the unprecedented problem scale and complexity, and past negotiation failures, one would expect that some actors experience hopelessness at certain points in the negotiation process. Loss of hope along with a sense of agency, especially the dynamics of spreading hopelessness, could play an important role for the collective ability to find a cooperative agreement. Apart from its treatment in psychology, hope has been a theme in a diverse set of literatures, from which I draw some brief examples below.

Towards the end of the Cold War Beardslee describes the nuclear threat in terms that also apply to climate change: "unknown and uncertain territory," "threat is abstract, outside people's experience, yet overwhelming in its horror and scale," "... it engenders a sense of powerlessness and hopelessness," "... and yet the great majority of adults take no action whatsoever." Along these lines Kefford compares the psychological effect of the threat of nuclear war with that of climate change (Kefford 2006). He suggests that the overwhelming threat of nuclear war lead to widespread apathy and despair, rendering thinking about the future use-

⁴ For some actors that assessment might change with the development of geoengineering technologies and a growing understanding of their costs and effects.

less. Expecting the same public response to climate change, Kefford argues that denial and apathy should be turned into political mobilization for climate change mitigation, similar to the nuclear disarmament movement. Expanding on these ideas, Courville and Piper argue that NGOs can use hope for political mobilization towards social change (Courville and Piper 2004).

Several authors have used hope rather intuitively as an explanation for the inaction of societies in the face of an overwhelming problem in historical and political essays (Tuchman 1987; Hamilton 2010) as well as in literary works (Hamilton cites, “The Plague” by Albert Camus, 1947).

Treating the loss of hope as a potential cognitive response to the pervasiveness of climate change, combined with past negotiation failures, this research explores whether and to what extent actors experience hope and hopelessness during the UNFCCC negotiations.

b. Time Scales, Limited Observability and Myopia

The majority of personal, ethical and political decisions in modern societies have a limited time-horizon. For individual choices, the relevant time line can range from days to a few years, in rare cases a few decades, for instance, when buying life insurance or having children. Most political choices in democracies are driven by election cycles (about five years) and economic dynamics, fewer by the lifetime of infrastructure projects (several decades) or major social security systems (a generation). Decision-making with a time-horizon of more than 50 years is practically unknown in the public sector. This implies that there is a fundamental mismatch between the decision timelines modern societies and political actors are used to (years to decades), and those of climate change (centuries and millennia). It also means that humans have no experience to build on when making choices regarding climate change.

The standard rationalist approach to decision-making is cost-benefit analysis (CBA)—comparing different available paths of action, one always chooses the option that maximizes the difference between expected gains and losses (net benefits) over a distinct time period. Economists have long debated the *role of time in the process of cost-benefit analysis*: how does one value costs and benefits occurring in the present vs. those one expects to occur in the distant future? Two distinct responses to this question have been developed (Loewenstein, and Elster 1992, Introduction). One side suggests that it is “natural” for individuals to discount the future, pointing to a number of reasons why humans are prone to valuing the “many temptations of the present” higher than the less certain promises of the future. A second camp argues that the value of present and future assets is and should be treated equal. The prevailing practice of discounting in economic and political decision-making in modern societies is indicative of the power of myopia. A recent study by Jacobs and Matthews offers empirical evidence that citizens also discount the future (Jacobs and Matthews 2012). This is of particular relevance for climate-related decision-making, because effective climate policies would have considerable and well understood short-term costs, but mainly long-term and more uncertain benefits. In other words, the current generation is required to pay a relatively certain price for preventing future generations’ less certain harm. Under these conditions a CBA results in inaction—the (perceived) costs simply outweigh the (perceived) benefits, as long as the current generation of decision-makers sufficiently discounts the future.

However, in the global climate debate one can observe not only those actors who seem to succumb to shortsighted decision-making in the face of a long-term problem (e.g., the US, India, Saudi Arabia), but also those who are able to take long-term consequences and time lags into consideration, and strongly argue for fast political action despite the short-term costs.

(e.g., AOSIS, LDCs, climate justice movement). What causes the difference between these perspectives? Are their thoughts based on different time-lines? A rationalist scholar would answer that the long-term thinkers have probably more to lose, or that their losses are expected earlier and therefore not as heavily discounted. They might also add that the long-term thinkers would not incur any costs of action since they are poor and do not have any significant mitigation potential.

Other explanations for the different attitudes observed among climate negotiators could include differences in their social value systems and definitions of intergenerational justice, and differences in attitudes towards nature and ‘environmental stability’. Both of these factors are elements of a society’s social identity and its dominant ideologies. Finally, some individuals might simply have a higher capacity for abstract thinking and imagination than others.

Using this mismatch of decision- and problem timescales as a point of departure, this research project will explore the different cognitive-affective processes for dealing with the long time scales of climate change and the question of discounting in CBA, in particular the different emotions associated with sensory experience vs. abstract, scientific information. Further it will explore the issue of imagination: (how) do individuals imagine the long-term future, in particular tipping point events and their social consequences (Wagner and Zeckhauser 2012).

V. THE PILLARS OF A FRAMEWORK FOR COGNITIVE ANALYSIS

Integrating the insights gained from the literature review above, a provisional theoretical framework for the cognitive analysis of global climate politics should consist of the following analytic dimensions:

(1) Cognitive Elements: Each actor has specific mental representations concerning (a) the structural opportunities and constraints of agency, (b) the identity of the self and others (in- and out-groups), and (c) the actor's understanding of justice. Actors also have mental representations of climate change and its characteristics, for example, its pervasiveness, associated uncertainties, and the possibility of tipping points. All of these representations have emotional valences of differing intensity.

(2) Cognitive Structures: These and other mental representations and the links among them form stable and emotionally coherent cognitive structures, which can be visualized as cognitive-affective networks.

(3) Cognitive Processes: Processes such as decision-making and cognitive change are constrained by emotional coherence. The theory of cognition as a process of emotional coherence (Thagard 2006, chap. 2) assumes that cognitive elements have emotional valences, and that decisions are based on a process of multiple constraint satisfaction, taking into consideration both the cognitive acceptability of a mental representation and its emotional valence.

An actor's interactions within a social group or with other material realities provides input for cognitive processes. Based on these interactions the unique problem characteristics of climate change can affect the ability of individuals and groups identify cooperative solutions to this particular collective action problem. Rational decision-making might be an important cognitive process, but is likely to be severely constrained in the case of climate change due to high levels of uncertainty, difficulties of quantifying certain costs and benefits, and systemic time lags. Consequently I expect myopia and the absence of imagined futures to be relevant

cognitive features in some belief systems about climate change and cooperation. Another important cognitive process is likely the effect of the loss of hope on agency-related beliefs.

The link between individual and collective cognition is best understood as one of multi-level interacting mechanisms, involving cognitive mechanisms at the individual level and social mechanisms at the group level.

The mental processes that generate thoughts and beliefs have a neural basis—thinking is a brain function. More importantly, all mental representations refer to things in the world, either physical ones like trees or cars, or socially constructed ones, like states or war, which depend on a shared belief about the existence and meaning of those entities.

The framework offers opportunities for empirical testing and is able to integrate neo-realist and constructivist theories.

CHAPTER 3

Cognitive-Affective Mapping—Method, Findings and Limitations

This chapter presents the results of my empirical efforts to identify existing belief systems among participants in the global climate negotiations using cognitive-affective mapping (CAM). Section I introduces the method and section II outlines how I selected participants for this project. Since this is one of the first sustained research efforts using the CAM method (Findlay and Thagard 2012) and the first using interview data, I offer a number of observations in section III about the practical experience of generating CAMs in interaction with study participants, the potential value of cognitive-affective mapping for social scientific research, and some limitations that affected this dissertation project in particular. Section IV summarizes the CAM content, structure and narratives. This data form the foundation for the theoretical findings I present in chapter 4.

I. COGNITIVE-AFFECTIVE MAPPING

Cognitive-affective mapping is a qualitative research tool to identify, visually represent and analyze existing belief structures (Findlay and Thagard 2012; T. F. Homer-Dixon et al. under review). A cognitive-affective map is a network diagram or concept graph that “displays not only the conceptual structure of people’s views, but also their emotional nature, showing the positive and negative values attached to concepts and goals.” (Thagard 2012). The networked representation of sets of connected concepts is based on neural network research in the cognitive sciences that conceptualizes and simulates brain processes in terms of

connections between populations of neurons that can be modeled computationally (Galushkin 2007).

Cognitive maps have been used in the past (Axelrod 1976; Bonham 1993; Novak 1998), but there are a number of features that distinguish CAMs from previous approaches and make it particularly suited to this study. The most obvious and theoretically relevant novelty introduced by CAMs is the ability to include affective information, adding an important layer of data about mental states and processes (Mercer 2010). Affect is the combination of emotion, mood, and motivation. Recent literature in multiple disciplines including psychology, political science and decision studies, has emphasized both the need to integrate affect in the analysis of human behavior (Damasio 1995; G. F. Loewenstein et al. 2001; Lebow 2005; Vohs, Baumeister, and Loewenstein 2007; Sasley 2011), but also the methodological difficulties of doing so (Crawford 2000; Bleiker and Hutchison 2008).

In contrast to Axelrod's mental maps (Axelrod 1976), CAMs do not focus exclusively on causal beliefs, but on the network of all relevant concepts for a given subject matter. In the context of global climate change politics, this can include concepts related to climate science that explain the nature of climate change as a phenomenon in nature, the definition of equity, or the values a person considers threatened by climate change impacts. This approach results in a fuller or more comprehensive picture of the different mental representations that create a person's belief system and serve as motivations or inputs into decision-making processes.

In addition to being more comprehensive, CAMs have the unique ability to reveal not only belief content but also cognitive structure—the unique constellation of connections between different mental representations that ultimately create meaning. This topological feature adds value to the qualitative inquiry into belief systems. Going beyond more conventional text-

based analysis, which has to build on a linear ordering of statements or sentences, CAMs “provide an immediate gestalt of the whole system and of the simultaneous interactions between, and relationships among, its parts.” (T. F. Homer-Dixon et al. forthcoming, 3–4).

CAMs are special—affective—versions of mental models and the CAM generation process (see below) is a method for the elicitation of mental models (Carley and Palmquist 1992; Jones et al. 2011).

1. The Nature and Limitations of CAM

The main elements of a CAM are (i) network nodes, which represent discreet cognitive elements (mainly single concepts or propositions), (ii) emotional valences of these nodes (positive, neutral, negative, ambivalent), and (iii) links/connectors that represent relationships (or their absence) between two nodes.

(i) (ii) There are four different types of nodes, depicted with different shapes and colors. Positive nodes are shown as green ovals, neutral ones as yellow rectangles and negative ones as red hexagons. Ambivalent concepts are concepts that a person perceives as positive in some contexts and negative in others, for example, a sports car as a status symbol and source of joy vs. its role in a fatal accident. Hence, ambivalent concepts are depicted as a combination of an oval and a hexagon (purple). The thickness of a shape’s edges represent the emotional intensity associated with the node on a scale from one to three (both positive and negative).

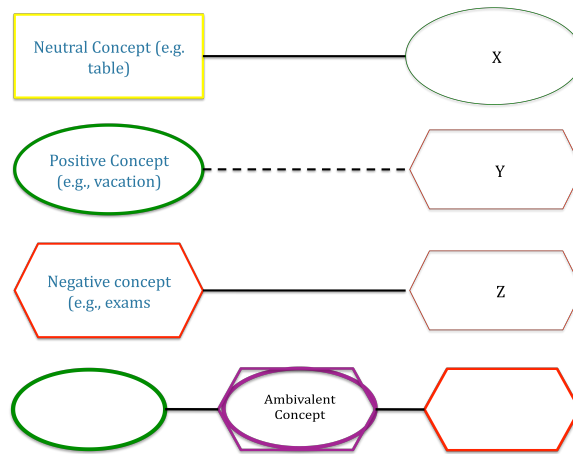
(iii) Links are lines connecting two nodes, indicating both the emotional and logical relationship between the two concepts (see Annex Ch3-1 for details). CAM links are symmetric (i.e., undirected), allowing the emotional loadings of each node to influence the other. Which

direction dominates in any given moment depends on a number of factors, including priming effects. This feature creates the potential risk of making a CAM unreadable. A reader might not be able to clearly identify the beliefs that the CAM seeks to represent given the multiple possible interpretations of the relationship between two or more nodes.

There are two different types of links. Solid lines indicate emotional coherence or compatibility between concepts. Emotional coherence exists between two concepts with the same emotional loading—(not) liking one concepts implies (not) liking the other. Emotional incoherence exists if there is a relationship between two concepts with different emotional valences. Related to but different from the emotional association between concepts is their logical connection, which can be based on constitution, causality, co-occurrence, or any other type of relationship that implies a connection (good or bad). The absence of a link indicates the lack of a relationship between the nodes.

Links can have varying strengths on a scale from -3 to 3, indicating that the strength or importance of a connection between two nodes can differ. The factors that influence the strength of a link have so far not been explored, but they could include availability and quality of evidence, whether the linked beliefs rest on personal experience or abstract information, uncertainty, newness of concept, or the source of information about a concept, for instance, a trusted person with shared values, an expert, a stranger (Kahan, Jenkins-Smith, and Braman 2011).

Figure 3-1: CAM Elements and Link Types



This way of representing the cognitive reality of an individual is strongly influenced by recent cognitive theory, most importantly, the theory of emotional rather than just cognitive coherence (Thagard 2006). Consequently CAMs are highly simplified representations of one aspect of cognition—the emotional structure of belief and value systems—that necessarily ignore other elements of the mind and mental processes. This simplification is useful for some analytic purposes, but comes with a number of limitations regarding what the method can and cannot deliver. These and other issues regarding the nature and limitations of CAMs are discussed in more detail in Appendix Ch3-1, which contains the standard protocol for addressing these in the context of this research.

2. Data Source: Semi-Structured Qualitative Interviews

One can generate CAMs in a number of different ways, including the use of software tools such as [Empathica](http://cogsci.uwaterloo.ca/empathica.html) (Thagard 2010a).⁵ One can ask research subjects to develop their own CAM of a specific issue after an introduction to the CAM technique and the formulation of

⁵ Empathica, which is available for free, was created in 2011 by fourth-year software engineering students at the University of Waterloo. Learn more at <http://cogsci.uwaterloo.ca/empathica.html>.

the topic to be mapped. Alternatively the researcher can generate the CAM based on data gathered with qualitative interviews or based on primary and secondary text sources, including published statements, speeches, journal articles, statutes, and observations. One can verify the validity of a researcher-generated CAM in a (second) interview with the research subject, providing the opportunity to correct the map by adding, deleting or changing concepts, emotional valences or links. Another way to verify an initial CAM that is based on text sources is to have other researchers generate a CAM based on the same source material, and then compare the results. The next section outlines the approach I adopted for this study.

I conducted 55 semi-structured interviews with study participants to generate the input data (transcripts) for CAMs. 52 of the interviews were recorded, maximizing data quality and ensuring that the CAMs used the language and terminology chosen by participants. The interview instructions emphasized the confidential nature of the conversation and asked the participants to talk about their personal opinions rather than the official (negotiation) position of the organization they represent. The questions covered eight different themes: the science of climate change, expected climate change impacts, the (political) nature of the problem, solvability, ideal solution and obstacles; interest definition and cost-benefit analysis, assessment of COP 17 in Durban, concern about climate tipping points and imagining a 2080 worst-case scenario of climate change. Appendix Ch3-2 contains the list of interview questions.

The questions were open-ended and designed with an important trade-off in mind. On the one hand it was important to allow to participants to steer the conversation in a direction that was most meaningful to them and to insert as much of their subjective views as possible. It was a key purpose of the interviews to reveal differences in the ways individuals think about the issue of climate change and multilateral cooperation, and therefore the interview structure

had to leave room for such participant-driven differences. On the other hand, the goal of the interviews was to generate CAMs that would be comparable to some degree. The interview questions provided thematic anchors that generated conceptual clusters open to a comparative analysis. To strengthen comparability across interview responses, I sought to clarify the views of participants in later interviews on concepts that had frequently been used in earlier interviews.

There are a number of insurmountable challenges associated with the attempt to study individual cognition using an interview approach. First, it is impossible to know or verify whether participants are honest and speak about their personal beliefs. The possibility that participants present positions of the organizations they represent as their own, or present opinions they believe are appropriate or expected (e.g., from a moral standpoint) rather than their own beliefs, can simply not be excluded. This is a general problem for social scientific research and not unique to this study. For this particular research design dishonesty is not a major setback. If the opinions provided differ from the private beliefs of the participant, the person apparently preferred to be seen as holding the stated beliefs. The answers provided must be at least coherent (make sense) in the participant's mind, and are therefore possible beliefs one can hold. In this sense even dishonest answers provide useful data.

A connected problem concerns diplomats who have a dominant civil servant persona, and identify strongly with their role as a representative of the state. This can result in the development of two parallel belief systems—a private one, and one that is shaped and constrained by the values and responsibilities of a civil servant. It is possible that a diplomat tasked with climate change negotiations develops a rich subset of beliefs about the climate issue within the belief system as a civil servant, while ignoring the topic as a private individ-

ual. Such a separation existed in at least one of the 36 interviews I conducted with diplomats. Taking my invitation to speak about private beliefs seriously, the participant attempted to think on the spot and provide honest answers as a private individual. However, this private belief system seemed to be weaker than the civil servant beliefs, which may therefore have strongly influenced the views expressed during the interview.

Finally, the stability of participants' beliefs over time is unclear, raising the question whether their responses would have been different on any other day or under different circumstances. Various factors influence the interview situation (e.g., mood, stress, an earlier meeting), and can make certain concepts more or less important than they would have been at a different point in time (priming effect). Since the interviews were conducted under very different conditions—some in participant's offices, some during the UNFCCC negotiation session Bonn in May 2012, some in person, and some via Skype or phone—these influences are not comparable and not even knowable. Again, this is not a unique problem for this study. However, some elements of the research design alleviate this problem by giving participants the opportunity to present and correct their opinions outside the interview situation and on their own time (see CAM follow-up below). Neither the CAM nor the Q Study can address the possibility that a study participant changed his or her mind in the study period (e.g., between the interview and the Q Sort).

3. Process: Generating CAMs

I generated 55 CAMs based on interview transcripts, using the following protocol for each map. After carefully reading the complete transcript, I selected and marked key concepts in the text—single words or short phrases—while assessing their emotional valences based on

In order to verify that the CAMs generated this way reflect the thoughts of the research participants, I sent each participant their CAM draft (.png file), and provided instructions for reading a CAM. I included a short interpretation of some aspects of the CAM and included a number of clarifying questions. The email invited the participants to provide feedback regarding the nodes and their emotional valences, but also the placement and strength of links. The standard email text is provided in Appendix Ch3-3. If such feedback was provided, I revised the CAM and sent the corrected image to the participant. The quality of the feedback suggested that participants understood the technique and were generally satisfied with the depiction of their views. In most cases they suggested adding concepts or links, or changing the emotional valence of a certain concept.

In addition I sought to validate that the CAM generation process is not completely idiosyncratic in the sense that multiple researchers would generate similar results when using the same text source and instructions. Two colleagues familiar with the method volunteered to generate a CAM based on one (the same) interview transcript. I compared the two CAMs produced by my colleagues with my own CAM measuring the percentage of substantial overlap, that is, the share of identical concepts and their emotional valences used by more than one researcher. Given that the interview transcript contained about 6,000 words, the number of possible concepts to choose from was likely larger than 1,000, and a CAM rarely exceeds 150 concepts, a match of more than 50% can be considered a satisfactory validation of the method.

The CAMs produced by my colleagues were significantly less detailed than my own—with 68 and 62 concepts they were about half the size of the original CAM I had produced. I limited the comparison to the concepts contained in these two CAMs, a total of 95. My CAM

contained 74 of these 95 concepts (78%). 18 concepts (19%) were contained in only one of the three CAMs (ten in the CAM produced by one colleague; eight in the other). While 19% is a significant failure rate concerning the identification of relevant concepts, it is impressive that each researcher would pick at most ten such concepts out of more than a 1,000 possibilities. In addition my two colleagues have significantly less contextual knowledge about multilateral climate change negotiations, which makes the limited selection of non-agreement concepts a fairly strong validation of the method. Among the remaining 77 concepts 35 (45%) were full matches (i.e., identified by all three researchers), and 42 (55%) were partial matches (i.e., identified by two researchers).

A similar comparison was made for the emotional valences of the 77 concepts that were identified by more than one researcher. The emotional valences assigned by all three researchers matched in 46 cases (60%). For 18 concepts (23%) there was a partial match (two researchers), and there was disagreement regarding the remaining 13 concepts (17%).

Overall this effort confirmed that the method is able to produce fairly consistent results although the CAMs generated by different researchers will inevitably contain differences in terms of the number of concepts included, the relevance of concepts and the emotional valences assigned to the concepts.

While this process added two layers of data verification it also suffered from a number of weaknesses with respect to the data required for a CAM with high empirical validity. The most important shortcoming is a lack of data about the strengths of links. Since no information is available that allows the researcher to quantify the strength of the links, the initial setting of weights is strongly driven by the intuition and background knowledge of the researcher. Although I requested feedback from participants particularly related to the weight of

links, no such feedback was ever given. Providing this information for the high number of links in each CAM would be very time-consuming and probably challenging for an individual. Given the research context and the difficulties of recruiting participants, it was practically impossible to gather the data required to create links with a satisfying empirical foundation. The only indication for the validity of the link weights assigned by the researcher in this study is the fact that participants did not request any changes in response to my email eliciting feedback. Since some participants might not even have looked at their CAM, or read the instructions for reading a CAM carefully, this is not a very reliable indicator.

Similar challenges apply to the strength of emotional valences of nodes. In some cases emotive language ('horrible', 'extremely frustrating', 'fear') helped distinguish stronger affective loadings from weaker ones. But due to time constraints and the type of study participants it was not possible to gather sufficient information to assign all emotional valences based on satisfying empirical evidence.

All 55 CAMs have been anonymized for the purpose of publication, and are included in Appendix Ch3-4.

4. CAM Analysis

CAMs are open to at least two different analytical approaches. The first approach uses a coding scheme to explore the content of CAMs—the existing concepts, ideas and meanings as well as emotional information related to the concepts. The second approach seeks to identify relevant network structures such as concept and meaning clusters and the relationships between them. Each analytic lens was applied to the individual CAMs and to six groups of CAMs (see the participant matrix below).

The content analysis was driven by a coding effort that reflected the overarching research question of this study:

What cognitive elements and processes promote or inhibit cooperation to achieve effective responses to climate change?

Its aim was: (1) to identify the most relevant concepts in existing belief systems, (2) to assess to what extent cognitive assumptions of major IR theories match the cognitive reality in the case of global climate change politics, (3) to understand the role (if any) of the unique characteristics of climate change in the belief systems of individuals involved in the global political process.

The coding scheme (see Appendix Ch3-5) was divided into three parts. The first sought to identify concepts related to theoretical expectations of the decision-making models of major IR theories (e.g., costs, benefits, identity, norms). The second part of the coding framework focused on the special characteristics of climate change and their reflection in the beliefs of the study participants. This included the identification of beliefs about complexity, the existence of tipping points, long-term climate impacts, and responsibilities to future generations. Finally, the coding effort sought to identify other concepts that might be relevant but do not fit the two categories above (e.g., hope).

Second, the structural analysis consisted of a purely qualitative visual analytic effort to identify belief clusters, and connections between them, more and less central or well connected concepts, and tangential beliefs in the CAMs. This approach had a much less defined starting point, because with a few exceptions (Rosenberg 1988) there are no theories about the structure of belief systems. I attempted a visual analysis of the CAM images to identify network substructures (clusters) and links between these. However, the complexity of the subject matter and consequently highly interconnected CAMs made it impossible to derive useful

comparative insights using this qualitative approach. I summarize a small number of observations at the end of this chapter, but these do not match the quality and extent of the observations made about the conceptual content of the CAMs.

Nevertheless, a structural analysis would be valuable and possible when using a quantitative rather than qualitative approach. It would require a specific software program to perform network analyses that can account for the different types of nodes and links in a CAM. The program could compute values like network centrality (i.e., the level of connectedness), identifying important conceptual hubs in a CAM. It could identify existing clusters of concepts and their boundaries, and potentially address questions related to emotional valences, for instance, which CAMs or clusters are predominantly positive or negative, which ones have a comparatively high amount of ambivalent or neutral concepts, and so on. Ideally such a quantitative network analysis would be merged with qualitative information. For example, not all highly connected nodes might be important in terms of meaning, but a quantitative analysis would not be able to detect the difference.

Third, I complemented the content and structural analysis with a comparison of the narratives reflected in the interviews and CAMs. I use the term narrative to describe the essence of a person's belief system—its emotional logic—that is necessary to make sense of the climate governance challenge. A narrative has to answer basic questions regarding governance protagonists (i.e., relevant actors), the nature of the climate problem, and the challenges and solutions associated with it. I derive these narratives from the interview transcripts and the CAMs, seeking to distill a story-line that connects the most important conceptual elements and their relationships. My approach is closely linked to Bruner's functional account of narratives (Bruner 1991), which seeks to identify the roles or purposes of narratives for an individual.

The narrative analysis sought to reduce each CAM to 25-30 key concepts and their link structure. This set of essential or core concepts had to be able to tell the same story as the larger CAM and formed the basis of the verbal narrative I developed using the concepts provided by research participants. Individual points of view were not included as narratives if they were not part of a larger belief pattern in a group.

The analysis proceeded in clusters, using the six participant groups (see below) as clustering device that enabled in-group as well as cross-group comparisons. Non-state actor groups were paired with the group that reflected their interests most closely.

II. SELECTION OF STUDY PARTICIPANTS

The participant selection criteria and process for this project had to satisfy the requirements for both cognitive-affective mapping and the Q study. The key goal was to identify different points of view held by participants in the global climate change negotiations. Therefore participant selection had to ensure a minimum diversity among the perspectives of study participants without the need to be globally representative or comprehensive.

With respect to diversity of views, the CAM and Q method requirements for participant selection align very well. Q method is somewhat more demanding regarding the strategic sampling of participants, often emphasizing that the selection of participants needs to ensure that the most important viewpoints on the topic are included (see chapter 5). However, the aim of this research project was to explore the nature of existing belief systems and to theorize about their content and structure. The aim is not to assess their political relevance, or the possibilities for reconciling existing differences in the negotiation process. Therefore the importance of a view is not a key concern for this study. Further, the question whose views are

most important in the context of global climate politics does not have a straightforward answer.

All study participants are participants in the international negotiation process under the umbrella of the UNFCCC. This group includes diplomats (i.e., representatives of governments) and representatives from a variety of observer organizations, including non-governmental organizations (NGOs) from civil society and the private sector (e.g., industry associations and companies). From here on I refer to all three types of observer organizations as NGOs.

The introduction to this dissertation already offered a justification for working with diplomats rather than decision-makers at the national level. The following sections provide (1) a detailed description of the design of the participant selection process, and (2) a summary of the results of the selection process, including the conventions I use to refer to groups of participants, ensuring the confidentiality of individual responses.

1. Selection Process Design

Given the multiplicity of variables that can influence a person's view on multilateral cooperation and climate change, participant selection with the aim of capturing a diversity of views had to simplify the existing complexity, keeping in mind the practical challenges of recruiting participants of an ongoing, contentious and time-demanding political process.

a. Diplomats

For diplomats this could have been achieved in various ways, for example, selecting two countries from each of the major negotiation blocks. I rejected this approach for three reasons. First, the alliances are changing over time, their number has been steadily increasing, and

there is significant overlap between them. Second, the reasons for being in a negotiation alliance can be political or historical rather than a shared set of interests and views regarding global climate governance. The best example is the G77 and China, a diverse group of 133 countries with often contradicting views on climate change, but held together by a historical context of colonialism and late development (Najam 2005). Third, this study seeks to understand the privately held beliefs of participants in the climate negotiations, and these might differ from the positions presented by the negotiation alliances they are part of.

Instead of mirroring existing organizational patterns, I identified two variables that can reasonably be expected to influence the perspective of individuals representing a certain country. First, the home country's relative contribution to the problem in terms of relative level of emissions is relevant because it determines the power to contribute to the solution through mitigation and also the potential costs of addressing the problem. People who live in high-emission countries are expected to have more concerns about the costs of action, and therefore be more reluctant to support a cooperative multilateral framework than people from low-emission countries. Second, the expected severity of impacts of climate change within the home country—vulnerability—is likely to influence perspectives. Individuals from highly vulnerable countries are expected to focus on the costs of non-action or delayed action, and to favor a cooperative multilateral approach to avoid expected harm and damage.

I distinguished between three categories of emitters—high, medium and low—and two categories of vulnerability—high and low (for measures and cut-offs see below). The combination of these two variables resulted in a 3x2 matrix displayed in Table 3-1, and consequently six different groups of countries or country profiles, for example, High Emitters and High Vulnerability (HEHV).

Table 3-1: Participant Groups - Diplomats

LEVEL OF NATIONAL CO₂ EMISSIONS

		LEVEL OF NATIONAL CO ₂ EMISSIONS		
		High	Medium	Low
VULNERABILITY	High	Group 1 – HEHV	Group 2 – MEHV	Group 3 – LEHV
	Low	Group 4 – HELV	Group 5 – MELV	Group 6 – LELV

This group matrix provided the starting point for participant selection. Each group contains a different number of countries and most likely a variety of viewpoints. Among all the countries that fit the criteria of a group, I selected a minimum of three, and reached out to individual members of the national delegations to invite participants. I identified individual names using the UNFCCC participant list at COP-17 in Durban in 2011. I included one or two individuals from each country, regardless of their role in the delegation (e.g., heads of delegation, area experts). Personal networks and interactions in the course of the fieldwork helped identify some individuals.

There are a number of problems associated with this process of identifying participants; I will address the three most important ones in turn.

(i) The variables I use to create six groups of participants (emissions and vulnerability) have to be based on objectively measurable qualities of the home countries of these individuals (see below for measuring challenges). However, the participants identified or individuals from the respective countries more generally might have very different subjective assessments regarding these variables and might place their own country in a different group accordingly. For example, the measures I applied place Canada in the high emissions & low vulnerability categories (Group 4-HELV). Some Canadians might object and point out that the fast chang-

ing Arctic and long coastlines makes Canada highly vulnerable to climate change, and that therefore Canada belongs in Group 1-HEHV.

This discrepancy between objective and subjective assessment could weaken the goal of including a diversity of views because some groups might end up being underrepresented or not included at all. This is an insurmountable challenge, since it is impossible to elicit participants' views before selecting them. However, this problem applies to individuals in all groups and the effects of an inappropriate group assignment should cancel out.

(ii) The creation of three categories along the emission dimension and two categories along the vulnerability dimension is a major simplification of the complex reality of the processes and system characteristics involved (e.g., different emission sources or different kinds of vulnerability).

Determining numerical cut-offs between high, medium and low emissions is not straightforward given the massive differences among country's emission profiles. I decided to create three rather than two categories to reflect the following features of current emission profiles. There is a small set of countries whose emissions are one or several orders of magnitude larger than the emissions of everybody else. This group has major overlap with the G20. Even within this group there are major differences. The annual emissions of the top five emitters (China, US, India, Russia, Japan) range between 1.0 and 8.3 billion tons of CO₂, while the emissions of other group members is still far below the one billion mark. A significant number of countries have very small, almost insignificant annual CO₂ emissions (e.g., small-island and developing states). There is a large group of countries with neither extremely high nor negligibly low emissions. This group deserved its own category rather than being split in the middle and placed with the high or low emitters. Again, the countries captured here represent

a large range of different emission levels. Based on these features of the global CO₂ emission distribution, I placed the cut-offs for high emitters at 200 million tons/year, and for medium emitters at ten million tons/year. These cut-offs are based on the latest available data from the US Energy Information Administration, published in June 2012, for year 2010. The distribution of countries among the three groups is 25 (high)—74 (medium)—118 (low). A complete list with cut-offs is included in Appendix Ch3-6.

Determining a cut-off between high and low vulnerability is equally challenging. Especially in middle of the distribution it seems arbitrary to place countries in different categories. However, given the number of dimensions along which countries' vulnerability profiles differ, a more differentiated approach would have added very little value while imposing major complexity to the group matrix. The disadvantages of adding weakly defined vulnerability categories leading to more than six country groups outweighed the potential benefits of a more sophisticated reflection of complex realities.

(iii) The variables used for the group matrix rely on existing measures of national emission levels and vulnerability, which face a number of challenges.

Data on national GHG emissions worldwide is scarce and incomplete. There is no single data source that contains information for all GHG gases and all countries. The UNFCCC gathers data primarily on GHG emissions for the 42 countries that are listed in Annex-I of the Kyoto Protocol, including Land Use and Land-Use Change (LULUCF) numbers with the latest data point in 2009. The International Energy Agency provides data on global carbon emissions up to 2009 without a ranking. I used data provided by the [US Energy Information Administration](#), which covers only CO₂ emissions from energy consumption up to 2010 and does not include LULUCF.

There are some fundamental definitional and measurement problems regarding countries' vulnerability to climate change (Adger 2006). I provide a short summary of some of the key issues below, and outline the approach used for categorizing countries for the purpose of this study.

Starting point for the different attempts to measure vulnerability is the definition provided by the Intergovernmental Panel on Climate Change (IPCC) in its 3rd Assessment Report in 2001: “the degree to which a system is susceptible to, or unable to cope with, adverse effects of climate change, including climate variability and extremes. Vulnerability is a function of the character, magnitude and rate of climate variation to which a system is exposed, its sensitivity and its adaptive capacity.” (IPCC 2001, 995 (Annex B)) One could summarize this definition in a formula: $Vulnerability = Exposure + Sensitivity - Adaptive\ Capacity$. A more recent IPCC definition speaks of “the propensity or predisposition to be adversely affected.” From here a variety of approaches takes off in very different directions.

Exposure measures tend to be most advanced. They are based on geological, physical, biological or chemical variables for which quantifiable data is available. But even within this sub-field there are major differences between the types of climate impacts social systems can be exposed to, for example, coastal erosion vs. droughts vs. floods, making a comparison difficult. Further, the forecasting methods employed have significant limitations.

Measuring sensitivity requires the assessment of the resilience of the system (e.g., the age and health of a person exposed to heat wave). This can involve multiple, system-specific, dynamic variables, posing major challenges of quantification and cross-case comparison.

Finally, measures of adaptive capacity, defined as the ability to anticipate, cope with and adapting to certain impacts, has to consider multiple factors, including knowledge access, re-

source availability, technological advance, or social capital. Adaptive capacity is often equated with level of development, in other words the Least Developed Countries tend to have the least adaptive capacity. However, this might be a misleading simplification. For example, highly developed communities in the US are assumed to have high adaptive capacity, but might be incapable of addressing the problem for various reasons, for example, ideological forces like the Tea Party that block adaptation initiatives, or even encourage behavior that increases risk exposure. An example for the latter is North Carolina's legislative effort to rule out considerations of non-linear sea level rise by state planners in order to encourage continued development along the coastline (Phillips 2012). Less developed communities in poorer countries on the other hand might have strong social capital, and be smart in leveraging international support for adaptation, greatly reducing their vulnerability to climate change.

Since vulnerability is a dynamic phenomenon shaped by the interplay between constantly changing biophysical and social processes in often very complex multi-scale systems, it is "not easily reduced to a single metric and is not easily quantifiable" (Adger 2006, 274). Assessing vulnerability involves a combination of social and environmental data as well as projections of future changes. Generalized measures of vulnerability therefore are often composites of different components, for instance, community type, time period, climate stimulus, that seek to capture certain dimensions of the difficult concept, and often have a certain purpose in mind, such as disaster risk reduction. This aggregation of measures is often intransparent and the source for sometimes significant differences across indices and rankings. In addition normative considerations are often interlaced with the analysis. One of the most basic issues is the fact a vulnerability measure at the country level cannot capture the various levels and types of vulnerabilities experienced by communities, organizations and individuals within that

country. Further, most existing studies focus on developing countries, and do not allow for a consistent global comparison. To my knowledge only one of the existing vulnerability measures takes indirect effects of climate change into account, such as trade effects, import dependencies, disruptions of int. supply-chains, (Vincent 2004), or is able to assess a community's future adaptive capacity, rather than its present one.

To sum up, the available indices and rankings need to be approached carefully, distinguishing the indicators and aggregation methods, as well as motivating normative perspectives. Since the use of the a vulnerability index for this study had a very limited purpose—identifying study participants with different points of view—I canvassed a range of existing vulnerability indices ([Global Adaptation Index](#) [GAIN] by the Global Adaptation Institute; [Global Climate Risk Index](#) by Germanwatch; [Climate and Regional Economics of Development's Vulnerability Index](#) [VI-CRED] by the Stockholm Environment Institute; [Climate Vulnerability Monitor](#) [CVM] by DARA; [Environment Vulnerability Index](#) [EVI] by UNEP/SOPAC; [Structural Vulnerability Assessment](#) [SVA] by FERDI; [Geographic Distribution of Climate Vulnerability](#) by SEDAC, Columbia University), and chose to work with a combination of two indices that combine a general emphasis of adaptive capacity (Global Adaptation Index) with data for 2010, and exposure to extreme weather events and natural disasters (Global Climate Risk Index) with data up to 2011. Some of the indices mentioned do not have global coverage (EVI, SVA), do not provide rankings (CVM), or do not offer country-level assessments (VI-CRED).

The GAIN index provides a ranking of 161 countries (cut-off between low and high vulnerability at 80) according to an aggregate measure that combines vulnerability to climate-

related hazards and readiness to adapt to the challenges posed by climate change; higher rankings indicate lower vulnerability. The ranking is included in Appendix Ch3-7.

The Global Climate Risk Index (CRI) is focused on the impacts of extreme weather events, using data gathered by the global re-insurance company MunichRe. Rather than forecasting into the future, the index is an assessment of past and current damages caused by floods, droughts, hurricanes and other extreme events. It offers two rankings for 183 countries (cut-off at 91): one for average numbers over the last 20 years (1991-2010), and a current one for 2010; higher rankings indicate higher vulnerability.

The two indices place only two countries that are part of this study in different vulnerability categories: Brazil and Colombia. Colombia has experienced major La Niña impacts recently and has shot up from rank 47 (already high) in CRI's 20-year average to rank two in the 2010 index. This merited Colombia's placement in the high-vulnerability category despite its GAIN ranking of 67. The case of Brazil is less clear with a GAIN ranking of 63 and a CRI ranking of 23 in 2010, but only 96 for the 20-year average. Additional considerations like the possibility of an Amazon tipping point (Lenton 2011b), and the diversity of environmental and economic conditions due to the size of the country lead me to include Brazil in the high-vulnerability category, although most indices would consider it to be only moderately vulnerable to climate change.

The results of the selection process for diplomats are presented in Table 3-2. Individual participants are shown by the countries they represent. The 36 participating diplomats, among them twelve delegation heads, represent 30 different countries. The share of women (11) was 31%. For confidentiality reasons the remainder of the study will refer only to the groups these individuals belong to (Group 1-HEHV, Group 2-MEHV, Group 3-LEHV, Group 4-HELV,

Group 5-MELV, Group 6-LELV); not to their country of origin, or position within the delegation.

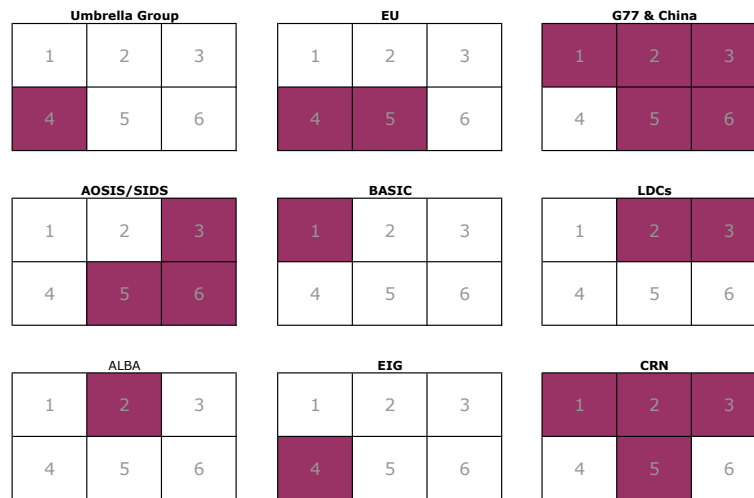
Table 3-2: States Represented by Participating Diplomats

Emissions	High (>200mill t CO2)	Medium (>10mill t CO2)	Low (<10mill t CO2)	Total
Vulnerability				
High	South Africa Brazil Indonesia	Bangladesh Guatemala Pakistan Philippines Colombia Bolivia	Botswana Grenada Mozambique Namibia Uganda Dominica Samoa	
	3	6	7	16
Low	US (3) Canada (2) Germany Japan South Korea (2) Australia	Argentina Singapore Denmark Sweden (2) Finland (2)	Iceland Barbados Cape Verde	
	10	7	3	20
TOTAL	13	12	11	36

The participants include members of the Umbrella Group, the European Union, the G77 & China, the Alliance of Small Island States (AOSIS)/Small Island Developing States (SIDS), the Least Developing Countries (LDCs), the Bolivarian Alliance (ALBA), the BASIC group (Brazil, South Africa, India, China), the Environmental Integrity Group (EIG), the Coalition of Rainforest Nations (CRN), and the recently formed Alliance of Independent Latin American and Caribbean States (AILAC). AILAC was formed at the Bonn negotiations in 2012 and since it did not exist when this study was designed it is not part of Appendix Ch3-8 or Figure 3-2 below. Some relevant groups and countries are not included, in particular India, China and oil-producing Middle Eastern countries. Many of these players have recently formed the Like-Minded Group. The main reason for these gaps is the lack of response from the multiple indi-

viduals contacted. A table detailing the membership of participants in current UNFCCC negotiation groups is detailed in a table in Appendix Ch3-8. Figure 3-2 below shows the match between these negotiation groups and the six participant groups in this study.

Figure 3-3: Participating Diplomats and Current Negotiation Groups in the UNFCCC



b. Non-state Actors

Since non-state actors do not represent countries, but usually speak on behalf of a certain interest group, I could not apply the selection criteria for diplomats. Instead I developed a typology of NGOs based on the type of interest they seek to protect using the list of participating observer organization at the UNFCCC COP-17 in Durban. I identified eight types of observer organizations: youth, faith, development, environment, environment & market, business & technology, fossil fuels, local government. This list is not comprehensive, and there is some significant overlap between the different types (e.g., faith and development or business and fossil fuels). I identified at least one organization in each category and invited an individual representative to participate. Table 3-3 summarizes the results of this process.

Table 3-3: NGOs and Private Sector Actors represented by Participants

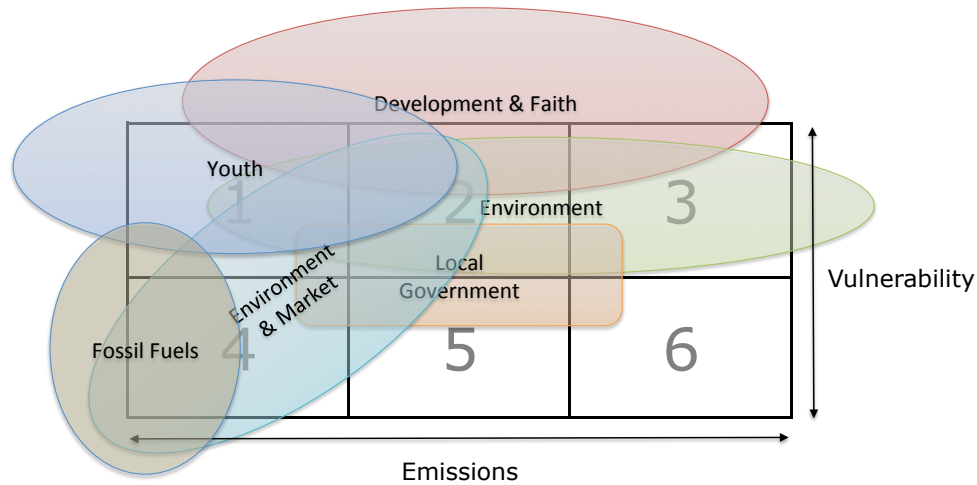
Type	Observer Organization
Youth	Earth In Brackets (EIB) SustainUs Climate Action Network (CAN)
Faith	World Vision Christian Aid
Development	ActionAid International Germanwatch
Business & Technology	World Business Council on Sustainable Development (WBCSD) Global Carbon Capture and Storage Institute (Global CCS Institute)
Fossil Fuels	World Coal Association (WCA) World Steel Association (WSA) International Council on Mining and Metals (ICMM) Shell
Environment & Market	National Round Table on The Environment and the Economy (NRTEE) Environmental Defense Fund (EDF)
Environment	Amazon Conservation Team (ACT) World Wildlife Fund (WWF) (2)
Cities	Local Governments for Sustainability (ICLEI)
Total	19

The 19 participating individuals include eight different nationalities. Most are from the US and Canada, but the group also includes Indian, Brazilian and South African nationals. The share of women is 42%. Throughout the study, reference to the beliefs of one of these 19 individuals will be made by reference to the non-state actor type, for example, Youth NGOs.

Based on the alignment of the interests of state representatives and non-state actors, one could expect some overlap between the six-group matrix for diplomats and the eight NGO types identified above. For the purpose of the CAM analysis I created the following groups of diplomats and non-state representatives:

- Group 1-HEHV – Youth NGOs,
- Group 2-MEHV – Development and Faith NGOs,
- Group 3-LEHV – Environment NGOs,
- Group 4-HELV – Fossil Fuel Industry, Business and Technology Actors,
- Group 5-MELV – Environment & Market NGOs, Local Government.
- Group 6-LELV

Figure 3-4: Potential Interest and Viewpoint Alignment between State and Non-state Participants



2. Results

The resulting group of 55 participants includes individuals from 32 countries, representing 30 states and 18 different civil society and private sector organizations. The share of women is 35%.

III. PROCESS OBSERVATIONS

The eight-month process of recruiting participants, conducting interviews, and generating CAMs based on transcripts has provided a number of lessons about the value of cognitive-affective mapping as a method for social-scientific research, but also about the challenges of using it in an empirically driven project.

The interview-based use of the method is very time-consuming. Apart from the normal requirements of recruiting participants, scheduling meetings, conducting interviews, following up with emails, and transcribing interviews, the real work for a CAM analysis begins after these tasks. Working with roughly 15-20 pages (6,000-10,000 words) of transcribed interview

text for each participant, it took six to eight hours to create the initial CAM for each participant and additional time to request feedback from participants and to make the necessary changes to the CAM if such feedback was provided.

It is challenging for the researcher to determine which concepts are important enough to be included in the CAM and which ones can be ignored. This observation raises the question of what level of detail is needed and useful. The CAMs I generated generally contain 120-150 concepts. The validation process demonstrated that ‘thinner’ versions would have been possible. It resulted in CAMs containing roughly 60 concepts. In addition, the effort to generate core CAMs containing only 30 concepts showed that such simplification is possible and useful, but that it comes at a significant cost—the loss of meaning and detail. Ultimately the useful level of detail will depend on the purpose of the research and the questions it seeks to answer. Studies that seek to isolate a small number of key concepts will prefer a minimalist approach that can reduce large amounts of text data to a few essential concepts. Studies that explore existing systems of meaning without prior knowledge might prefer to start with very detailed CAMs. In my case, the combination of a detailed CAM and a strongly reduced core CAM offered the richest insights and in-depth learning about the existing cognitive patterns.

Below I include an illustration of different levels of CAM detail. I generated the first and third CAMs; a colleague produced the second based on the same interview transcript. The three CAMs present the same data about the same belief system, but with three different levels of detail.

The empirical effort also raised the question whether a single CAM is able to capture the various beliefs of an individual on a complex issue such as climate change governance. At a certain level of detail or abstraction, it might simply not be possible to represent conceptual relationships appropriately. The verbal material generated in the interview process—if taken seriously—places strong constraints on the concepts that can be used to create a CAM. While it might often be desirable or even necessary to unpack certain concepts in order to represent coherent conceptual relationships, this was not possible in this study due to the lack of an empirical base for such unpacking. Other projects might experience this less as a constraint if they are able to contact study participants multiple times to gather more data and to ask clarifying questions that can help produce a more coherent map. In my case the interview transcripts contain the universe of possible concepts, and respecting those limits I encountered numerous consistency challenges that I was not able to resolve with the available data.

Further, it might be valuable to create not one but several CAMs that deal with the various sub-issues raised in the interview. This might be the best approach for dealing with the use of time—thoughts about the present state of the world vs. the imagined future state of the world—and with the problem of presenting indirect beliefs, in other words beliefs about the beliefs of others. These issues are addressed in more detail in Appendix Ch3-1.

Despite these challenges cognitive-affective mapping offers a number of advantages that make it a valuable instrument in the toolbox of social scientists, even in fields unrelated to the cognitive sciences. A key strength of this approach is its ability to generate in-depth understanding of another person's beliefs and ways of thinking that is more powerful and more rigorous than interview-only techniques. My understanding of the beliefs of interview partners differed significantly pre- and post-CAM generation. One reason for this qualitative differ-

ence might be the necessity to grapple with questions about the importance of concepts and the links between concepts, even if those concepts were mentioned in very different parts of the interview.

Second, the opportunity for data verification through interaction with the participant using a visual representation is a major advantage of this tool compared with other interview techniques. The follow-up conversations can sometimes be even more important than the initial interview, revealing a number of misunderstandings and faulty assumptions about what was meant rather than said. This leads to a significant improvement in the quality of the interview data. And finally the reduction of a body of text to discrete concepts and its transformation into an image that distinguishes between substance and structure allows for an easier comparison of beliefs across individuals. While this might not be a useful contribution to process-tracing studies, it can greatly enhance discourse and text analysis, studies on political deliberation and argumentative strategies, foreign policy analysis, conflict resolution, interpretive approaches and case studies that focus on individual leaders and their decision-making, for example, operational code studies.

IV. SUMMARY OF CAM CONTENT, STRUCTURE AND NARRATIVE

This section reports the results of the comparative analysis of the belief systems of the 55 study participants using the CAMs generated in collaboration with them. I treated content and emotions jointly, and consequently analyzed each CAM in three iterations, focusing on content, structure, and narrative respectively.

1. Group 1 – High Emitters With High Vulnerability (6)

This group includes diplomats from South Africa, Brazil, Indonesia and three members of youth NGOs.

a. Content Analysis

All three diplomats in this group use concepts that largely fit a rational cost-benefit framework of decision-making. For NGO representatives the picture is less clear. All six individuals distinguish two different types of costs associated with climate change. The first type are costs imposed by climate impacts, which diplomats usually detail with reference to their own country, for example, “People trapped in poverty,” “Stranded assets,” “Water scarcity,” “Land loss.” The second type are cost concerns related to a loss of competitiveness as a consequence of climate policies. This second type applies in particular to the emerging economies in the BASIC group, but also for the US. The diplomats also connected observed (not merely expected) economic and development costs to climate change, which provided the motivation for engaging in climate negotiations with the goal to avoid or manage future costs. They linked the competitiveness issue to what one might call global power management—the US’ concern about relative economic decline is considered an obstacle to multilateral cooperation. Interestingly one diplomat and all three youth activists did not associate major climate-related costs with their respective home countries but with others, for instance, “The most affected” and “The most vulnerable” people in Africa and parts of Asia, or the poor in developing countries. In this case the motivational power of these costs was still sufficient, although it was disconnected to the person’s national community. All six group members expressed strong concern about different forms of human suffering: threatened livelihoods, poverty, food shortage, or extreme weather events.

The Youth NGO representatives were all concerned about costs to people elsewhere, especially the impact of food shortages and extreme weather events. Two mentioned the possibility of death due to natural disasters. All three emphasize identity-related losses as costs: "Loss of homes, identities and cultures," or "Loss of the world as it always was." Only one diplomat raised similar concerns. Two NGO representatives experienced such ideational costs personally: the loss of seasons in places where the person grew up, and sadness about changes in local forest expressions. These examples point to the importance of place-based identity and subtle connections to the environment. Two individuals stated that national interests and political self-interest, such as making profits or trade group interests, are obstacles to solving the climate problem.

Only one individual explicitly identified the "avoidance" of "long-term costs of inaction" as a benefit; otherwise benefits of action remained implicit and unspecified.

Concepts related to identity and norms and justice formed a major part of all of these CAMs, but were particularly prominent in the belief systems of the NGO representatives. Each individual had a slightly different definition of collective identity, pointing to various groups inside or outside the negotiations they identify with. Unsurprisingly all three diplomats have a well-developed national identity and used a number of concepts, often place-related or environmentally relevant in the climate context, for example, "A dry country," "A tropical country," "Low-lying coastal areas," to describe this in-group. Two diplomats also recognized that their home country is a significant future contributor to climate change, which burdens their national identity with a 'moral dilemma.' The use of these concepts suggests that identity modifications are currently incorporating this attribute ("contributor to climate change") into the self-image of these countries, and also affect the norms of justice these individuals con-

sider applicable to themselves and their home countries. Diplomats identified other groups that they attributed with different kinds of agency and obligations, including “The most vulnerable” (in-group), “The West” (out-group), and the community of states (in-group). All three diplomats clearly distinguished between developed countries (out-group), developing countries (in-group), and a third category called emerging economies, major emitters or big developing countries.

This distinction between categories of countries was much less prominent in the CAMs of the youth activists. The North-South divide featured strongly in only one CAM, and there is not a single mention of the emerging powers. Instead these individuals identify with “every human being under 25,” “The Youth Climate Movement” or “The Future,” trying to give this nebulous actor voice in the present UN process.

All six CAMs contain normative elements that indicate a preference for multilateral cooperation. Three individuals believe that those who cause a problem or harm someone are responsible for addressing the problem proportionally to their share of causal responsibility, regardless of intentionality. The shared norms include cooperation that is pro-poor, pro-vulnerable, and is based on inclusive decision-making in the UNFCCC.

One NGO representative argued that the nature of the climate problem is an ideological and moral conflict between the global North and South. Climate justice is the primary goal, which means that addressing climate change is not enough, but that a “grand equalization of the world” has to be achieved through North-South resource flows, poverty eradication and economic development in the global South.

In addition to the global-level equity discussion the Youth NGO CAMs reveal a second normative trend that draws attention to local and community values. Two individuals believe

that focusing on sustainable, low-carbon life-styles as a source of happiness and meaning, and on a value system that builds on the idea of taking care of each other to create a better future, are important elements of a multilevel solution to climate change.

All six individuals consider state governments to be key actors, acknowledging that domestic action, and possibly bilateral initiatives should complement multilateral cooperation. The diplomats argue that state agency is constrained in the sense that some goals cannot be achieved by a certain subset of states (e.g., “Major Emitters,” “The Developed Countries alone”). One diplomat argued that climate change is a two-level game, in which national circumstances in the US are holding the international negotiations hostage. Two NGO representatives confirm this view when they express concern about the role of the domestic electorates in North America and campaign finance rules in the US.

Only two individuals have a good appreciation of the scientific complexity involved. They use a systems view that links goals, time-horizons and systemic lags, arguing that ambition will have to increase the longer action is not taken or that the available pathways to the 2°C target are increasingly limited. Further, two NGO representatives address the problem of climatic tipping points and see a certain novelty in the scale or complexity of the problem.

b. Narrative

I identified four different narratives in this group: *A New Development Model*, *Addressing Historical Grievances*, *Multilateral Solidarity*, and *The Global-Local Link*.

A New Development Model: This narrative has two variations. At its core is the argument that climate change is a serious challenge for humanity, but especially for poor communities, threatening economic development, identities and security. Addressing this problem is primarily the responsibility of those who caused the problem with past emissions—the devel-

oped countries—but increasingly that of the emerging economies, who will be responsible for a large part of future emissions. The solution for this challenge is a new development path that does not copy the fossil fuel-powered development of the industrialized world. One variation of the narrative points to the low-carbon nature of this new development model and the need to constrain consumption. The second variation goes further, arguing that we need a new aspirational model of the poor that will motivate the necessary changes in the development model. Only the developed countries can create this new aspirational model, because their model and success orients the developing countries.

Addressing Historical Grievances: Climate change has been caused by developed countries, but will affect the developing countries severely. The historical emissions of the developed countries are the source for their moral obligation to both mitigate the problem and provide resources to the South for mitigation and adaptation (climate justice). But addressing climate change is not enough. Rather the moral responsibility of the developed countries includes the obligation to address development and poverty eradication in the developing world. The purpose of the negotiations cannot be to save future generations by abandoning people living today. There must be trade-offs between the two goals. Climate change is an opportunity to equalize global conditions of a currently unfair distribution of prosperity in the world.

Multilateral Solidarity: Climate change is a truly global problem, and within the global community all countries must help each other deal with it. Everybody—the major emitters and the developing countries—should act boldly now. The US is the biggest obstacle to such multilateral cooperation. Due to their domestic situation their positions are holding the international negotiation process hostage.

The Global-Local Link: Both climate change impacts and the solution to climate change have a global and a local dimension. The problem severely affects the global poor, but there are also local losses in the developed world, mainly related to environmental changes in the communities where we grew up or where we live. The global solution needs to combine scientific effectiveness (i.e., staying within the 2°C target) and global equity (i.e., allowing developing countries to grow). There are strong links between this global goal and the domestic and even local dynamics. First, domestic politics and electorates can present major obstacles to the global process because their values and positions shape governments' negotiation positions. Second, value change at the individual and community level can make important contributions to solving the climate problem. Third, the young generation can give voice to the future in the UN process.

2. Group 2 – Medium Emitters With High Vulnerability (10)

This group includes representatives from Bangladesh, Bolivia, Colombia, Guatemala, Pakistan and the Philippines. Non-state actor groups associated with this cluster are two faith-based and two development NGOs.

a. Content Analysis

The individuals in this group address various issues associated with a rational choice framework, including the costs of action (mainly mitigation) and inaction (climate impacts), national interests, and the global distribution of power. All group members are concerned about the costs of climate-related extreme weather events, which have affected either their home countries or regions of the world they have worked in. They all agree that climate change will affect everyone around the world, but that only certain countries and communities in the developing world will suffer because they have limited coping capacity. This disproportionate effect of climate change is the key driver of the equity concerns raised by all but one individual in this group. Notably, all of these individuals refer to damages and suffering to-day—often based on personal experience—rather than future impacts of climate change.

Two diplomats and one NGO participant mention costs to humanity or the international system as a consequence of climate change, for example, “Threat to Humanity’s Survival” or the “Loss of Countries.” Further, they all share an interest in development and economic growth, although two individuals consider it fundamentally problematic that the dominant economic discourse equates development with growth. Almost all group members talk about the need to change current consumption patterns of the rich to enable growth in the developing world. Two diplomats recognize the importance of power differences, and the link between the costs of climate action and the desire of various actors to maintain (US, EU) or to

change (China) the current global balance of power. Two NGO representatives make a more limited claim, arguing that the economic costs of climate action are reasons for inaction because they contradict national and big business interests.

Half of the group believes that the selfish pursuit of national interests is an important obstacle to addressing climate change. Often this argument is associated with the idea that people in developed countries have to change their current lifestyles and their consumption patterns. One individual goes even further suggesting that national interests contradict the UN agenda, apparently separating his support for development and poor people from the notion of national interest. He also argues that alternative political forums to the UNFCCC, for instance, the G20, are interest-driven and therefore not effective when it comes to addressing climate change.

The CAMs of this group include a broad range of identity concepts. The most interesting contrast is the reference to two very distinct primary in-groups: the state and humanity. All six diplomats but only one NGO representative have a strong national identity and make numerous references to their home country, especially when describing important impacts of climate change, framing their country as a victim of climate change. However, two diplomats emphasize the notion of one humanity—the largest possible in-group of human beings—and global community, and even expand this in-group by locating humans in a larger planetary system (“Humans as part of a whole” or “Humans as part of nature”). Implicitly they argue for the protection of the Earth system as an integrated whole of humans and their environment. This in-group definition is associated with a set of norms and values that espouse generosity and cooperativeness: “Solidarity,” connectedness, “Equality” and “Thinking about each other as significant partners.” Two NGO participants and one diplomat define their relevant in-group

roughly as all poor people in developing countries, who suffer not only because of climate change, but more broadly because of global inequities created by the development path taken by the rich. These belief systems build on a world divided into two groups rather than 200 countries or a single humanity.

A key group distinction shared by all six diplomats is that between developed, developing, and emerging countries. Only one individual contests the value of singling out the BASIC group as a third category. Vulnerability is an important but contested identity dimension. Finally, two individuals mention today's and future generations as two distinct groups that have the same value and rights and are connected by ethical responsibilities. Interestingly the group label 'emerging economies' is far less important for the NGO representatives. Only one believes that the existing diversity among developing countries should be reflected in the equity discussion, which should move beyond a binary distinction between developed and developing.

Other important normative concepts are inclusiveness, emphasizing the importance of the UN as a forum where everybody has and should have a voice and nobody should be "left out" or "trampled on," and equity. There are different ideas related to the concept of equity, for instance, "Everybody has to commit to something depending on their ability," the necessity of resource flows from the developed to the developing countries, or the demand for lifestyle change in the developed world. Five individuals address the concept of historical responsibility. One believes that the overconsumption of resources by the developed world and their desire to maintain their current lifestyles is blocking the aspirations of people in developing countries. Another perspective suggests "We need to leave the historical burden behind." Interestingly, these two individuals both point out that a "bad" or "wrong" model of develop-

ment has caused not only climate change but also global inequity. A solution to climate change therefore has to be based on a new development paradigm, what they call “the Politics of Wellbeing” or the idea of “Living Well”, and global wealth redistribution.

The importance of domestic politics for international negotiations features in three CAMs. They point to the role of voters in pushing governments to act on climate change, and the more general importance of national circumstances as political constraints on multilateral negotiations. The US is singled out as the country whose domestic situation is blocking the climate negotiations.

Regarding the special characteristics of climate change seven individuals speak about humans as part of a larger planetary system, where everything is connected and where human wellbeing depends on nature being well. Eight individuals recognize the pervasiveness of the problem when they suggest that a solution reaches down into everyday behavior of individuals, or that it requires changing minds of voters and consumers, especially in the developed world. Concepts related to problem and solution time scales are incoherent and patchy, from the idea that we have 20-30 years to stabilize the climate system, to the fear that tipping points could happen 10-20 years from now, to the concern that an agreement under the Durban Platform by 2020 would be too late.

b. Narrative

The CAMs reveal four distinct narratives, somewhat overlapping with Group 1-HEHV: *Addressing Historical Grievances*, *The Helpless Victim*, *A Lost Cause*, and *Policy-driven System Transformation*. Six individuals share the dominant narrative—*Addressing Historical Grievances*—but with significant variations, and in slightly less confrontational terms than the Group 1-HEHV version.

Addressing Historical Grievances: This is a narrative about the global history of injustice. The development path taken by the now developed countries has created two problems: a globally inequitable distribution of wealth and now climate change. The latter is worsening the already unjust situation, leading to even more suffering in the developing world. The primary challenge to be addressed is global inequity—solving climate change has to make poor people better off; at least it must not make them poorer. The rich countries that are historically responsible for causing and solving these interconnected problems are shirking their moral responsibility. They have to provide resources to the developing world in order to equalize global wealth distribution, and to enable a different, clean development path into the future.

There are a number of important variations on this general theme, which places a strong constraint on climate change solutions: they need to promote greater global equity by redistributing wealth. The strongest variation of this narrative is an emphasis on the developed world, especially the US, as *the villain*, who is accused of blocking the aspirations or sacrificing the wellbeing of the poor (*victims*) in the interests of big business (another villain). Consequently, a just solution involves a reduction of wealth and power in one part of the world and an increase in the other. A second variation starts from a similar assumption of historically created inequity, but considers climate change an *opportunity to overcome these differences*, and set the relationship between the developed and developing world on a new cooperative foundation of mutual respect and generosity. A third variation uses the idea of one humanity sharing one planet to overcome the North-South divide with norms of solidarity and helping the poor.

The Helpless Victim: The narrative of the helpless victim is a simple story of an actor who is facing severe costs from climate change, has little capacity to cope with these impacts,

and is unable to address the problem (i.e., its mitigation potential is miniscule). All this actor can do is to ask the rest of the world for help, hoping that everybody will contribute to a solution to their best ability. Nobody is singled out for blame, and the only relevant norm is that those who can ought to help those in need.

A Lost Cause: This is a story of the paralyzing power of economic and political structures. Given the economic costs involved in addressing climate change this problem cannot be solved today. The current market structures do not provide any incentives for change, and short political election cycles make the needed long-term investments impossible. Consequently it is not in the interest of states to act on climate change, which renders the UN impotent. It is up to the next generation of voters to take more risk and responsibility for dealing with climate change.

Policy-driven System Transformation: Finally, there is a narrative of policy-driven change in response to climate change, which requires of multi-level interactions between governments, industry and individuals with the aim to transform current economic structures in line with the target of 2°C average global warming. Using an opportunity framework, focusing on co-benefits of climate action rather than a burden-sharing framework could facilitate the necessary political agreements. This is a story about the need for and path to complex global change—a story without villains, heroes or morality, but reason and responsibility.

3. Group 3 – Low Emitters With High Vulnerability (10)

The group includes Botswana, Dominica, Grenada, Mozambique, Namibia, Samoa and Uganda, and three representatives from environmental NGOs.

a. Content Analysis

The CAMs contain a range of concepts that broadly fit the realist assumptions of rational decision-making based on cost-benefit assessments, national interest and global power balancing. All ten CAMs contain a number of different types of costs related to climate change. Two group members refer directly to the CBA framework (the costs of action today are lower than the costs of inaction/destruction tomorrow), integrating and comparing impact-related costs and policy-related costs. Most of the remaining cost concepts fall into only one of these categories.

All ten individuals perceive present costs of climate change. Diplomats refer to observed changes in their countries, including water scarcity and extreme weather events, including floods, droughts and hurricanes, while NGO representatives refer to climate impacts outside their home country. Nine people emphasize a direct link between environmental damage from climate change and economic costs, which is closely related to poverty. The three NGO representatives mention the impact of climate change on food security and the threat that poor people will go hungry. All seven diplomats and one NGO representative hint at the existential threat posed by climate change—the risk that it can cause the death of individuals (e.g., through violent conflict, extreme weather or starvation), or the possible disappearance of low-lying island states. The latter is a cause of concern even for the five individuals who are not directly threatened by it. Two island state representatives think about threats to their national identity ("Everything we are about," "Change of social fabric," changes in and loss of cul-

ture); which seems to be unique among the diplomats in the group of highly vulnerable countries. More generally, five diplomats and all NGO representatives recognize that climate negotiations are about economic decision making: "Economics drive decisions," "Competitiveness," and the "Fear that mitigation raises the cost of doing business," "Economic barriers have become too big" over time, or the fact that structural economic change will create "Winners and losers." The group offers three different economic rationales for inaction: (i) vested interests, simply resisting policy-driven change of their profitable situation; (ii) the impossibility to impose economic hardship and sacrifice on people in a democracy, and (iii) the management of an ongoing global power shift—something the policy-makers themselves might want to avoid or advance regardless of vested interests in the current system.

Regarding existing identity groups, only four diplomats and one NGO representative make the explicit distinction between developed and developing countries. Others use different language, referring to traditional and more recent polluters, consider very different, non-national actors categories (e.g., younger generations, the global rich in poor countries, the most vulnerable communities) or don't mention these groups at all. However, all seven diplomats mention the emerging economies, either as the BASIC group, as "More Recent Polluters" or "Major Emitters," and demand that they do more. But they also see a lack of leadership and place responsibility for action on the developed countries. Five individuals emphasize the human community or global family as an important reference point for moral obligations regardless of nationality.

The most dominant normative theme among diplomats is the idea that all countries—not only the developed countries—should contribute something to the best of their abilities. The responsibilities of various actors have to be differentiated, but there is broad agreement that

the emerging economies need to do more. Two individuals explicitly point to the stark contrast between ethics and profits, arguing that ethics should be prioritized. They consider inaction a moral failure that is inconsistent with the values of the human community: mutual survival, solidarity and protection of the weakest. Only one person in this group challenges current consumption patterns in the developed world.

Moral norms play a big role in the NGO CAMs. They believe addressing climate change is a fundamental moral necessity. Poverty alleviation and caring for the vulnerable has moral priority. One individual states a very general moral principle: one should alleviate suffering if one can. A more extreme position is taken by another person, who frames fossil-fuel consumption as a crime, even an act of war.

Four diplomats and all three NGO representatives see the relevance of domestic forces as constraints of the negotiation process, and all associate this problem with the US. One individual contrasts that situation, especially the problem of vested interests, with the situation in small developing countries, where such resistance simply does not exist (action is in everyone's interest) or with the EU, where environmental interests have established themselves since the 1970s in now legitimate green parties. Five individuals make suggestions for overcoming this domestic obstacle: changing voter attitudes or public opinion through civil society and the media, in other words, educate the body politic by building bottom-up political pressure to act/do the right thing, or by giving the political elite "access to the scientific and ethical domain" through direct experience and observation of climate impacts, for example with visits to small island states. Two believe that "watershed moments" like extreme weather events could help foster the needed public support.

Similar to Groups 1-HEHV and 2-MEHV, concepts related to the special characteristics of climate change are scarcer and far less consistent across the members of Group 3-LEHV. The concepts used seldom reflect complexity thinking (more so among NGO representatives), but several individuals recognize the pervasiveness of the challenge when they mention that climate change already affects local communities, that current patterns of activities at the community level will have to change, or that the daily life of everyone will be affected. Uncertainty only plays a role for two NGO representatives, who argue that it is not an obstacle, but rather a reason to act decisively. Four individuals do not use concepts related to time at all. Those who do have a strong sense of urgency based on science, and argue that either time is short and that global emissions have to peak in five years. Two of these individuals have identified strong connectors between the present and the future: one is worried about carbon infrastructure lock-in with current investments; the other is concerned about her children's lives. One diplomat argues that the shortsightedness of “those who control the economy” is irrational.

Eight group members consider governments as key actors, but they also acknowledge the importance of civil society in influencing government in countries that are reluctant to act. While many diplomats see decision-making in the UNFCCC as paramount, others and the NGO representatives perceive the UN as—at least temporarily—useless. Since leaders and negotiators merely reflect the views of the people, imposing clear limits on the UN process, change needs to be sought elsewhere, primarily among domestic populations that can lead their governments and in the private sector.

b. Narrative

Unlike in Group 2-MEHV, there is no strong clustering around one dominant narrative in Group 3. However, there are a number of similarities to three narratives in Group 2-MEHV: *The Helpless Victim*, *A Lost Cause*, and *Policy-driven System Transformation*. An additional narratives can be called *Western Voters Have the Power*.

The Helpless Victim: This is a story about severe vulnerability and on the ground realities. The central insight is the fact that addressing climate change through low-carbon development requires offering poor individuals alternative livelihoods that make economic sense. Since there is little domestic capacity to deal with climate problems, the victim state asks the most developed countries (including the US, China and India) to mitigate, to invest in cheaper and clean energy systems, and to support adaptation efforts in developing countries.

A Lost Cause: This is a domestic variation of the lost-cause narrative. It acknowledges that climate change is a serious threat to humanity, and argues that it can only be solved if economic activity is significantly scaled back, revisiting the idea of human needs and adjusting to a new normal. However, this is impossible in a democracy because people would reject any idea of sacrifice in an election. Considering the selfish and shortsighted human nature, the chances to change people's minds in favor of such a solution are not good.

Policy-driven System Transformation: This narrative is about the need to create the next industrial revolution or energy system transformation. It acknowledges that these structural changes will create winners and losers, but it is more concerned with the fate of the poor and vulnerable than the wealthy and industrial players. Governments play a key role, driving this transition through domestic legislation. Bridging the individual and global level, these indi-

viduals are driven by strong ethical convictions and commit their own career to improving the lives of poor people around the world, hoping to benefit the planet and future generations.

Western Voters Have the Power: Individuals sharing this narrative strongly feel that the developed countries “got us here” and therefore have a major responsibility to address the climate problem. At the same time they focus on climate change as a problem facing all of humanity, requiring a collaborative spirit and contributions from all parties, including the emerging economies (see *Multilateral Solidarity*). They recognize that climate politics are subject to economic considerations, which place major constraints on the ability of governments to make strong commitments in the UN negotiations. They see the key to an international agreement in various domestic contexts: people have to lead governments. Since political leaders only reflect the views of their population, the real work has to happen in the domestic political space, especially in developed countries. Mobilizing populations, changing minds and attitudes with the help of civil society organizations and media is the only way to shift the positions of their governments towards climate action.

4. Group 4 – High Emitters With Low Vulnerability (16)

This group consists of Australia, Canada (2), Germany, Japan, South Korea (2) and the US (3). Associated non-state actor groups are fossil fuel and other industry organizations (6).

a. Content Analysis

All ten diplomats in Group 4-HELV distinguish clearly between climate impact-related costs and the costs of climate policy. Regarding impacts, fewer people are concerned about domestic effects than about effects in other parts of the world (9). Three of them point to food shortages as a global impact. Four are worried about different kinds of existential threats: human security and the potential of war (3), the unprecedented disappearance of island states (4). One person expands this thought and considers the international system threatened. All ten diplomats have concerns about the cost implications of climate action; most of them (8) link this concern to the idea of global competitiveness. The loss-of-competitiveness argument is connected to notions like trade-offs between today and the future, the current structure of major economies, the energy-efficiency of current industries, stranded assets, vested interests, and the positive notion of new economic opportunities (e.g., "Green Economy," "Win-Win Thinking," or even a "New Industrial Revolution"). Only two individuals address identity-related costs in addition to material costs, for example, the loss of seasons and no longer sharing a life-experience with future generations.

The six private sector representatives show a different pattern regarding cost concepts. Generally, all six invoke impact-related cost categories that are less severe than those of other groups thus far, for instance, nobody mentions the possibility of lives lost or states disappearing, and identity-related concepts are absent. With one exception these individuals speak about environmental changes exclusively elsewhere in the world, disconnected from their

own lives. Two individuals explicitly state that they are not concerned about climate impacts because humankind has great adaptive capacity and "will do what needs to be done." Three individuals make reference to a "global power game" as a relevant decision framework, implying three different things: the dominance of national economic interests, the relevance of geopolitical alliances, and the rise of China and its competition with the US for superpower status. Unsurprisingly all six private actor representatives employ free-market concepts and frameworks including price signals, consumption changes, market mechanisms as policy instruments of choice, cost-effectiveness, profit motives and self-interest. For four of them technology plays a major role in addressing climate change, for example, carbon capture and storage (CCS) as a bridging technology, or the role-out of low-carbon energy technologies. Two people view climate change as part of a larger set of problems that could be summarized as global resource overconsumption.

Concepts related to benefits of various climate-related policy options are poorly developed. Only two individuals (both diplomats) in the entire group of 16 mention the possibility of benefits. One focuses on economic advantages, such as resource efficiency improvements. The other provides a detailed account why global action is in the national interest: limiting demands for humanitarian assistance after extreme weather events, expanding trade opportunities with developing countries, and because it is a moral responsibility to help those less fortunate.

Only four diplomats but all industry representatives use the distinction between developed and developing countries; five refer to the Annex 1 vs. non-Annex 1 distinction. Only two diplomats mention humanity as a relevant reference group. However, three business representatives mention possible collectives that are different from the state: a global, mental

connection between all people ("thinking as one"), the global community of states and society as a family.

The most striking feature is the absence of any strong norms or justice-related concepts in six out of the ten CAMs of diplomats in this group. Four of them express a serious concern about fairness rather than equity, and one experiences a moral responsibility "to those less fortunate than us," which is closer to the idea of charity and generosity than to the idea of principled responsibility. Three business representatives believe that each individual has a moral responsibility to and for other human beings, society or "the future," countering libertarian notions of individualism. They see the necessity to reduce global consumption as part of these moral obligations. Two of them argue that the old development paradigm is part of the problem because it links progress with consumption. The idea of historical responsibility does not receive any support in this group; five individuals associate negative emotions with this concept and consider it unhelpful or an obstacle to addressing climate change. None of the private actor representatives even mentions this concept. This suggests a strong disconnect between the idea of fairness and the concept of historical responsibility as it is currently used in the climate negotiations.

Nine diplomats and all six business representatives recognize that there are important connections between domestic political processes and international climate negotiations. Only two diplomats point to the US congressional constraint. Ten individuals offer different domestic factors that shape the negotiations: the lack of public support or public pressure on governments that would ensure the electability or political survival of elected officials in favor of climate action, the influence of oil interests, reelection pressures in political systems with

three- to four-year terms, competence fights within governments and the need to beef up domestic policies before committing internationally.

Concepts regarding special problem characteristics are sparse and show only weak patterns within the group. Only two diplomats and two non-state representatives describe the problem as uniquely complex. Seven people acknowledge elements of the problem's pervasiveness. They mention the effects of climate change on the day-to-day lives of citizens, for instance, consumption patterns or "the way of life," including patterns of driving or consuming energy more generally. Eleven individuals consider the importance of uncertainties, especially uncertainties related to climate impacts, causality and attribution, but none of them believes that they preclude a cooperative solution. Four of them mention the difficulties created by popular disbelief associated with impact-related scientific uncertainties. Five individuals do not mention any time-related concepts at all; three others consider the timeframe to be uncertain or unknown. The year 2020 has become somewhat of a focal point: three diplomats consider it too late for a new agreement, but do not provide alternative suggestions for action timelines. Three business representatives mention concepts with an unusually long time horizon. One argues that there will be 100-200 more years of fossil-fuel consumption. Another believes that resource scarcity will lead to commodity price increases in 20-50 years and that one should plan as far into the future as one can think. A third describes climate change as a challenge for multiple generations.

Worth mentioning here is the array of concepts used by this group when asked about the ultimate goal or purpose of climate change governance. The 2°C temperature target features in the minds of seven group members. Others suggest goals like "minimize damage and suf-

fering caused by climate change,” “the number that prevents war,” “avoid unmanageable outcome,” “the human species can survive,” or “reduce the speed of climate change.”

Unsurprisingly, governments play an important role in the CAMs of all ten diplomats in the group. Eight of them consider governments as the key—sometimes sole—actor in climate change governance. Two think about national governments as only one among many actor types at different governance scales from the individual to the global. Four diplomats deemphasize the role of the UNFCCC, suggesting that it is unimportant or that developments outside the UN are currently the only reason for optimism. Five diplomats point to the absence of and need for public support or even pressure that would enable governments to become more ambitious in the negotiations.

Business actors also see governments as the most important actors, but only domestically and not in the UNFCCC. Governments are expected to create national legislation and to establish bilateral or transnational cooperation, most importantly for cap-and-trade systems. The only function of the UNFCCC should be to set international targets. Some consider NGOs important to create the political conditions for change at the domestic level by raising problem awareness and convincing politicians and electorates of the need for policy and behavior change.

b. Narrative

Group 4-HELV presents a unique set of four narratives: *National Interests Trump Collective Ones*, *The Market*, *Agency Diffusion*, and *The Larger Picture: Sustainability*; three of these overlap with previous ones. Further there is a variation of the *Multilateral Solidarity* narrative.

National Interests Trump Collective Ones: This is the dominant narrative in Group 4-HELV with a number of variations. Generally these five individuals take climate change very seriously and expect grave consequences mainly for vulnerable populations in developing countries. While two of them clearly identify benefits of action for their home country, all five focus on the cost burden of mitigation – funding the low-carbon energy system transition – in countries seen as major emitters. These cost burdens are linked to a decrease in the country’s global competitiveness, which contradicts national economic interests. Since these costs are perceived to be politically unacceptable, economic national interests are considered a major obstacle or counterproductive in the negotiations. Two possible solutions are offered to resolve this dilemma: a change in public opinion or bottom-up pressure on governments that counters existing fossil-fuel industry interests (similar to the *Western Voters Have the Power* narrative), and/or a technological breakthrough that would reduce the costs of economic changes.

A variation of this narrative stresses that the current inaction at the international level is simply a reflection of political reality. Governments are constrained by people’s perceptions of climate risks, and their limited willingness to accept drastic measures translates into limited global progress. Based on democratic principles this has to be accepted. This overlaps with *Western Voters Have the Power*.

The Market: This narrative is related to the one above. But rather than focusing on national interests as obstacles in the negotiations it zooms in on GHG emissions as a product of economic activity and the corresponding need to change economic processes. The preferred pathway of change is domestic legislation that utilizes market mechanisms, such as cap-and-trade systems, tax incentives, and public infrastructure investments, to create a carbon price

signal to which business will respond. The basic idea is that actors at all levels—individuals, firms, industries, and states—are rational and will respond to incentives that align desirable behavior with their immediate, economic self-interest.

Agency Diffusion: This viewpoint deemphasizes the particular role and responsibilities of state governments and the UNFCCC. Instead it focuses on the complex nature of the climate challenge and the distributed authority and capacity to act across multiple spatial and system scales from the individual to the global, including the private sector, civil society and the media. The standard categories of developed and developing countries play no role at all in this ahistorical and amoral narrative. It is a pragmatic, forward-looking approach focusing on the limited possibilities within the current political structures, and it is in that sense similar to the narrative of *Policy-driven System Transformation*.

The Larger Picture: Sustainability: This narrative sees climate change as part of a much larger sustainability challenge, which is in essence about the overconsumption of global resources (“consuming more than one Earth,” “threatening the planet’s functioning’), driven by a development paradigm and social value set that links progress with consumption and individualism. Two different solutions are put forward. One focuses on increasing the efficiency and productivity of resource use (“prolong resources required for life as far into the future as you can think”). The other is a complementary change in social values towards a more community and future-oriented set of norms that limit consumption. Individuals play a large role in this narrative, both as consumers and as citizens who can be mobilized to accept political changes or to bring about the needed changes at the ballot box. This creates a strong overlap with two previous narratives: the *Global-Local Link* and *Western Voters have the Power*.

Multilateral Solidarity: This narrative also uses as a starting point a sincere concern about future climate change impacts in other parts of the world, but in addition to recognizing the costs of sharing the global mitigation burden these individuals emphasize that any agreement has to be fair. There is less clarity on how fairness or equity could be defined, but the BASIC countries need to play a bigger role.

5. Group 5 – Medium Emitters With Low Vulnerability (10)

This group includes Argentina, Denmark, Finland (2), Singapore and Sweden (2). The associated non-state actor groups are environment and market NGOs and a local government organization.

a. Content Analysis

This group displays a number of interesting patterns regarding the rational frameworks of cost-effective action, but concepts related to national interests and global power balancing are almost absent. With regard to the costs of climate change, five individuals emphasize the suffering of poor people (e.g., increasing poverty, hunger, personal catastrophes and disease) and six emphasize social costs (e.g., community destruction, displacement, food security) rather than economic damage caused by climate change. Four diplomats perceive a systemic change (weakening) of the natural resource base for human development, and two non-state representatives speak in more general systemic terms about the nature of climate change impacts, for instance, "multiple repercussions" that are "harder to detect," "hysteresis" and the possibility of moving into a new, incomprehensible state. Only two diplomats associate their home country with the notion of climate change impacts; the majority thinks of people and impacts elsewhere in the world. Nobody mentions identity-related costs, and only four CAMs feature existential threats related to climate change: the possibility of (individual) deaths and the threat to the human species or civilizations by impacts beyond the limits of adaptation. Two diplomats introduce a new category of mental costs: dramatic climate impacts like the loss of island states could have mental effects on people everywhere, and caring about future generations even beyond our grandchildren—a long-term perspective—is important for the mental health of a society. All members of Group 5-MELV express concerns about the economic costs of

climate action especially as an obstacle to an international agreement, and all favor a market-based approach for developing solutions: bringing down the cost of technology, finding the most efficient way to mitigate, or creating the right incentives for market actors. However, three people believe that cost-benefit analysis is a reductionist tool that is not sufficient to prepare decisions, especially at the global level.

As in other groups, concepts related to the benefits of action are poorly developed. Only two people explicitly named "Fixing the climate problem," "Green growth and jobs," and the savings from changed consumption patterns as benefits of action. A third cautions about the potentially immense costs of inaction.

Identity and group membership concepts are fairly limited. Only two individuals use the classic distinction between developed and developing countries, but eight people refer to specific countries or country blocks, especially the US, China and the EU. Two individuals identify the private sector as an important actor or at least partner.

I identified four distinct norms in the CAMs of this group. Three individuals believe that everyone (i.e., all countries in the UNFCCC) should take a fair share of the cost burden based on their respective capabilities. Five people argue that "Countries better off" or "Major emitters" need to take a larger responsibility and/or move first. Third, two diplomats emphasize a moral obligation towards future generations, because "we extend our presence in the world" or we should "leave behind a reasonably habitable planet" and simply have a human responsibility to care for other human beings. Finally, one person emphasizes the responsibility of all individuals to do what they can in their respective position of authority to act on climate change.

Six individuals think about the link between domestic and international politics; four of them point specifically to the case of the US. Five emphasize the challenges of garnering public support for climate action in democracies, and the role of civil society to create acceptance for political change.

Concepts regarding special characteristics of climate change show fewer patterns. Nine group members mention different expressions of complexity and the respective challenges of decision-makers and the public to fully comprehend the climate challenge. The three NGO representatives have a fairly advanced understanding of complexity, including concepts like hysteresis and tipping points. Four people speak about the ways in which climate policies (not climate impacts) affect "all of us," "the entire economy" (pervasiveness), and four people have specific concerns regarding uncertainties surrounding climate impacts, for example, "We don't know how much warming we can live with." Six people mention tipping points; most of them associate the concept with the notion of irreversibility.

The most interesting feature of Group 5-MELV is the fact that all ten group members experience a sense of urgency and emphasize the importance of long-term thinking in developing solutions. Their perceptions of urgency, expressed in time-related concepts like "acute," "lack of urgency," "2030 is practically tomorrow," and "race against time," is particularly surprising, given that most of these individuals live in highly developed countries, far from the vulnerable places of the world that already experience impacts. Equally interesting is their ability to think about the long-term, expressed in phrases like "impacts on generations to come," "the future beyond grandchildren," "build for the future - 50-100 years."

Five individuals consider democracy to be an institution that presents obstacles to climate negotiations because of the need for public support for costly policy measures, the influence of vested interests and the mismatch between problem time scales and political cycles.

Four people express completely different views on the topic of intentionality and blame. One suggests that the rich are imposing the costs of their development on the poor, implying that there are consciously acting perpetrators of injustice. At the other end of the spectrum is the view that there is no enemy to be blamed; rather humans are waging war with the planet. Between these positions are diverging opinions about the concept of historical responsibility.

This group does not show a clear pattern regarding agency concepts and models of change. Group members locate agency in very different places, for instance, in the bilateral relationship between (the presidents of) the US and China, in "the public" that needs to pressure governments, in "the private sector" and its innovative potential, and finally in governments that make collective decisions about mitigation in the UNFCCC. NGO representatives all emphasize the role of individuals in creating change: their mobilization through community-specific framing, the creation of awareness and political will, and everyone taking responsibility and demonstrating leadership, regardless of their position.

b. Narrative

The narratives of most group members are variants of narratives identified in previous groups.

National Interests Trump Collective Ones: Three individuals in Group 5-MELV use this narrative. One person argues that climate change can only be addressed with a bilateral agreement between the US and China, and that they would solve it if it was cheap. Since political will is a function of the price of clean technology, the focus has to be on reducing the

costs of mitigation technology with the use of market forces. The other two individuals confirm the relevance of the costs of burden-sharing, vested interests at the domestic level, especially in the US, and the challenges of motivating people to change and to support climate policies.

The national interest narrative has a strong overlap with *The Market*, which is shared by a member of Group 5-MELV, who emphasizes that action on climate change in the industrialized economies makes economic sense because of conservation-related savings.

Policy-driven System Transformation: One person adds a bilateral dimension to this narrative, suggesting that while climate change is a complex and multifaceted management challenge, a mitigation agreement between the US and China would unlock the global negotiations. Another person shares the view that *Western Voters Have the Power* to change international climate politics by pressuring their national governments. The beliefs of a third individual align with the *Multilateral Solidarity* narrative. A fourth person sees climate change as part of a larger sustainability challenge (*The Larger Picture: Sustainability*), arguing that humanity's collective actions might be damaging spaceship Earth irreversibly. Private sector driven innovation is necessary to create a global energy transition that will leave the planet in a habitable state for future generations.

6. Group 6 – Low Emitters With Low Vulnerability

This group includes Barbados, Cape Verde and Iceland.

a. Content Analysis

All members of Group 6-LELV express a profound concern about the disappearance of island states as a consequence of sea-level rise. One individual described the impacts of unabated climate change in even more stark terms as "the end of history" and the "death of cultures." Identity-related concepts play a much bigger role than in other groups—existence as the condition for identity, land loss, and the loss of iconic landscape elements that represent "what we stand for" are all expressions of a concern that is qualitatively different than anticipated economic losses (which all group members also mention). There is a strong focus on human suffering and social costs (e.g., "human costs," "the poor today will be even poorer," "human suffering," "killing people," "directly affects human lives"). All group members point to national economic interests as the key obstacles to a negotiated agreement (e.g., "cold-hearted business interests," "entrenched economic interests," "politicians defending prosperity"). In two cases this issue is connected to "powerful lobbies" in "powerful countries."

Three identity groups are relevant for these three diplomats apart from their national identity: humanity, the group of major emitters, and the poor and vulnerable people in the world.

All three individuals share one fundamental norm that is in its pure formulation unrelated to climate change: there is a human responsibility to care for other humans if they are suffering. Failing to do so is a moral tragedy, and in the case of climate change this would be a failure of historic proportions. Our shared humanity is the foundation of solidarity.

All three believe that national circumstances matter in this two-level game, either because domestic oil lobbies prevent more ambitious negotiation positions or because national publics need to be mobilized to enable climate action in a state-based governance system.

The complexity of climate change does not receive any attention, but the members of Group 6-LELV share a sense of urgency and a specific timeline: they all believe that global GHG emissions need to peak latest in 2017, and that the Durban Platform timeline (a treaty coming into effect in 2020) is neglecting this timeline. Two individuals include tipping points in their beliefs, either as reason for concern or as something that could help mobilize the public. Tipping points are both dreaded and needed.

For all group members, governments, especially those in the group of high emitters, play a central role in solving the climate problem. They have the power/capacity to act, and their refusal or reluctance to do so can be explained, for example, by the role of vested interest groups, but is not morally justifiable. Some group members are more optimistic than others about the role of negotiation groups like AOSIS or the LDCs to pressure the major emitters into action, and all understand that domestic politics and public opinion are important to unlock the negotiations.

b. Narrative

This group offers emotionally charged versions of narratives identified in previous groups.

Two individuals present emotionally intensified variations of the narrative ***Domestic Interests Trump Collective Ones***. In one person's view, climate change imposes severe human suffering and economic damage. Many countries have not yet recognized that inaction is a costly policy choice. A number of powerful countries have the resources and are the only ones who can solve this problem, but they are reluctant to do so because they have entrenched eco-

conomic interests to maintain the status quo. The small island states are pressuring these reluctant players to act in accordance with their human responsibility to alleviate human suffering. Another person emphasizes the moral tragedy of “discarding parts of humanity” for national economic interests. The rich are developing to the detriment of others; they are killing people, countries and cultures by not doing what is morally expected and right: to help the poor. Denying some countries the right of existence is not something human beings would do.

Finally, one person shares the *Western Voters have the Power* narrative with participants in other groups: Governance is state-based and since the negotiations are constrained by negotiation mandates, the solution has to be sought at the domestic level, where we have to mobilize publics for a change in lifestyles, and a paradigm shift away from connecting carbon with prosperity.

7. Content and Narrative Summary

The following two tables summarize key themes of the CAM content analysis. Table 3-4 offers a summary of the conceptual substance of all 55 CAMs. Each participant group is presented in one column, and each row contains frequently used concepts in each participant group that relate to a particular theory-driven concept category like costs, two-level game, identity or complexity. The concept category “costs,” which is important in rationalist approaches, was divided into climate impact-related costs in the first row and climate action- or policy-related costs in the second row. Regarding the latter, a number of CAMs in participant Group 1-HEHV (column one) contained concepts that could be summarized as “economic costs of action for emerging economies and the US.” There is no row for concepts related to “benefits” because very few CAMs contained concepts that fit this category. The concept category “identity” (row five) lists all identity groups that were mentioned by the participants in the different groups. For example, the members of Group 3-LEHV frequently referred to the developed countries, emerging economies, the human community, the global rich, and the vulnerable. Unlike Group 4-HELV they did not mention particular negotiation groups like AOSIS or the Annex-1 countries. The fact that a concept is listed does not imply that every single group participant has used it. If a box is empty, like in the case of Group 6-LELV and the concept category “Global Power Structure,” the CAMs in that group either did not contain any concepts relevant for that concept category or there was no recognizable pattern among the concepts used.

Table 3-4: CAM Content Summary

	<i>Group 1-HEHV</i>	<i>Group 2-MEHV</i>	<i>Group 3-LEHV</i>	<i>Group 4-HELV</i>	<i>Group 5-MELV</i>	<i>Group 6-LELV</i>
Costs (Impacts)	Existential threat to individuals elsewhere Identity loss today Human suffering at home today Economic and development costs at home today and later Human suffering elsewhere	Human suffering at home today Environmental damage = economic damage Extreme weather events at home today Risks to humanity and life on Earth Loss of countries	Existential threat to my country (later) and individuals (today) Present threats to my identity Human suffering Extreme weather events Environmental damage = economic damage Food insecurity	Existential threat for others later Human security and possibly war later Global food shortage later Extreme weather, environmental change and economic loss elsewhere	Suffering of poor and vulnerable people elsewhere Global systemic changes Mental costs of losing states Existential threats (individuals and civilization)	Existential threat to other states Identity threat at home Human suffering Economic losses
Costs (Action)	Economic costs of action for emerging economies and the US	Costs of mitigation for others Contradict national and big business interests	Costs of mitigation for others	Economic costs of action at home Market-based approaches Technology	Economic costs of action at home Market-based approaches	Economic costs in other countries = obstacles
Global Power Structure	Global Competitiveness Global power management (US concern about relative decline) National interests = obstacles	Power differences and seeking change vs. protecting the status quo National interests = obstacles	Competitiveness (Mitigation raises the cost of doing business) Global power shift Vested interests	Global competitiveness Trade-offs between today and the future Global power game	Global power structure	
Two-level Game	US is holding negotiations hostage	Domestic Constraints, especially US Role of voters US is blocking negotiations	Domestic constraints, especially US Democracies do not accept economic costs Vested interests	Domestic constraints Lack of public support Vested interests	Domestic constraints, especially US Lack of public support Democracies = obstacles	Powerful lobbies in powerful countries National publics need to be mobilized

Identity	<p>National identity (place-based), evolving away from purely developing country (“Moral Dilemma”)</p> <p>Developed vs. developing vs. emerging countries,</p> <p>The most vulnerable and most affected elsewhere</p> <p>The West</p> <p>Community of states</p> <p>Young people/the future</p>	<p>National/ identity</p> <p>Developed vs. developing (=victims) vs. emerging countries,</p> <p>Humanity/planet</p> <p>The international system</p> <p>The vulnerable/poor vs. the rich in the world</p> <p>Generations</p>	<p>Developed countries</p> <p>Emerging economies</p> <p>Human community/global family</p> <p>The global rich</p> <p>The vulnerable</p>	<p>National identity</p> <p>Developed vs. developing countries (unproductive)</p> <p>Annex 1 vs. non-Annex 1 (unproductive)</p> <p>BASIC, AOSIS</p> <p>Individual big emitters</p> <p>Community of states</p>	<p>US, EU, China</p> <p>Private sector</p> <p>Individuals</p>	<p>National identity</p> <p>Major emitters</p> <p>The poor and vulnerable</p>
Norms, Justice & Ideas	<p>Multilateralism and inclusiveness</p> <p>Polluter pays principle</p> <p>Pro-poor, pro-vulnerable regime</p> <p>Climate justice</p> <p>Wrong development model</p> <p>Local and community values</p>	<p>Multilateralism and inclusiveness,</p> <p>Equity</p> <p>Everybody should contribute, depending on ability/historical responsibility</p> <p>Solidarity</p> <p>Connectedness</p> <p>Resource flows from North to South</p> <p>Wrong development model</p> <p>Politics of Wellbeing</p>	<p>Everyone should contribute/inaction is moral failure</p> <p>Ethics should trump profits</p> <p>Solidarity</p> <p>Protection of the weakest/ Equity favoring the poor</p> <p>Alleviate suffering is moral necessity</p> <p>Resource flows from North to South</p>	<p>Fairness</p> <p>Moral responsibility to those less fortunate than us</p> <p>Individual responsibility to other human beings</p> <p>Reduce global consumption</p> <p>Old development paradigm</p>	<p>Everyone should take a fair share of the cost burden</p> <p>Wealthier countries should do more</p> <p>Human responsibility to other humans</p> <p>Moral obligations to other generations</p>	<p>Everybody should care (states)</p> <p>The rich help the poor</p> <p>Solidarity and shared humanity</p> <p>Human responsibility to other humans if they are suffering</p>
Complexity	<p>Systemic time lags</p> <p>Tipping points</p>	<p>Interconnected planetary system</p> <p>Pervasiveness</p>	<p>Pervasiveness</p> <p>Uncertainty as a reason to act</p>	<p>Pervasiveness</p> <p>Uncertainty</p>	<p>Complexity</p> <p>Hysteresis</p> <p>Tipping points and</p>	

					irreversibility Pervasiveness Uncertainty	
Timeline			Urgency	Uncertain 2020 ADP	Urgency	Urgency 2017 Emissions peak
Agency/ Change	National govern- ments Multilateral coopera- tion Domestic action	National govern- ments Multilateral coop- eration Limitations of gov- ernments – need voter support Non-state actor in- volvement at the UN Changing mindsets of consumers	National govern- ments Special role of the emerging powers Limitations of gov- ernments within the UN – need voter sup- port Private sector action	National govern- ments Multilateralism Domestic action (legislation) The market Bilateralism Need public support	Different individual countries Role of individuals in creating political will Private sector	National governments Special role of high emitters Negotiation groups Public opinion can unlock the negotia- tions

Table 3-5 shows the distribution of existing narratives among the 55 study participants in the six participant groups. The groups are shown in the original matrix where the columns indicate different GHG emission levels (high, medium, low) and the rows differentiate between high and low vulnerability (e.g., Group 1-HEHV is located in the upper-left corner and Group 6-LELV in the lower-right).

The members of each group offered different narratives—condensed stories that order and give meaning to their various beliefs about global climate change governance—and often similar narratives occurred in more than one group. A narrative was only included when it was shared by at least two individuals in a group. Different colors are used to identify shared narratives across different participant groups. For example, the narrative *National Interests Trump Collective Ones* occurred in Groups 4-HELV, 5-MELV, and 6-LELV. When it was not possible to place shared narratives next to each other, for instance, in the case of *A Lost Cause*, which occurred in Groups 2-MEHV, 3-LEHV, and 4-HELV, I used arrows to emphasize the connection.

The table shows several interesting patterns. First, only Groups 1-HEHV and 4-HELV contain narratives that are specific to the group. This might be an indication of their novelty or their lack of popularity beyond a small group. Five narratives are shared across three different groups, and three narratives across two groups. Given that these narratives cross different levels of emissions and vulnerability, one could hypothesize that these group-defining factors do not determine—at least not by themselves—the beliefs of group members. However, it is rare that members of non-adjacent groups share a narrative. This only holds for *A Lost Cause*.

Table 3-5: Distribution of Narratives Across Participant Groups

	High Emissions	Medium Emissions	Low Emissions
High Vulnerability	• Addressing Historical Grievances	• Addressing Historical Grievances	
	• A New Development Model	• The Helpless Victim	• The Helpless Victim
	• The Global-Local Link	• A Lost Cause	• A Lost Cause
	• Multilateral Solidarity	• Policy-driven System Transformation	• Policy-driven System Transformation
Low Vulnerability	• Multilateral Solidarity	• Policy-driven System Transformation	• Western Voters Have the Power
	• A Lost Cause		• Western Voters have the Power
	• National Interests Trump Collective Ones	• National Interests Trump Collective Ones	• National Interests Trump Collective Ones
	• Utilizing the Market	• Multilateral Solidarity	
	• Agency Diffusion	• Western Voters Have the Power	
	• The Larger Picture: Sustainability	• The Larger Picture: Solidarity	

8. Structural Analysis

Observed structural patterns occur across multiple participant groups, and are much more limited than the content-related findings.

Generally there is a curious disconnect between the concepts related to climate science and all the other areas of the CAM. As I expected a large number of CAMs make multiple and strong connections between science-related concepts and impact-related concepts, for example, increased temperature leading to droughts or sea-level rise leading to the disappearance of island states. Often those links are strengthened (and might have been created) by personal experiences or observation of events the individual attributes to climate change. However, links to other areas of the CAM, for example, to the *Solution* cluster or the *Problem Nature* cluster, are rare. The

only consistent link between these two themes is the temperature target, which is often perceived as being imposed by science.

There is one exception to this missing-links pattern: a small number of participants point to the science, especially to emission data, as a confirmation for the argument that today's problems are the result of a 'bad development model' used by the West and of overconsumption of global resources. In other words, some individuals appropriate scientific information to bolster existing narratives of North-South inequity, colonialism and consequently the responsibility of the developed world to provide resources to the developing countries.

If individuals have a concept 'Tipping Points' it tends to be associated with the *Science* cluster, but not connected to *Solution* or policy-related concepts.

All CAMs contain various concepts for groups, including groups they identify with—usually their own country or the organization they work for—but also other groups like “The Developed Countries” or “The Fossil Fuel Industry.”

Most CAMs of representatives of vulnerable countries make strong connections between concepts related to climate change *Impacts* and the (national) identity cluster.

One can attempt to identify more or less important concepts based on various measures of centrality. The most straightforward is degree centrality, defined as the number of links of a single node.⁶ Given the research question and CAM process used *Climate Change* is naturally a concept node with high degree centrality. The concept was the anchor point for the interviews and I used *Climate Change* as a central hub for the CAM generation process. Therefore the centrality of this concept is neither surprising nor meaningful. On rare occasions the belief system of the interview partner overwhelmed this natural pattern and forced me to place another concept in

⁶ Other measures that require quantitative analysis include closeness centrality and betweenness centrality. The former measures the shortest distances between pairs of nodes; the latter how often a node serves as a bridge along the shortest path between two nodes.

the center of the CAM, for example, *Sustainability*. The *Climate Change* hub in all other CAMs usually has a number of links to concepts that in turn are hubs for sub-themes of the interview. These ‘regional hubs’ in terms of the visual space of a CAM include *Impacts*, *Problem Nature*, *Solution*, and *UNFCCC*. Other well-connected concepts include the person’s home country name and the concept *Me* as part of the identity cluster, *Mitigation* and *North-South Differences* as part of the *Solutions* and *Obstacles* clusters.

Centrality in the sense of having a large number of links is not always an indicator of the importance of a concept. I detected three other reasons for centrality. First, high connectedness is sometimes the result of difficulties to explain a concept or one’s personal interpretation of the concept, which necessitates the use of many associated concepts to communicate the desired meaning. In other words, more contested or more difficult concepts require detailed explanations, and high centrality measures for the entire CAM might indicate high levels of contestation in the negotiations more generally. This explanation applies to concepts like *North-South Divide*, *Divergence of Views*, or *Development Model*. A similar need to use multiple associated concepts to present subtle meaning occurs when individuals use new or extraordinary concepts, or when a concept is in the early stages of establishing itself in the negotiation process. One example for an extraordinary concept is *Thinking about each other as significant partners*. *Loss and Damage* is a case of a young concept that is still in the process of being defined for the context of climate change negotiations. Finally a high number of connections can indicate that a concept is multifaceted and complex. Examples include multiple elements of a solution, or multiple obstacles, or multiple possible impacts of climate change. Often it is unclear how these elements relate to each other and whether they are interdependent or not.

Other possibilities for structural analysis include an assessment of peripheral, yet important concepts, in other words, the absence of needed centrality. However, the number of peripheral

concepts was too large to draw meaningful conclusions from a qualitative analysis. The same is true for an analysis of the dominance or ratio of emotional valences: what characterizes belief systems with a majority of positive, negative, neutral, or ambivalent concepts?

These initial observations only hint at the potential power of a structural CAM analysis, but computationally powerful quantitative analytic tools will be required to exploit this potential.

CHAPTER 4

Cognitive Obstacles to Cooperation in Global Climate Change Negotiations

CAMs can help reveal at least four different types of information about an actor's mind: the content or substance of beliefs regarding a certain issue (i.e., discrete cognitive elements), the type and intensity of emotions associated with these beliefs, the structure of the belief system, (i.e., the relationships between discrete cognitive elements) and what one might call the narrative that provides coherence to this belief system.

Building on the initial analysis of the cognitive content, structure and narratives summarized in the previous chapter, this chapter interprets this information and presents the central arguments of this dissertation. Highlighting specific cognitive patterns, this chapter analyzes to what extent they match the key assumptions of the main theories of IR. Second, it assesses how study participants grapple with the special characteristics of climate change. Since not all of the findings fit easily into the cognitive categories offered by IR theory or the question of unique problem characteristics, I offer some additional thoughts, for example, on the role of science for the thought processes of climate negotiators and on the problem of defining a goal or purpose for the negotiations. Jointly these insights enrich current knowledge about agency in global climate governance.

The sections below address the following themes: (I) rational choice-based decision-making including the costs and benefits of action, power balancing and structural constraints of agency, (II) identity, (III) norms, justice and other ideas, (IV) the use of scientific information, and (V) agency. The concluding section summarizes the key findings and highlights their implications for IR theory, in particular theoretical interactions between rational choice and constructivist ap-

proaches and the need to expand existing theories of agency to account for time (memory and anticipation) and hope in political decision-making and behavior.

I. RATIONAL CHOICE APPROACHES

This section will assess the existence and strength of cognitive patterns that indicate rational choice-based decision frameworks among study participants as well as the relations between these rational patterns and other cognitive elements that do not fall within the narrow definition of rationality prevailing in IR scholarship.

1. Cost-Benefit Analysis 1: A Hierarchy of Cost Categories

The interview transcripts contain a variety of cost concepts, indicating major differences and diversity in the way individuals think about the costs associated with climate change. Apart from a fundamental distinction between the costs of climate change impacts (i.e., the costs of inaction) and the costs of climate action, it is possible to devise a hierarchy and taxonomy of cost categories. Table 4-1 lists these categories, starting with the most threatening. The table also indicates different at-risk groups mentioned by study participants, contains brief descriptions of the nature of the cost, and mentions the participant groups that are most (but not exclusively) concerned about each category.

Table 4-1: Hierarchy of Cost Categories

Cost Category	At Risk Groups	Description	Associated Groups
Existential Threat	Humanity, Cultures, States, Individuals	Climate change could lead to the destruction of the entire group (i.e., wipe out humanity, destroy cultures, e.g., island cultures, lead to the disappearance of states, or the death of individuals).	3-LEHV, 6-LELV, Youth NGOs
Identity Loss	Nations, Cultures, Communities, Individuals	Identity loss can take many forms, e.g., the loss of an occupation (e.g., fishermen becoming farmers), the loss of homes, the loss of ritual sites and other forms of cultural practice, the loss of landscapes, territory, and associated activities and emotions, the loss of seasons and possible experiences, the loss of species central for hunting, diet, experience of nature.	3-LEHV, 6-LELV, Youth NGOs
Human Suffering	Developing world, States, Regions, Communities, Individuals	Human suffering refers to issues like poverty, hunger, hardship, disease, and water scarcity.	1-HEHV, 5-MVLV, 6-LELV
Extreme Weather Events / Link between Environment and Economy	States, Regions, Communities, Cities, Individuals	Extreme weather events include storms, floods, droughts, heat waves, and the associated human, environmental and economic losses, often mediated by the effects on agricultural productivity and infrastructure.	2-MEHV, 3-LEHV
Global Food Shortage	All Humans, Poor States and Communities	This is a unique category in the sense that it is perceived to be a global concern, not linked to a particular place but systemic. However, poor people are expected to suffer more from it.	4-HELV
Economic and Development Costs	States, Regions, Communities	This category refers to the loss of GDP due to the effects of climate change (overlap with extreme weather events), and the reversal of development progress, e.g., migration of fish populations leaving fishing communities and infrastructure stranded, or increasing temperatures decreasing agricultural yield.	1-HEHV, 2-MEHV, 3-LEHV, 6-LELV
Economic Costs of Action	States, Industries, Voters	The financial costs and GDP loss associated with climate policies; also the loss of global competitiveness.	4-HELV, 5-MELV

The literature on risk and risk perceptions provides a very useful contribution to the rational choice model of decision-making, which stipulates the need to compare expected costs and benefits of various action options. Risk perceptions are cognitive processes related to expected harm or costs. Understanding which risks negotiators perceive as serious in turn helps one understand

which anticipated costs of climate change these negotiators take into consideration when making decisions (Slovic and Weber 2002). This literature offers three specific insights related to the hierarchy of costs developed in Table 4-1. These insights concern (i) the distinction between expected costs for oneself and others, (ii) the distinction between present and future costs, and (iii) the quality or severity of the expected costs.

(i) First, it matters whether individuals anticipate *costs for themselves or for others* (Sjöberg 1998; Sjöberg 2000; Lorenzoni et al. 2006; Leiserowitz 2006). Often the cost categories believed to apply to oneself and to others differ significantly, for example, island state representatives experience an existential threat to themselves but see only economic costs for developed countries. While all participants recognize cost categories that affect themselves and other groups, they are naturally more concerned about the former. The groups associated with each cost category in Table 4-1 tend to be those who connect the specific cost with their own group, usually their own country.

The distinction between costs expected for oneself and for others already indicates the close connection between costs concepts and concepts related to identity—if I expect harm to come to a group I associate with, care about or feel protective of, my motivation to act on climate change will be much stronger than if I believe only other groups to be at risk. Taking this argument one step further, individuals who are concerned about personal costs should have a stronger motivation to contribute to costly solutions than those who are not, especially if these are concerns about the person’s survival and wellbeing.

The structure of the CAMs confirms this pattern to some extent. Individuals in Groups 2-MEHV, 3-LEHV and 6-LELV make a number of connections between climate impacts and their own country or other identity-related concepts. They also tend to be more concerned about and demand faster cooperative action than members of Group 4-HELV and 5-MELV, who have only

weak connections between climate impacts and their own country but generally recognize that climate change will strongly affect the poor and vulnerable in developing countries.

(ii) Second, people distinguish between costs expected in the *present and the future*, a distinction that has implications for their sense of urgency. Individuals who have already experienced climate-related damages in their home country and live in anticipation of additional costs every day have a stronger sense of urgency for action than others, who believe that climate impacts will mainly occur in the future. Combining these distinctions between different groups at risk and the time of impact, costs for the person's in-group today have a much stronger motivational potential than costs to other groups in the future. Closely related to the time dimension of costs is the effect of personal experience. According to work in psychology “experientially derived knowledge is often more compelling and more likely to influence behavior than is abstract knowledge” (Epstein 1994, 711). The interview data seem to confirm this finding: individuals who have observed and experienced what they consider climate impacts (e.g., Groups 1-HEHV, 2-MEHV, 3-LEHV, and 6-LELV) tend to have a much stronger sense of urgency than those who only have abstract or scientifically based conceptions of climate-related costs (Nisbett and Ross 1980).

While these distinctions—affiliation with groups at risk and time of impact—are increasingly being made in the literature on risk perceptions and decision-making (Spence, Poortinga, and Pidgeon 2012; Saleh Safi, James Smith, and Liu 2012; Bruneau, Dufour, and Saxe 2012), the hierarchy table suggests that a third dimension is of fundamental importance for understanding differences in beliefs: the quality of the costs expected.

(iii) Table 4-1 highlights that different study participants think about different types of climate-related costs. The interview data suggest that individuals who are concerned about the three most severe cost categories—existential threats, identity loss, and human suffering—tend to use

a normative decision-making and negotiation framework that is based on fundamental questions about right and wrong. Further, these types of cost arouse very strong emotions, for instance, dread, fear, and anger, and are thought so grave that suffering these costs or allowing these impacts to occur appears morally unacceptable. The question is not whether or not these costs have to be avoided, or which costs should be avoided, but *how* they will be avoided. For these individuals, the negotiations are about the right or wrong path of action, rather than the most cost-effective or efficient one. The latter framing focuses on the distribution of costs and benefits and is used by a second group of participants, who care mainly about less severe economic and material costs. Importantly, the cost categories triggering primarily normative reasoning are all related to climate change impacts, while the most important cost category involved in rationalist cost-benefit arguments is related to climate action and policy. This distinction splits the negotiations into participants who think mainly about the negative effects of inaction (Groups 2-MEHV, 3-LEHV, and 6-LELV), and participants who are focused on the negative effects of action (Groups 4-HELV and 5-MELV). Group 1-HEHV is interesting because it occupies the middle ground between the two camps. This observation suggests that fundamentally *different ways of normative thinking* are associated with different cost categories.

The distinction between individuals with a normative, rule-based decision-making framework and those with cognitive patterns focused on material costs bears strong similarities to the distinction made in moral philosophy between deontological and consequentialist reasoning. However, the emotional pattern identified here—strong and intense emotions among normative thinkers (“hot” deontology) and cooler, more subdued consequentialist belief systems—is not congruent with prevailing moral theories, which consider deontology a logic and rationality-based approach and consequentialism a framework that is driven by emotions like fear of pain.

However, the combination of cognitive content and emotion detectable in this data set supports recent and controversial work in social psychology and moral cognitive neuroscience, according to which deontological patterns of moral reasoning are driven by emotions, and consequentialist thinking—while not completely void of affect—is dominated by cognitive processes comparable to calculations (Haidt 2001; Greene 2008). Roeser offers yet another explanation for the observations made by Haidt, Greene and myself. She argues that rather than being unreliable “gut reactions,” ethical emotions and intuitions can be both useful sources and results of ethical reasoning and deliberation (Roeser 2010). Roeser opposes the dual-process theory that distinguishes between a fast, affective cognitive system based on emotional heuristics and intuition (System 1) and a slow deliberative System 2 that uses rational faculties (Kahneman 2011). Instead she defends an integrated view of emotion and cognition and argues that emotions are part of both the fast and the slow cognitive systems: “... we cannot separate the cognitive from the affective aspect. They are two sides of the same coin. ... In the same vein it is futile to ask whether the affective or the cognitive response comes first” (Roeser 2010, 180).

The qualitative data used here are too general to provide any evidence for the direction of the causal arrows (if any) between cognitive content, emotions, and normative reasoning. But it points to a strong interaction between these three cognitive elements. On the other hand, concepts related to ‘mere’ economic and material loss for the in-group are associated with weaker emotions and rationalist reasoning. These insights begin to illuminate how cost-relevant beliefs impact the rest of a person’s belief system, especially the overall motivation to act, the sense of urgency, and the applicable decision-making and negotiation frameworks.

Placing this debate in a broader context of decision-making in social groups and conflict, recent work in other disciplines confirms that a distinction between normative and rationalist thinking is useful. Berns et al. argue that conflict can emerge or escalate because individuals are

not willing to trade off “sacred values, such as those associated with religious or ethnic identity” in return for material benefits (Berns et al. 2012). A value-based logic prevails over a material-consequentialist one. Transferring this argument to the climate change context suggests that small island states are unlikely to be satisfied with financial and technological support for adaptation (although not even that form of support is readily forthcoming) in a situation when the survival of their statehood and cultures is at stake. Ginges and Atran make a similar argument about deontological reasoning of participants in violent conflict, arguing that quantitative indicators of success or perceptions of the efficacy of violence are unimportant in their decision-making about the use of violence (Ginges and Atran 2011). However, these studies focus only on cognitive content, ignoring the question of emotions.

Risk perception theory points to a number of additional factors that shape individual responses to climate change, including controllability (risks perceived to be under one’s control are more acceptable than those controlled by others) and the distinction between natural and man-made risks, the former being more acceptable than the latter (Sjöberg 2000). One could conclude from the CAMs analyzed here that people from developing countries (Groups 2-MEHV, 3-LEHV and 6-LELV) have a much stronger risk perception because they lack any control over risk sources (GHG emissions) and means of mitigation and even have limited control over means of adaptation, which strongly constrains their sense of agency in the face of climate change. Regarding the distinction between man-made and natural risks, there is a difference between Groups 1-HEHV, 2-MEHV, 3-LEHV and 6-LELV, who seem to frame climate change as a man-made risk that has been created by the developed world and increasingly by the emerging economies, and Group 4-HELV and 5-MELV that seem to view climate change more as a natural risk or environmental management problem.

Based on these empirical observations I disagree with Grasso, who argues that “Moral cognitive neuroscience ... indicates that up, close and personal harm triggers deontological moral reasoning, whereas harm originating from impersonal moral violations, like those produced by climate impacts, prompts consequentialist moral reasoning. Accordingly, climate ethics should be based on consequentialist approaches” (Grasso 2012). While the interview data confirm the argument that different types of (expected) harm trigger different normative frameworks of thinking that resemble deontology and consequentialism, the data also suggest that not all individuals involved in the climate negotiations—or even all people around the world—perceive climate change as an impersonal threat produced by nature rather than human beings. Although climate change is seen as a phenomenon of nature, a large number of study participants consider certain human beings—those in the developed world—responsible both for the creation and advance of the threat. The developed world and increasingly the emerging economies are seen as having caused the problem (historical responsibility for GHG emissions) and as refusing to address the problem despite the fact that they alone hold the power to do so because they control all major emission sources. Consequently the behavior of big emitters is morally reproachable and experienced in a very “up, close and personal” way by negotiation participants from less powerful and more vulnerable countries.

The arguments outlined above might invite the conclusion that individuals from wealthy countries simply lack the heightened threat perception, intense emotional response and urgency experienced by their colleagues from the developing world. Further one could conclude that this result is inevitable because it reflects the current science and reality of climate change—the developing countries will be hit harder and sooner than other parts of the world. However, those conclusions would be crude generalizations that ignore two important observations. First, individuals in developed countries also experience serious threat. In their case, threat perceptions are

linked to fundamental societal and individual values that define much of their identity, although they are not place-based: the neoliberal notions of individual freedom and choice, free markets and minimal government intervention, private property and natural resource extraction as a source of prosperity and happiness. Since climate action threatens to some extent all of these values in the way they are currently defined and practiced in the industrialized world, but in particular among conservatives in the United States, the climate issue is indirectly threatening Western identity and elicits a strong defensive response.

Second, there are study participants from developed countries, in particular Groups 4-HELV, 5-MELV and various NGOs, whose cognitive patterns of concern, urgency and normative reasoning resemble closely those of representatives of vulnerable developing states. This phenomenon will become clearer when concepts of identity and norms are added to the analysis (see below). Finally, the general conclusion that different risk perceptions are insurmountable because they reflect the reality of the differing impact of climate change around the world would miss an important point: people's cognitive patterns can change—based on perceptions of a changing environmental reality, personal experience (e.g., Hurricane Sandy at the US east coast in November 2012), or other reasons for increasing emotional intensity (e.g., framing effects).

A final observation concerns the general absence or lack of importance of a set of cost concepts that I expected to find, at least among a subset of study participants: environmental loss or degradation, species extinctions, and irreversible changes to ecosystems and landscapes. With very few exceptions, individuals are not concerned about environmental values and threats to non-human life on Earth. When these categories show up, they are almost always introduced instrumentally: certain species, ecosystems and environmental characteristics are needed for the survival and wellbeing of humans, for example, their ability to grow food. Not even representatives from environmental NGOs showed a concern about the environment for its own sake, driv-

ing home the anthropocentric nature of the UNFCCC negotiations. Climate change is not perceived as an environmental issue; it is an inherently economic and social issue.

2. Cost-Benefit Analysis 2: The Absence of Benefits

In contrast to the breadth of concepts related to the costs of climate change, participants offered only a sparse, vague and not very detailed set of concepts about the benefits of climate policy. Examples include “to prevent catastrophic climate impacts,” “to avoid dangerous climate change,” and “green jobs.” It is possible that climate negotiators implicitly define the avoidance of climate-related costs as benefits of climate action, but they almost never state this definition of benefits explicitly. This absence of concepts about benefits reflects the negotiation reality, where the focus is on the need for mitigation, adaptation, finance and technology support without addressing the expected benefits of any of these actions. If one assumes that decision-makers employ cost-benefit analyses (CBA) to choose a desirable path of action, this imbalance between costs and benefits in the minds of negotiation participants presents a serious problem, because it can skew the rational assessment towards the cost side of the equation.

Some individuals are introducing the idea of co-benefits of climate action, which implies that acting on climate has positive effects on non-climate policy issues, including health, air quality and security. But the move supports the concern that the absence of perceived benefits of climate action is a serious problem for the negotiations. Co-benefits are supposed to fill that gap without offering direct benefits.

3. Cost-Benefit Analysis 3: the Absence of Numbers

Presumably estimates of future costs and benefits have to be quantified for the purpose of a CBA in order to make different policy-options comparable with each other, for example to an-

swer the question how much agricultural production loss does one avoid by investing \$X in mitigation compared to the benefits of providing the same amount of money as climate finance for adaptation. But with the exception of occasionally mentioned average GDP losses associated with extreme weather events not a single study participant used numbers to estimate expected costs or benefits of different types of climate action, or different aspects of an international agreement. It is understandably difficult to quantify various expected costs, including lost lives, species extinctions and water shortages, or to find other measures that make these qualitatively different issues comparable. The interviews and CAMs confirm this simple insight, challenging rational choice theorists, who assume that cost-benefit calculations are at the core of all policy decisions.

In addition, a small number of participants (mainly in Group 5-MELV) recognize that CBA has severe limitations when it comes to climate change. They argue that CBA has very specific areas of application, including national policy-making and implementation, but is not useful on its own to determine a country's national interest or shape its negotiation position. Other considerations, including reputational concerns, norms and values, play a role that CBA is not able to capture.

Nevertheless I would argue that individuals attempt to make rational decisions in the sense that they compare and weigh the likely but highly generalized consequences of different paths of action to the best of their knowledge and ability. In Groups 4-HELV and 5-MELV this often results in a general concern about the unspecified loss of international competitiveness related to mitigation policies and the associated political costs. Individuals from developing countries tend to think in terms of increasing poverty, loss of agricultural yields and water shortage; usually without attaching numbers, regions or specific communities to these beliefs. Lacking any reliable numbers they resort to very rough qualitative comparisons, which suggests that the cost catego-

ries outlined above might be an important factor in climate policy decision-making. However, even this generalized and numberless version of rationality seems to reach its limits when people consider threats to humanity or to the international community, or the circumstance that sea-level rise will deprive a number of island states of the territory on which their statehood rests. The disappearance of states troubles people in a way that cannot be usefully expressed in numbers.

4. Cost-Benefit Analysis 4: Who uses it?

Every study participant made reference to the idea of national interests and to the relevance of cost concerns related to climate action in the developed world. While people seemed to intuitively understand and use the idea of cost-benefit analysis, one needs to distinguish between those who apply this framework to their own situation, in other words, try to assess costs and benefits for their own group, those who try to use the CBA framework to mobilize action (e.g., the co-benefit reframing attempts), and a third group of people who consider it a bad or unproductive way of looking at the world used by a certain set of countries. Members of this last group often suggest that national interests are major obstacles in the negotiations, or are immoral.

5. Global Power Structures

Members of all six participant groups use concepts that describe global power structures and their relevance for the negotiations. They make three distinct arguments. One concerns the economic interests of individual states, one is about the interests of vested interest groups at the domestic level, and one is about the relationship between two groups of countries: the developed world and the emerging economies.

First, some members of Groups 1-HEHV, 3-LEHV, 4-HELV, and 5-MELV believe that states' concerns about competitiveness (presumably at the international level) are a major driver

of the negotiation dynamics. They never elaborate on the concept, but it implies that climate action imposes unequal costs on participants in international economic transactions, and that expected disadvantages for a country's industries, sectors or firms in comparison to those in other countries would lead to a loss of competitiveness and consequently economic damage, including a reduction in GDP, maybe jobs and taxable income. Most participants believe that these expected costs are the main reason why developed and emerging countries are not willing to act decisively on climate change. This argument is associated with trade-offs between today and the future, carbon leakage, the current structure of major economies, the energy-efficiency of current industries, stranded assets, and the idea of keeping a level playing field for all global economic players, implicitly but strongly linking the climate issue to global economic governance. In a broader sense this is a system level argument concerning the current balance of economic power in the international trade system.

Second, some participants, especially in Groups 3-LEHV, 4-HELV and 6-LELV, argue that vested interests—oil, coal and gas lobbies in particular countries—play an important role because they have large amounts of financial resources and access to the political system. Presumably they use their money and connections to prevent domestic climate action, indirectly hampering progress in the international negotiations. While the competitiveness argument outlined above suggests that climate policy might be desirable and possible if a level economic playing field can be maintained, vested interests are believed to oppose any kind of change. They seek to preserve the status quo in order to protect their own profitability and expected income flows in a business-as-usual future.

Third, some participants believe that the world is currently undergoing a major power transition with economic power shifting from the developed world to the emerging economies. This presents a significant constraint for the climate negotiations because it exacerbates the competi-

tiveness concerns of both of these groups. The developed countries, who already see their power wane, are not interested in speeding up this power loss by imposing costs and constraints on their own economies while other big emitters do not face similar constraints. The most negative interpretation even suggests that the rich have no interest in fighting climate change because climate impacts will limit or roll back the progress made elsewhere in the world. The emerging economies are not interested in curbing emissions at a point in time when they are finally catching up with the developed world and rely on growth to maintain social stability at home. Based on this argument, climate politics is an instrument of power politics—managing systemic changes that are perceived as threats or opportunities by different state actors.

6. The Two-Level Game

Every participant group acknowledges the relevance of cross-scale linkages and the influence of domestic politics in the global climate change governance system. The interviews present strong evidence that the case of the US has brought this issue into focus. General arguments about domestic politics, for example, lack of public support, role of vested interests, political institutions and ideologies, are almost always connected to the US, where there is only weak public support for climate policy, Congress continues to oppose climate legislation or an international treaty, vested interests are strong and have significant influence in the political system, and a conservative ideology has led to widespread climate denial and skepticism. The unique role of the US in the climate negotiations—its massive mitigation potential, its leadership legacy regarding global public goods, and its identity ties to capitalism, unbounded material success and excessive consumerism—has focused every mind on the problem raised by Robert Putnam in 1988: the two-level game. “When national leaders must win ratification (formal or informal) from their constituents for an international agreement, their negotiating behavior reflects the simultaneous

imperatives of both a domestic political game and an international game.” (Putnam 1988). The attention paid to the domestic processes in the US, and how they relate to the UNFCCC, is unique—there are no comparable thought patterns related to any other country. Nearly everyone is aware of the fact that US is not able to make serious international mitigation commitments because Congress would simply not ratify such an agreement—a lesson learned from the fate of the Kyoto Protocol.

One could argue that this is a case of regime failure without the hegemon—that the climate case demonstrates the necessity for the leading, regime-supporting role of the predominant, most powerful actor—the US in the view of most negotiators. Falkner showed that it is not always necessary for the hegemon to support a regime-building effort, coercing and incentivizing others into a new set of behaviors, and that regimes can even succeed against the will of the hegemon (Falkner 2006). But in the case of climate change the problem structure is such that an unwilling hegemon is a serious obstacle, because the global public good cannot be provided without it. At least that is the dominant perception among negotiators, reinforced by the Chinese position that the US has to act first. This situation influences every party’s concerns about regime effectiveness and ultimately deters them from making their own commitments.

While most people consider the US domestic situation a severe constraint for the negotiations, even “holding the negotiations hostage,” some consider the two-level game insight helpful, identifying barriers to success that can be addressed, although not within the scope of the negotiations. Some participants propose strategies to address this barrier, for example, mobilizing the public in the US, and working with civil society and the media to devise and spread appropriate messages at the grassroots level. Refocusing on the role of voters, these individuals believe that pressure from below can counter vested interests and create the political will for climate legislation. Recognizing that the enabling conditions for an international agreement cannot be created at

the level of political elites, these ideas create new solution space outside the negotiations with positive and negative implications for agency.

Some participants seem to go even one step further, suggesting that specific national institutions—democracy and short election cycles—pose challenges to the climate negotiations because they reinforce and institutionalize short-term thinking and political incentives. This raises the intriguing question whether democracy is a regime-type that is unfit for global governance in the Anthropocene.

7. Realism's Eternal Wisdom?

The observed cognitive patterns—a focus on the costs of action, major differences in the expected types of costs for different actors and their timing—interact with and seem to mirror the current material circumstances and scientific information about climate change. Each concept and belief is a reflection and interpretation of reality as the individual perceives it.

Historically the developed world has been and continues to be the main contributor to climate change. The expected impacts of climate change will disproportionately disadvantage the developing world—poor and vulnerable countries with limited resources to adapt to change. These negative impacts are an unintended consequence of economic activity in the industrialized countries. Only the latter have the power to address the problem; they could control the emission sources and have the resources that could help the poor deal with the changes to come. Addressing the problem requires at a minimum the costly transformation of current economic structures, phasing out fossil fuels from all production and consumption processes. This would include a teardown of some of the most profitable industries on the planet, but would affect all sectors of the economy. Power—the capacity to address climate change—is unevenly distributed in the world; it is concentrated in the global North, and currently expanding to the emerging econo-

mies. The powerful actors' current perceptions of their material-economic interests—preserving economic power and protecting profit-making industries—do not favor climate action, because mitigation implies economic costs that are not outweighed by identifiable benefits. Consequently no action is taken to slow climate change, committing the developed world to increasingly certain damages and suffering.

In short, the distribution of power and threat perceptions over the last two decades has resulted in political behavior that confirms the expectations of neorealist theory. The powerful act in their self-interest to the detriment of the powerless. Interestingly all study participants—men and women alike—share an understanding of this realist explanation of the climate change negotiation stalemate, but they differ in their beliefs regarding the inevitability of this outcome. Those differences will become clearer when analyzing notions of identity, norms, and models of change below (see sections II, III and VII).

II. IDENTITY

Not a single CAM can do without basic identity concepts that identify and distinguish existing actors and groups, and attach roles, characteristics, intentions, and other meanings to them. Identity groups are basic building blocks of belief systems—they determine the available agents one can associate with, seek to protect, assign blame or responsibility to, fight, fear or feel for. Identity concepts enable thinking about agency, group relationships and norms. They are also preconditions for rational choice thinking, because assessing costs and benefits is impossible without knowing who will incur them. Rational cognitive patterns depend on identity—the existence of me and you, us and them, in-groups and out-groups (Tajfel 1982; Risse et al. 1999; Kaarbo 2003; Abdelal et al. 2006).

1. Identity Diversity - More than the State or Nation

IR theory's natural starting point for thinking about identity is the state or the nation (Hall 1999; Risse et al. 1999; Kaarbo 2003). But the interview transcripts demonstrate that the national identity is rarely the only category, and sometimes not even the most important one in the minds of negotiators. The following identity groups are the most common among study participants: developed and developing countries, emerging economies (BASIC), big emitters, negotiation alliances (e.g., AOSIS, LDCs), the vulnerable or poor in the developing world, humanity or human civilizations, the planet as a systems of humans and ecosystems, oil lobbies, civil society, and individuals.

These groups can be clustered around three themes. First, there are groups that use the state as the basic unit of membership. This includes groups of countries (e.g., developed countries), process-specific groups of countries (e.g., negotiation alliances), or issue specific groups of countries (e.g., big emitters). Second, some groups use certain characteristics of its members—individual human beings—to define the collective's boundaries. These groups tend to be larger than a state and include the poor, the vulnerable, and humanity. Finally there are groups associated with domestic or local politics, including lobby groups, civil society organizations or individuals.

Table 4-2: Identity Groups

Identity Group	Participant Group*
National Identity / The State	1-HEHV, 2-MEHV, 4-HELV, 5-MELV
Developed vs. Developing Countries Emerging Economies	1-HEHV, 2-MEHV, 3-LEHV, 4-HELV
Big Emitters	4-HELV, 5-MELV, 6-LELV
Humanity / Planet Earth	2-MEHV, 3-LEHV, 6-LELV
The Vulnerable / The Poor	2-MEHV, 6-LELV
Lobby Groups, Civil Society, Individuals	All

* Not all members of a group listed mention this identity group; only some do.

Truly extraordinary is the identification of planet Earth as an interconnected system of humans and all other life as a unit one can identify with and seek to protect. Short of thinking about other civilizations in the universe, this is the ultimate, all-encompassing in-group, extending the boundaries of what is worth protecting even beyond humanity, animal and plant life to the systemic functions of the planet.

Some of these categories present a troubling puzzle for international relations. The modern international system and those who study it only acknowledge states as actors with formal rights and obligations. States have sovereignty-based rights to represent a group of people (citizens), to enter agreements with each other and create international regimes (Keohane 1984; Koremenos, Lipson, and Snidal 2003), to conduct diplomacy, to appoint officials of international organizations, and to be subject to rules that govern war (Held 1995, 78). While this system also acknowledges the existence and maybe even influence of other actors, including non-governmental organizations, transnational networks (Keck and Sikkink 1998) and private sector organizations (Keohane and Nye 1977; Strange 1996), it does not award these non-state actors any rights or obligations beyond those they are given by the states in which they originate. Given this background the frequent reference to non-state actors, especially by diplomats, deserves attention. These references are unproblematic when they merely describe current or desirable behavior by non-state actors, who are considered to play a certain role in the larger context of climate change governance. However, beliefs that attribute rights and obligations to humanity, ‘the wealthy,’ or ‘the vulnerable’ are deeply problematic to the extent that they imply a fundamental mismatch between the actor categories accepted in the current international system and the actor categories necessary to deal with the climate problem—they pose an ontological challenge in the sense that they introduce entities with rights and obligations that do not (yet) exist in this form in international politics. Nobody is able or entitled to represent humanity or the poor in the international

system—these entities are non-existent as far as the institutions of world politics are concerned. Appeals to these identity groups are bound to be ineffective, yet participants in the climate negotiations (not only by study participants) put them forward, and assign these groups rights and obligations that appear to be rooted in cosmopolitan notions of mutual responsibility based on shared humanity.

How can one understand these cognitive patterns? One could argue that powerless states invoke the protection of humanity and associated moral obligations for purely instrumental reasons—moral persuasion is the only form of power they can wield given their lack of material power or mitigation potential. But in many cases it is equally plausible that the climate problem is simply incomprehensible without reference to humanity as a whole—the concept creates emotional coherence in response to conceptual novelties regarding the global climate system and complex, uncertain, long-term consequences. Once a person discovers the interconnectedness of all human beings through the global climate system, it becomes easier or even imperative to believe that the broader collective interest of all ought to trump the narrow national ones of a few. People who share this belief are also more likely to question the adequacy of the current international system to address climate change. Rather than ‘misunderstanding’ the basic rules of the system or being hopeless moral optimists, they have acquired beliefs that are incomprehensible with the reality of the UN process, and they begin to challenge it in order to reestablish cognitive coherence.

Similar to the rationalist cognitive patterns, there is no discernible difference between men and women or diplomats and NGO representatives when it comes to cognitive patterns related to identity.

2. Underestimated: Place-Based Identity

A very interesting identity dimension that receives increasing attention outside the field of IR (Adger et al. 2011; Fresque-Baxter and Armitage 2012) is place identity. It is defined as “those dimensions of the self that define an individual’s personal identity in relation to the physical environment by means of a complex pattern of conscious and unconscious ideas, beliefs, preferences, feelings, values, goals and behavioral tendencies” (Proshansky 1978, 155), and has numerous dimensions including emotional attachment, continuity, security and social connections (Fresque-Baxter and Armitage 2012). Naturally, place-related identity elements are of major significance for individuals who perceive the physical integrity of their home countries to be at risk from climate change—mainly representatives of small island and low-lying developing states in Groups 3-LEHV and 6-LELV. For these individuals, parts of their identity are existentially threatened—in a few decades particular places might have disappeared under the rising ocean, or unrecognizably altered due to land loss, erosion and coastal flooding. Climate change might destroy places that they call home, where they grew up, where they used to work or met their spouse. Climate change threatens to change the topography of the world in a way that alters their life experience both as individuals and nations, taking away physical realities that link their present lives to their past. The loss includes the possibility for their children and future generations to have a similar life experience, and importantly it involves a broad range of emotions associated with these places, landscapes and the experiences they made possible.

But it is not only islanders who experience threats to and even loss of place-based identity. Study participants in Groups 1-HEHV (youth NGOs) and 4-HELIV express concerns about the loss or change of seasons, for example, the absence of snow in some regions in North America in the 2011/12 winter, the change of local forest expressions, the loss of a way of life, and the sadness and melancholy associated with losing “the world as it always was.” With one exception all

of these individuals are women, who also use or connect the concepts nature and beauty. These identity concepts are not attached to the country, but to lower system scales like a region (state or province), a city, a cultural community, or an ecosystem the person has a relation with or feels connected to.

It is possible that the destabilization of physical-environmental parts of a person's life leads to some form of psychological-emotional destabilization—the world feels less certain, less reliable and less safe. The mental costs of accepting these changes and adjusting to a changing environment, especially in a time period when it is unclear when the changes will end and what the new normal will look like could be immense for individuals with a strong need for stability. In a subtle way these changes threaten what Anthony Giddens calls a person's ontological security—a sense of stability and continuity of the basic constituent elements of life (Giddens 1991, chap. 2).

Societies tend to develop a set of tools or sociological mechanisms to deal with—usually suppress—such disturbing information or signs of impending change (Norgaard 2011; Weintrobe 2012). One would expect that negotiators do not have the same options of socially organized denial, because their profession forces them to confront these destabilizing ideas regularly. Yet, most of the time disturbing information about climate change—in the form of scientific findings or individual accounts—is kept away from the negotiation process. The NGO community tries to introduce these elements into the conversation, but their side events or staged protests are separated from the negotiations; they take place in a different building and negotiators rarely ever attend them. The only group of negotiators that continuously introduces disturbing information about climate impacts and its tragic human consequences, emphasizing the need to devise solutions based on the latest science, is AOSIS (“the voice of conscience”). Small island state repre-

sentatives seek to make other delegates “... “see” connections between their lives and politically relevant events in the world around them.” (Mills 1959; Norgaard 2011, 76)

These cognitive patterns of study participants present examples of individuals, who perceive place-based identity threats to themselves or their in-group, related to places that they consider their own, individually and collectively as citizens of a state. This raises the question whether people could experience similar losses and emotions regarding places that are not their own, for example, the “loss of paradise” for world-traveling Europeans with the disappearance of small island states in the South Pacific, or the “loss of mystery” with the changing Arctic, and associated notions of adventure, courage, uniqueness, beauty and value.

III. NORMS, JUSTICE AND OTHER IDEAS

1. Who Cares about Norms?

Who cares about norms, what are those, and whom do they burden with obligations? With the exception of Group 4-HELV and some representatives of faith and development NGOs, all participant groups integrate normative beliefs into their cognitive structure. Table 4-3 summarizes the set of normative ideas regarding climate change governance contained in the interview data. Most of these are shared across multiple groups.

Table 4-3: Norm Distribution

Norm	Participant Group*
Everyone (i.e., every state) should contribute / care / take a fair share of the burden / based on their capabilities.	1-HEHV, 2-MEHV, 3-LEHV, 5-MELV, 6-LELV
Historical responsibility	2-MEHV
Richer countries should do more.	2-MEHV, 3-LEHV, 5-MELV, 6-LELV
Emerging economies should do more / More integrated mitigation	2-MEHV, 3-LEHV
Polluter Pays Principle	1-HEHV
Solidarity / Protection of the weakest / Pro-poor regime /	1-HEHV, 3-LEHV, 6-LELV

Equity favoring the poor / The Rich help the poor.	
Human responsibility to other human beings	4-HELV, 5-MELV, 6-LELV
Global wealth equalization through resource flows from North to South (equity)	2-MEHV
Multilateralism and Inclusiveness / Procedural Justice	1-HEHV, 2-MEHV
Intergenerational responsibility	2-MEHV, 5MELV
Changing lifestyle patterns in the rich world.	1-HEHV, 2-MEHV, 3-LEHV, 6-LELV

* Not all members of a group listed share this norm; only some do.

Most of these norms do not contradict or exclude each other, at least not in their general formulations used here, which are based on the language used by participants. Only two individuals in Group 2-MEHV support the concept of historical responsibility; individuals in Group 4-HELV considered it unproductive or associated it with negative emotions. Most participants do not even mention the concepts equity and historical responsibility, which seem to be a major source of contention in the climate negotiations. But many believe that fairness and responsibility are important concepts. Finding a productive bridge between these two levels of norms—equity and historical responsibility as a position in the negotiations, and a subjective preference for fairness and responsibility—might be a potentially big opportunity to advance the negotiations.

The idea that every state should contribute to a solution to the best of their ability—even developing states—might not seem surprising, but signals a significant departure from the previously dominant interpretation of one of the core principles of the UNFCCC: common but differentiated responsibilities and respective capabilities (CBDR+RC). In the past this norm has been operationalized through the distinction between developed countries in Annex 1 of the Kyoto Protocol and the group of so-called non-Annex 1 countries. The former group is supposed to take on legally binding mitigation commitments and to provide resources for mitigation and adaptation action in non-Annex 1 countries. The latter do not have legally binding mitigation obligations, but recently have been asked to take Nationally Appropriate Mitigation Actions (NAMAs). Today almost all study participants consider this distinction between Annex 1 and non-Annex 1

countries unproductive and even an obstacle to negotiation success. Returning to the idea that there are common rather than differentiated responsibilities, study participants support the idea that everybody should contribute to a solution. In some CAMs, especially in Group 3-LEHV, this norm is connected to the emerging economies, who are not part of Annex 1, but no longer fit the category developing countries due to their increasing economic success, future emission and mitigation potential, and global political power.

However, the norms presented remain vague and provide no clear guidance for the distribution of responsibilities or burden-sharing arrangements among negotiation parties. They merely suggest every country should contribute in some form, that country's contribution can differ, and that developed countries ("the better-off," "the rich") and in some people's opinion the emerging economies should do more than they are doing now.

Further, linking norm-related concepts to cost and identity concepts is not straightforward. But it is possible to draw some initial conclusions from the combination of the cost hierarchy (Table 4-1, p. 159), identity constructs (Table 4-2, p. 175) and the norms summarized in table 4-3. Members of Groups 3-LEHV and 6-LELV, who perceive present threats to their existence and identity and often use a moral normative framework, express support for norms that invoke humanity and solidarity as reference points. These norms obligate everybody—every state and every human being—to take responsibility for others, especially the vulnerable. Groups 2-MEHV and 5-MELV show a similar pattern of normative thinking, and expand it to a responsibility to future generations. Members of Group 1-HEHV, who are both highly vulnerable to climate impacts but also increasingly significant contributors to global GHG emissions, seem to demonstrate a form of compassionate pragmatism: everyone should contribute to a multilateral solution in favor of the poor, and preferably those who have caused the emissions should be responsible for mitigation (which, as they recognize, will include emerging economies in the fu-

ture). The absence of a clearly identifiable cost-identity-norm pattern for Group 4-HELV is also interesting. It might indicate a fundamentally different cognitive pattern in which norms are not necessary to make sense of the problem, or it could be the result of a cognitive effort to suppress norm-related concepts; at least those used by their colleagues in the negotiations.

2. Do Ideas Matter?

The CAMs developed for this study offer an example for the relevance of a purely ideational construct for an ongoing political process: the argument that solving climate change requires a “new model of development” or “a new aspirational model for the poor.”

Individuals across three different participant groups (1-HEHV, 2-MEHV and 4-HELV) formulated different versions of the same argument: apart from the various technological, economic, legal, and institutional changes discussed in the negotiations, addressing climate change will require a new development paradigm. The demand for a new model of development is often associated with a criticism of current consumption patterns in the world, and the pursuit of economic growth as the ultimate political and social good. However, the argument does not focus on the behaviors, policies, practices or outcomes of development, but on the ideational construct or conceptual model that defines, gives meaning to and justifies what policy-makers today understand as development. A model in the sense used by the study participants is an abstraction—a cognitive structure. While it is non-physical in itself, it is related in multiple ways to a broad range of physical objects, human behaviors, institutions and practices, including patterns of production and consumption, economic growth, professions, industry standards, goods and services, global supply chains, or social relationships. The individuals who argue that we need a different model have identified some of these current physical-material realities of development as problems in the context of climate change. Seeking to permanently change these material realities and

patterns of behavior, for example, the kind and amount of consumption in the developed world or the pursuit of economic growth at the expense of other goals, they suggest that such change requires first of all a change of beliefs, “a change of mind,” presumably by everyone who is involved in the practice of development. Since a broad set of undesirable economic and political behaviors today rest on a model of development that prescribes and validates these existing patterns, and allows for their institutionalization, there is no use in tackling these behaviors without first tackling the ideational foundation that gives rise to them.

The importance of ideas in changing material realities is a feature of Cox’s neo-Gramscian theory of hegemony and acquiescence in the international system, which is enabled by an alignment of ideational, institutional and material power (Cox 1996). In the present international system neoliberalism provides the foundation for the institutional architecture, and justifies the distribution and accumulation of material capabilities and power in certain parts of the system. Demanding a new development paradigm tackles the ideational foundations of the current international system with significant implications for its institutional and material components. Bernstein makes a similar argument about the ideational power of neoliberalism in the context of global environmental governance, and suggests that this particular set of ideas and norms has been so successful because of its socio-evolutionary fitness in the existing social structure and with the actors at the time of its rise (Bernstein 2001, chap. 5).

Regardless of the validity of this argument, designing a new development model and creating the conditions for its broad acceptance and application is not a task that can be accomplished by climate change negotiators. If these individuals have correctly identified a problem and corresponding solution space outside the negotiations, this would have important implications for the UNFCCC process. It might imply that the negotiations are not able to succeed because not all pieces of the puzzle are in the possession of the negotiation parties. Those who make the new-

paradigm argument do not draw this conclusion for the negotiations, nor do they elaborate on its implications for climate or development governance.

IV. THE USE OF SCIENCE

Policy-making in modern societies is based on the general assumption that scientific knowledge is a necessary condition for enlightened decision-making: “we presume that knowledge will lead to rational action” (Norgaard 2009, 12). Making a distinction between science as the pursuit of truth and politics as a struggle between values, many scholars, policy-makers and voters alike assume that there is a rational or logical link between a scientific finding, such as anthropogenic climate change, and the “right” policy response. Hulme calls this model of a science-policy interface “technocracy” (Hulme 2009, 102–103).

Given the nature of climate change as an environmental phenomenon rooted in physical, chemical and biological processes, scientific knowledge should play a major role in the way negotiation participants think about the governance challenge. Science-based concepts should determine or at least influence the general problem definition, possible solution options, the overall goal of climate governance, and maybe even the social and technological challenges to be expected in pursuit of this goal. The IPCC acts as the key source for scientific information in the UNFCCC process. Its task is to aggregate and summarize all relevant scientific information for regime-building purposes without making policy prescriptions. The latter task is for the politically legitimized representatives of states as parties in the negotiation process. In reality this neat separation is nearly impossible as the section on the governance goal (see below) will demonstrate.

The interview data do not confirm these expectations about the relevance and use of climate science. Science does not play a significant role at all in the belief systems of most study participants. Rather than being integrated in the various thought patterns concerning the nature of the problem, solution options and governance goal, climate science is almost cognitively separated—there is a set of concepts that can be activated if one is asked about them, but this belief cluster does not necessarily interact with the thought processes that dominate the negotiation process. Neither scientific concepts in general nor complexity concepts in particular are used to define negotiation positions, solution options or the final goal of climate governance.

The four sections below will address several science-related cognitive patterns that emerge from the CAMs: (i) a general disconnect between the science and the politics, (ii) issues related to defining a goal of climate governance, (iii) the inadequate ability of negotiation participants to grapple with the complex nature of climate change as a natural phenomenon, (iv) and issues related to time. These sections address mainly my second hypothesis regarding cognitive obstacles to multilateral cooperation. They confirm that some but not all complexity-related characteristics of climate change pose particular cognitive challenges for participants in the negotiation process.

1. The Science-Policy Disconnect

All participants share a similar set of ideas about climate science, which concerns the nature of the problem. This belief cluster usually includes the belief that climate change is real, anthropogenic, caused mainly by GHG emissions and land-use change, and has a range of bad consequences. This set of core concepts has become a background truth for all political thinking without making reference to numbers, uncertainties, timelines or other specifics. It is taken for granted, does not seem to require articulation anymore, and appears to be a sufficient basis for debating action. This simplified version of climate change—GHG emissions have bad conse-

quences—is a cognitive framework that provides direction, which most individuals are satisfied with despite not knowing how to define success for the climate regime, how to measure it, what would constitute useful milestones, and what relevant time constraints might exist.

Despite the existence and constant expansion of scientific knowledge, there is only a weak connection between this information and the concepts that reflect the substance of the political debate—what to do, who should do it, when and why. There is one strong link between GHG emissions as a science-related concept and mitigation as a solution-related concept. Beyond that science-related concepts only show strong connections with impact-related concepts, for example, sea level rise and the disappearance of island states, but no other areas of the CAMs. This separation between science and politics becomes even clearer when looking at the reduced versions of the CAMs (Appendix Ch4-1). In almost all core CAMs science-related concepts have been removed, but the maps continue to make perfect sense as long as there are climate impact-related concepts to motivate action.

The disconnect between the political aspects of the negotiations and the available scientific knowledge speaks to a problem that the global governance literature calls regime effectiveness. There are multiple ways to think about regime effectiveness. Oran Young identifies six of these (O. R. Young 1994), but here I am solely concerned with the question of problem solving: will the climate regime have an effect on the climate system, and slow or prevent dangerous climate change in line with Art. 2 UNFCCC. In contrast to the existing literature (Underdal 1992; Mitchell 2006; O. R. Young 2011) my observations concern the stage of regime development rather than a post-hoc assessment of international regime effects. While the regime is in the making, do its creators consider scientific information that is relevant for the effectiveness of future climate governance instruments? In essence this is about a potential mismatch between the scientific problem concepts and the political solution-concepts in the cognitive patterns of climate ne-

gotiators. The structural disconnect between climate science and the rest of the belief systems of study participants impressively shows that the climate negotiations today are all about getting a deal—a political solution—rather than addressing climate change in the way we have come to understand the problem scientifically.

2. The Goal of Climate Governance

A discussion of regime effectiveness raises the question which goal the climate negotiations ought to pursue. What are the parties trying to accomplish through the climate negotiations? What is the purpose of a climate regime? While this seems to be a simple question, and a necessary starting point for thinking about a governance regime, the interview data show that most study participants do not have a clear answer to it. Instead there seem to be three counterproductive, interlinked cognitive patterns regarding the goal of climate governance: the absence of clear definition and shared understanding of a goal, the political focus on the 2°C target, and recent pessimism regarding the attainability of the temperature target.

Art. 2 of the UNFCCC states that the purpose of the Convention is to achieve “stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system.” In an attempt to define the term “dangerous climate change,” the parties agreed in the Copenhagen Accord in 2009/2010 that global average warming should be limited to 2°C above pre-industrial levels. In Durban in 2011 the parties acknowledged that it might be desirable to pursue a temperature target of 1.5°C, but they did not make a commitment to do so.

When asked about the goal of climate governance, only two individuals mentioned the Convention objective of avoiding dangerous climate change. Many more referred to the 2°C degree target as the final goal of the negotiations; other responses included ideas like “the decarboniza-

tion of the economy” or simply “global GHG emission reductions.” Participants seemed puzzled when I inquired why decarbonization or a 2°C were desirable goals and in most cases did not offer a rationale for these rather technical goal formulations. The 2°C target seems to have become a goal in itself. The majority of study participants do not think about the goal of climate governance in terms of creating public or social goods, such as the prevention of harm and suffering, the avoidance of economic damage, or the stability and wellbeing of societies. Instead the technical steps towards those higher-level goals have replaced the goals themselves. Hulme confirms this observation and believes that the global temperature target is “socially regressive” by “confusing ends with means” (Hulme in Knopf et al. 2012, 124).

Only six individuals defined goals with strong connections to human wellbeing, but differed significantly in their framing and specificity: “to minimize damage and suffering,” to maintain “a biophysical system supportive of nine billion people in 2050,” “to prevent catastrophic impacts,” “to ensure that we can all survive,” and “the number that prevents war.” These goals were generally not linked directly to the 2°C target. The cognitive pattern of the majority—a focus on the means to an end rather than the end itself—is not trivial and speaks to the major challenges governments face in communicating climate change policy. A global average temperature target does not mean the same to politicians and voters like saving lives and avoiding damage, and therefore does not have the same motivational power. The universal nature of the goal makes it hard to engage human imagination (Hulme in Knopf et al. 2012, 123). Further, the focus on what Hulme calls an “output variable” rather than the various anthropogenic input variables that create global warming adds a significant amount of ambiguity—it is uncertain how the goal can be reached. Maybe even more importantly, the goal is unachievable because it requires a higher level of understanding and control of the climate system than humankind currently has and is likely to achieve in the foreseeable future (Hulme in Knopf et al. 2012, 123)

Many study participants argue that scientists determined this temperature target as the number that would prevent dangerous climate change, and that political actors simply accepted it. In line with this view, the Copenhagen Accord refers to “the scientific view that the increase in global temperature should be below 2°C.” Scientists on the other hand emphasize that the selection of a certain target is a value judgment that has to be made by politicians (IPCC 2001). The literature traces the target back to EU’s political efforts since 1996 to energize and guide the negotiation process (Tol 2007; Randalls 2010). Finally, one can argue that 2°C was a number that appeared scientifically still feasible (in 2009), was likely to avoid massive species extinctions, and based on the Stern Report was not too costly economically—it offered a pragmatic compromise. Regardless which argument is most accurate, they all suggest that the goal was not selected because the negotiation parties had come to a shared understanding of what constitutes dangerous climate change. Taking this argument one step further, Barrett and Dannenberg argue that parties knowingly set a target that is too weak to prevent catastrophe, pledge less than what is needed to reach their target, and most likely will do less than is necessary to fulfill their pledges (Barrett and Dannenberg 2012).

Even more serious than the disconnect between climate science on the one hand and the current goal definition on the other is the fact that in 2012 most study participants no longer believed that the 2°C goal will be achieved. Many argued that based on the science it is still technically possible and desirable to keep warming below 2°C, but that it is politically impossible to get there. If these individuals had previously accepted the 2°C mark as a boundary between safe and dangerous levels of warming, they must conclude that we are heading towards a world with dangerous levels of climate change. However, these individuals do not despair and do not expect catastrophe despite believing that the target will not be met. They even remain confident and hopeful that the climate problem will be solved. The parallel existence of hope and a belief in

failure (to prevent dangerous climate change) is curious. It suggests that these individuals do not associate the idea of missing the target with impending catastrophe—things will get worse, but they are not (yet) hopeless. This thought pattern is confirmed by concepts like “Some action is better than no action,” “Small wins are possible,” or “4 degrees is better than 6 degrees.” These belief systems do not merely distinguish between a benign ‘less-than-2°C future’ and a catastrophic ‘more-than-2°C future,’ but contain a spectrum of outcomes, where 2°C warming is better than 3°C, but 5°C is also better than 8°C. In other words these individuals do not perceive of the temperature target as a tipping point between two qualitatively different worlds—a safe one and a dangerous one. Instead negotiators believe that collectively humanity might be moving towards a dangerous world when surpassing the 2°C target temperature, but not a catastrophic one. Most of them have never considered the idea of catastrophe but they have all considered the possibility of warming beyond 2°C. In fact, it is still entirely unclear what catastrophe means as compared to danger, when or where catastrophe would start and how it can be averted. Given these uncertainties, individuals appear to look for reasons to be hopeful, despite a negative assessment of the political situation and mounting scientific evidence for the severity of the problem.

3. Dealing with Complexity

Underdal to some extent captures the challenges of addressing climate change when he argues that some environmental problems are hard to solve because they are “long-term policy problems with time lags between policy measures . . . and effects,” they “are embedded in very complex systems” surrounded by uncertainties, and “involve global collective goods” not subject to single best effort solutions (Underdal 2010). How do study participants deal with the characteristics of climate change that make it a complex problem, including pervasiveness, non-

linear behavior, time lags, cross-scale interactions, cascading failures, and sometimes irreducible scientific uncertainties?

Study participants in all groups use the term complexity when describing climate change, but not necessarily in the sense that complex systems theory defines complexity. Many have a partial understanding of complex systems characteristics, for example, they recognize that there are multiple interacting causes and effects across social scales, and that climate change is a uniquely pervasive problem that affects all kinds of social and economic behavior. Individuals in Groups 2-MEHV and 3-LEHV, and to a lesser extent 1-HEHV and 6-LELV, are particularly aware of social-ecological system links. They see rain-fed agriculture in developing countries, fishing, and nature-based tourism not only as key income and GDP sources, but as the foundations for livelihoods and ultimately happiness. In these groups the link between nature and economic wellbeing is much more visible and conscious than among representatives of developed countries. Most members of Groups 1-HEHV and 2-MEHV have a planetary systems view that links either all of humanity, or humanity and “all life on Earth.”

Most study participants acknowledge the existence of uncertainties, but none views this fact as an obstacle for the negotiations or as a reason to delay climate action. Most people see uncertainty as a science-related concept that concerns climate change impacts. Some worry that impact uncertainty is a problem for mobilizing publics for climate action. One person outlines how impact uncertainty makes it difficult to create legitimate adaptation budgets and funding requests. Only one participant made a strong case for the precautionary principle based on scientific uncertainty, arguing that our lack of understanding regarding biodiversity and the importance of certain species we might be losing is really disconcerting—we do not even know what we are losing and how important it is for humanity’s wellbeing.

Imperceptibility of climate change is not an issue for most negotiators, because many believe they have observed climate impacts at home. Only three individuals state explicitly that they have not observed any climatic changes. But some participants, especially in Groups 3-LEHV and 4-HELV, recognize that imperceptibility is a problem when it comes to garnering public support for climate action in the developed world. They argue that personally feeling or merely seeing the effects and destruction climate change can bring, for example, in the form of intensifying and more frequent extreme weather events, can change people's minds about the problem. This observation points to the cognitive challenge of dealing with abstract scientific information as the sole motivator for political action in large parts of the developed world, where climate impacts are not yet felt or where changing weather patterns are not yet explicitly connected to climate change. In many countries climate change is still an idea or a concept, but not a reality.

Given the fast-growing scientific interest in thresholds or climatic tipping points over the last four years (Lenton et al. 2008; Scheffer 2009; Scheffer et al. 2009; Lenton 2011b; Dakos et al. 2012), it is surprising that most study participants do not yet have a good understanding of the concept and its potential implications for the negotiations. Many do not mention the concept at all or only when specifically asked about it. When people refer to tipping points at all, they usually do it in the context of science, but rarely in the context of climate impacts and never in the context of the governance goal or policy design. Individuals who have more detailed thoughts about tipping points are primarily concerned about the irreversibility of change associated with them. A small group of people (members of Group 6-LELV and environmental NGOs) believe that tipping points might be useful to mobilize public support—they are both dreaded and needed. Development and industry NGO representatives have the most sophisticated understanding of tipping points, but even in their minds the phenomenon is linked to ecosystem change only, lacking clear connections to social systems. These observations contradict Nuttall, at least

as far the climate negotiations are concerned, who suggests “The tipping point thus becomes tremendously powerful in discursive, rhetorical, and metaphorical senses.” (Nuttall 2012, 97). Agreeing with Young, who argues that one of the cutting edge issues of global environmental governance is an understanding of tipping points and non-linearities (O. R. Young 2011, 19858), I find evidence that the current science-policy interface design of the global climate regime does an inadequate job of creating this understanding among climate negotiators.

Finally, members of Group 1-HEHV and a small subset of NGO representatives (development and environment & market) have a sophisticated understanding of complex systems dynamics, including tipping points, hysteresis and the need for adaptive governance, adjusting goals and policy measures over time. In contrast to most other participants time and urgency play a major part in the belief system of these individuals.

4. Time

In this section I make two arguments about time as a complexity-related topic. First, concepts related to time are patchy, inconsistent and often absent in the minds of climate change negotiators, which is a serious concern given the importance of timelines for addressing the problem. Second, the group of study participants demonstrated a general lack of imagination regarding the long-term future, which limits the motivational power of scientific knowledge about expected climate impacts. The former argument builds on the interview data presented in the CAMs; the latter relies on parts of the interview transcripts that have not been included in the visual representation of beliefs.

The nature of climate change draws attention to a set of specific temporal features of climate change itself as well as the political process that seeks to address the problem. Thinking about climate change requires the ability to imagine the future and to understand how the future is

linked to the present. Important concepts include time scales, for instance, political decision-making over years to decades vs. climate change over centuries to millennia, timelines or timetables for action (i.e., what should be done by when in order to achieve what), time lags and systemic inertia (i.e., how long is the period between a policy measure and a measurable systemic change), peaking (i.e., at what point should emissions reach their maximum levels), and the concept of discounting (Schelling 2000; Weitzman 2009; Gollier and Weitzman 2010; Jacobs and Matthews 2012). Related to these concepts of time is a major concern about political short-term thinking in the face of a long-term environmental challenge (Underdal 2010).

In comparison to the concepts one expects negotiators to grapple with, the interview transcripts demonstrate a dearth of detail and consistency with regard to time; no clear cross-group pattern can be identified. Many study participants, mainly in Groups 3-LEHV and 4-HELV, make no reference to time at all. Members of Group 1-HEHV have a small set of concepts about the future as far out as 2030 or 2050 and converge on a desire to reach a global emissions peak in three to seven years from today. Industry representatives associated with Group 4-HELV share an unusually long time horizon, including concepts like “100-200 more years of fossil fuel consumption, “commodity price increases in 20-50 years,” and “planning as far out into the future as one can think.” All seven members of Group 5-MELV experience a sense of urgency and emphasize the importance of long-term thinking in developing solutions. Their perceptions of urgency, expressed in time-related concepts like “acute,” “lack of urgency,” “2030 is practically tomorrow,” and “race against time,” is particularly surprising given that most of these individuals live in highly developed countries, far from the vulnerable places of the world that already experience impacts. Equally interesting is their ability to think about the long-term, for example, “impacts on generations to come,” “the future beyond grandchildren,” “build for the future - 50-100 years.” But even these individuals who have a real sense of urgency are not able to present a

clear action timeline to address climate change; they do not know what constitutes “too late” or “in time” for global climate governance. Their thinking comes down to the idea that sooner is better and later is better than never.

After the Durban negotiations, the year 2020 has become a focal point for many study participants, but not because of any scientific reasons but because the Durban Platform for Enhanced Action stipulates that a new agreement should be in effect by then. The opinions on this timeline are mixed: some consider it progress; others believe 2020 is too late because global emissions should peak earlier (2017).

These observations demonstrate further that most people do not connect timelines with governance outcomes or the amount of damage climate change will cause to national economies or communities (exceptions are two members of Group 1-HEHV). Neither do they update their negotiation position with the passing of time, for example, reassessing the expected national adaptation costs based on new scientific data and their latest estimates of collective mitigation success, and consequently updating their willingness to pay for multilateral cooperation.

Beyond these general cognitive difficulties dealing with the temporal aspects of climate change and its governance, study participants find it particularly challenging to imagine the distant future. One interview question targeted this issue, asking study participants how they imagined a worst-case scenario of a world where governance efforts had failed and continued GHG emissions had led to the worst climate impacts they could imagine in the year 2080. The reaction to this question showed a surprisingly consistent pattern across all participant groups. With very few exceptions there was a three-stage response. First, people stated that they had not thought about this scenario and found it challenging to come up with a response on the spot. Second, many participants rejected the idea of a worst-case scenario because “by then we will certainly have solved the problem.” When pushed to accept the hypothetical worst-case world,

many made a final attempt to evade the cognitive challenge, arguing that between now and 2080 new technological solutions will emerge, which we cannot even think of today.

Those who tried to imagine a worst-case 2080 scenario fell into two groups. Those who did so for the first time during the interview tended to develop ideas that were mostly linear extensions of current or expected climate impacts: more floods, more droughts, more hunger and poverty, more extreme weather events, and occasionally more resource conflicts. The small group of individuals who were not surprised by this question and presumably had considered this issue before, presented an image of an incredibly negative, dark and scary future world with fewer states, more violent conflict, resource scarcity and a lot less happiness than today. Both groups often referred to movies (“The Day After Tomorrow”) to help them and me visualize what they imagined.

These cognitive patterns suggest that most participants in climate negotiations have either no reason, interest or ability to imagine the distant future, and that their dominant cognitive pattern is the denial of the possibility of governance failure. From an observer’s perspective this is surprising given the continuous failure of the UNFCCC negotiations to produce tangible results over a period of two decades, and the fact that many study participants have been part of this process—which many describe as frustrating and slow—for several years. Given the strong negative emotions associated with the dystopias described by some study participants, one could argue that the avoidance of images of the distant future is a cognitive self-protection mechanism, and might be productive in the sense that it allows people to work on this issue without becoming depressed. On the other hand, the lack of imagination and the rejection of the possibility of failure means that people are never fully cognizant of what is at stake in the negotiations and what they are collectively putting at risk. The ease with which thoughts about potential future damages are suppressed might significantly limit the motivation of negotiators to come to a

cooperative agreement today. How can you determine your own willingness to pay if you don't know what your payment will gain or what costs non-payment could imply?

Research in psychology and sociology describes these cognitive patterns as distancing—an active mental process that represents climate change as something that is distant from the individual or the in-group (Norgaard 2006a). Others discuss them as a cognitive dismissal of very hard problems (Wagner 2012). The phenomenon described here has not yet been captured in the literature, which tends to focus on risk perceptions regarding present problems (Spence et al. 2011), and has identified four interacting dimensions of distancing: social (i.e., the problem is perceived to concern other groups), geographical (i.e., it is a problem in far-away places), temporal (i.e., it will happen in the future), and distancing based on uncertainty (i.e., it is unclear whether harm will really occur) (Liberman and Trope 2008; Spence, Poortinga, and Pidgeon 2012). Since individuals tend to distance themselves from climate change in the present, it is not surprising that distancing effects are even stronger regarding climate change in the long-term future. Events that are not expected to occur in a person's lifetime are naturally less important than those that might have personal relevance. However, in the context of the climate negotiations, this cognitive pattern is highly counterproductive. Given the major implications of action or inaction of this generation for the effects of climate change on generations to come, negotiation participants bear responsibility for the distant future. They may decide not to value it as highly as the present and near-term future in their decisions, but the failure to even consider distant costs as costs is an impediment to good decision-making.

Both cognitive patterns—the absence of clear timelines concerning climate change action and the lack of imagination regarding the long-term future—limit the possible spectrum of feelings of urgency among negotiation participants. Both strongly interact with each other in the sense that the absence of clear timelines and causal connections between action today and the

state of the world in 2080 render thoughts about the distant future unnecessary or at least unlikely.

V. UNDERSTANDING AGENCY IN CLIMATE NEGOTIATIONS

Drawing on the themes outlined above this section explores issues related to agency. What can be learned from the cognitive patterns of study participants about the way agency is perceived, exercised and constrained in the climate negotiations? Who is believed to have agency in climate governance? After a short theoretical introduction to the concept of agency in IR and psychology, I apply the concept of agency to the findings presented above. I argue that IR theories of agency would benefit from two conceptual expansions. First, insights from psychology and the interview data suggest that the inclusion of time—concepts and emotions associated with the past and the future—play an important role for agents' decisions and behavior in the present. Second, hope could be a relevant dimension of agency that has not yet been fully explored either in IR or psychology.

1. Defining Agency

Agency is the freedom and ability to act based on intention or purpose. One could expand that definition to include certain effects or consequences of action, for example, an observable change in the actor's environment, but agency lies in the potential to influence one's environment, not merely in the act of doing so.

IR theorists often present an simplified division of the discipline into a rationalist camp of scholars that emphasize the causal power of the material system structure, reducing agency to an actor's rational response to structural constraints and opportunities, and a constructivist camp

that insists on the causal power of different identities, norms and ideas. What the structure-agency discussion comes down to is a disagreement over the source of causal power and ultimately social change in the international system: are actors structurally coerced by the given material reality that determines their interests, or can they choose to act based on motivations that are independent of system structures? Wendt's efforts to bridge this structure-agency gap with the help of the sociological theory of structuration (the mutual constitution of structure and agency (Giddens 1992) has led him to famously argue that "Anarchy is what states make of it," in other words agents have the ability to choose how they interact with the structure (and with other agents) and consequently change it (Wendt 1992; Wendt 1999). However, as Checkel convincingly argued, many constructivists—and I would argue that group includes Wendt—rely on the causal power of social structures to reconstitute actors' interests, but ignore the theoretically important question of agency (Checkel 1998, 340–342).

Psychologists have developed an individual-centered understanding of agency as a belief in individual or collective self-efficacy, the ability to anticipate and predict future events and to direct one's own behavior in a manner that influences the future in line with one's motivations and goals (Bandura 1989). The emphasis on self-generated action rather than reaction, in other words the causal contribution to one's own motivations and actions, is key to this perspective—agency begins in the mind. But agency is ultimately the result of multiple interacting factors, including cognition and affect, other personal factors and environmental events. Bandura presents a social cognitive theory of agency according to which "Agency embodies the endowments, belief systems, self-regulatory capabilities and distributed structures and functions through which personal influence is exercised." He emphasizes the temporal dimensions of agency and its extension into the future through forethought, intentionality, self-reflectiveness about one's capabilities, and the meaning and purpose of one's life pursuits. Adopting a form of structuration theory, Bandura

argues that “people are producers as well as products of social systems” (Bandura 2001, 1). Importantly, he points to the difference between individual and collective agency, but never elaborates on the link between these two in detail.

These two disciplinary perspectives on agency provide the analytical foundation for addressing the role of agency in the global climate negotiations. The IR lens emphasizes the interaction between an agent—often assumed to be a unitary state—and the structure in which the agent is located (i.e., the international system), more often than not argues that the structure determines or at least constrains agency in important ways. Scholars tend to assume that agents have the ability to interact with and change the given structure, but they do not often explore this ability empirically. The psychological lens focuses on the individual, usually a person rather than a collective entity, and the origins of agency in the cognitive-affective system that interacts with its structural environment, and ultimately seeks to influence that environment through forethought, goal setting and intentional, purpose-driven behavior.

Contrasting these two disciplinary perspectives reveals an important conceptual lacuna—how to bridge the gap between individual and collective agency, for example, between the statement of a single diplomat and the behavior of a state? Not only do IR scholars frequently attribute agency to groups, but so do people in their everyday language and especially diplomats in UN negotiations. Apart from a legal theory of representation, for example, a president who is authorized to represent and act on behalf of a state, collective agency has hardly been addressed in the literature. Even legal representation uses the fiction of the state as an entity separate from those who act on behalf of the state, which supposedly has a will and consequently agency. While individual agency is based on the person’s individual thought processes, collective agency does not have such a basis. A groups does not have a group brain. So how can one attribute agency to collective entities like Germany, Exxon Mobile, Occupy Wall Street, or Greenpeace?

As outlined in chapter 2, the bridge between the individual and the group exists in the minds of individuals, both group members and outsiders, who have mental representations of the group, its characteristics, membership criteria, purposes and so on. These mental representations are shared among many individuals through communication and interaction with the social and natural world, which means that different group members and non-members have the same cognitive patterns concerning the group. Using these mental representations, individuals enact the group through their decisions and behaviors whenever these decisions relate to the group. Since the actions of groups result from the actions of individuals who think about the group, groups attain agency through individual cognition. At the same time individual cognition is never isolated from its social and physical environment.

The notion of collective agency based on individual cognitive processes strengthens a number of insights presented earlier in this chapter, for example, the ability of individual diplomats to think about climate impacts in their home country or even elsewhere in the world, and to experience emotions not in response to any specific personal loss, but in response to the collective loss, including deaths due to extreme weather events, economic damage, or place-based identity threats. The cognitive explanation of collective agency will also be a useful guide for the following sections on agency in the climate negotiations.

2. Agency and National Interests

Intentionality, purpose and motivation are key concepts of agency. IR theory conceptualizes motivations that presumably guide states' actions as national interests. Rationalist theories assume that national interests are determined by the material system structure that presents constraints and opportunities for action—states scan their environment and make action decisions based on a desire to maximize their own net gain, pursuing the path with the largest positive dif-

ference between the costs and benefits of action. Constructivists argue that the externally given system structure does not predetermine national interests. Agents have to interpret and attribute meaning to the system structure, which they do from the vantage point of a certain identity, associated norms and beliefs. Consequently normative and reputational concerns can shape national interests as much as the desire to maximize material gain and power.

Integrating the arguments presented in sections II.1, II.2., and II.3 reveals that both rationalist arguments about costs and benefits and constructivist arguments about identity and norms powerfully shape the definition of an actor's interest: Interest = Cost & Benefits x Identity x Norms. It is impossible to define one's interest without first identifying the group one belongs to and seeks to protect. The group affiliation determines the type and temporal proximity of a threat an actor perceives (potential costs and benefits of action and inaction). The threat perception in turn determines the ethical framework activated in one's mind (normative or rationalist), which triggers associated norms and norm interpretations. When combining these conceptual categories across theoretical boundaries it becomes clear why Group 3-LEHV presses for immediate action, Group 4-HELV is reluctant to commit, and Group 1-HEHV finds itself in a pragmatic middle between these different definitions of national interests. Depending on the constellation of identity group and cost concerns, different levels of cognitive disturbance lead to very different moral sentiments, ranging from cold, seemingly unemotional utilitarian thinking to emotionally charged normative thinking.

Further, the data suggest that it is not always *national* interests that matter in international politics. Some individuals combine, switch between, or solely rely on alternative group identities and their respective interests, including humanity sharing one planetary resource, or vulnerable people deserving protection from climate impacts by other humans, who have the resources to help.

3. Agency and Time

This cognitive approach also reveals that IR ignores an important dimension of agency, which psychologists have already begun to grapple with: the role of time. I argue that theories of agency will have to be expanded to account for the relevance of the past (memories) and the future (anticipation) for decisions and behavior of political agents in the present. Emotions play an important role when theorizing about time and agency, because mental representations about the past and the future can be associated with different types of emotions, and their varying levels of intensity, which can impact their salience for decisions taken in the present.

The data gathered for this study crystallize the importance of two types of time-related cognitive elements for belief systems about climate change. One of these are memories, in particular memories of places that are changing due to climate change, and the emotions associated with those places. The other is anticipation of future climate change, in particular a lack of imagination regarding the distant future. Both of these cognitive elements can but do not have to enter a person's thoughts or decision-making process, and they do so in different ways.

Memories tend to be about things, people and places that one has seen, experienced and felt. They are associated with images, smells, textures, and other sensory experiences that enable the individual to make them vivid in their minds. In the case of climate change, memories are often about things and places that the world or the person might be losing—positive elements of one's past that climate change threatens to remove from the current physical reality. While the memory of those places is certain and cannot be taken away by climate change, the potential loss of the real places linked to the memories affects the way one thinks about the past—it might become more precious. It also links to the future, because the loss of familiar places means that one cannot pass this place and its experience on to one's children. People lose intergenerational stability, which is another form of ontological insecurity.

In contrast to the certainty and colorful, emotional vividness that our minds can activate with memories of the past, thoughts about the future do not benefit from the cognitive intensity that accompanies experience. Instead anticipation of the future depends to a large degree on our ability to imagine and visualize things that have not yet come to pass.

Social cognitive theory integrates the concept of time in the form of forethought and goal-setting, which are symbolic cognitive activities. Bandura emphasizes that these symbolizing capabilities enable the human species to transcend the present and shape our life circumstances and even “override environmental influences” (Bandura 2006, 164). The future cannot be causal for behavior in the present because it has not happened yet, but its cognitive representation in the present can turn concepts about the future into presently motivating factors (Bandura 1989, 1179). The capacity to extrapolate future consequences from known facts enables us to take corrective action to avoid future harm, which presumably increases prospects for human survival (Bandura 1989, 1181).

Not only concepts but also emotions connected with the mental representation of the future matter. Loewenstein and Elster state that people savor anticipated good events ahead of their occurrence, and dread bad ones (G. Loewenstein 1992). Dreading bad climate impacts—to the extent that they can be anticipated and emotionally experienced—should therefore motivate individuals today to make choices that prevent future harm.

The data gathered for this study suggests that the easiest way for the mind to deal with the challenge of anticipation is to use the experience of the past and extend it into the future, even if there is knowledge that the future will be different than the past. The relative weakness of imaginative abilities regarding the future and the associated weakness or even absence of emotions might prevent humans from using their cognitive survival power sufficiently. This weakness affects a person’s ability to value the future or to estimate costs expected to occur in the future

(Berns and Atran 2012). The unprecedented nature of climate change and the perceived temporal distance of severe impacts might simply outstrip current cognitive capabilities. Bandura recognizes this when he states “However, the power of anticipative control must be enhanced by developing better methods for forecasting distal consequences and stronger social mechanisms for bringing projected consequences to bear on current behavior to keep us off self-destructive courses” (Bandura 1989, 1181).

In a nutshell these theoretical and empirical insights imply that the past might have a fairly strong influence on decisions today, while certain, more distant parts of the future might not even enter the cost-benefit calculation or the normative considerations of climate negotiators. In addition to grappling with agents’ relationship to structure, agency theory within IR should include a cognitive dimension that can link time (the past and the future), place and emotion to decisions and behavior in the present.

4. Agency and Hope

I made a number of observations during the interview and CAM process that relate to the concept of hope. One is the fact that most people are fairly pessimistic regarding the effectiveness and speed of the UNFCCC process and the chances of achieving the 2°C target, but at the same time remain surprisingly optimistic about humanity’s collective ability to solve the climate problem. A second observation concerns the apparently fast recovery from moments of hopelessness that some study participants experienced at COP 15 in Copenhagen or COP 17 in Durban. A third is about the general focus on the US despite the minimal contributions the US has made to the climate regime over the last 15 years.

“Hope is ... the perceived capability to derive pathways to desired goals, and motivate oneself via agency thinking to those pathways” (Snyder 2002, 249). Using insights about goal pur-

suit, psychologists have established a strong theoretical link between hope and agency. McGeer argues that hope is “an essential and distinctive feature” and even a “unifying and grounding force of human agency” (McGeer 2004, 100). As Snyder’s definition indicates, hope is a motivational state that combines future-oriented goal setting—“the goal is the cognitive component that anchors hope theory” (Snyder 2002, 250)—with the identification of pathways (actions) towards that goal. Problems are seen as barriers to people’s goals—they decrease hope and consequently weaken perceptions of agency. Not many political scientists have explored this topic, but those who do tend to address questions of collective agency and social mobilization. Courville and Piper suggest that hope can have empowering effects and that NGOs can use hope for political mobilization towards social change (Courville and Piper 2004). Conflict researchers have explored the interaction between hope and fear, finding that memory-based fear tends to override anticipation-based hope in conflict-ridden societies (Bar-Tal 2001).

But even with this theoretical guidance it remains unclear how hope, agency and goal-setting interact with each other. Mutual causal arrows between all three elements are possible. First, hope can affect agency, both positively and negatively (i.e., increasing hope increases one’s sense of agency while losing hope results in a loss of agency.) Second, agency can affect hope: a strengthened sense of agency can increase hope, and a weakening of agency thinking reduces one’s sense of hope.⁷ Third, both agency and hope interact with goals: the type of goal determines the available pathways towards it, while one’s own skills and abilities determine what kinds of actions one is able to take, making certain goals more or less achievable.

⁷ There might be occasions when agency and hope are disconnected. Frankl’s account of his concentration camp experience in *Man’s Search for Meaning* (1959) offers an example for this phenomenon. As an Auschwitz and Dachau inmate he had absolutely no control over his own life, or even daily activities; yet, despite this lack of agency he maintained a sense of hope and found meaning in existence.

Figure 4-1: The Relationship between Agency, Hope, and Goal



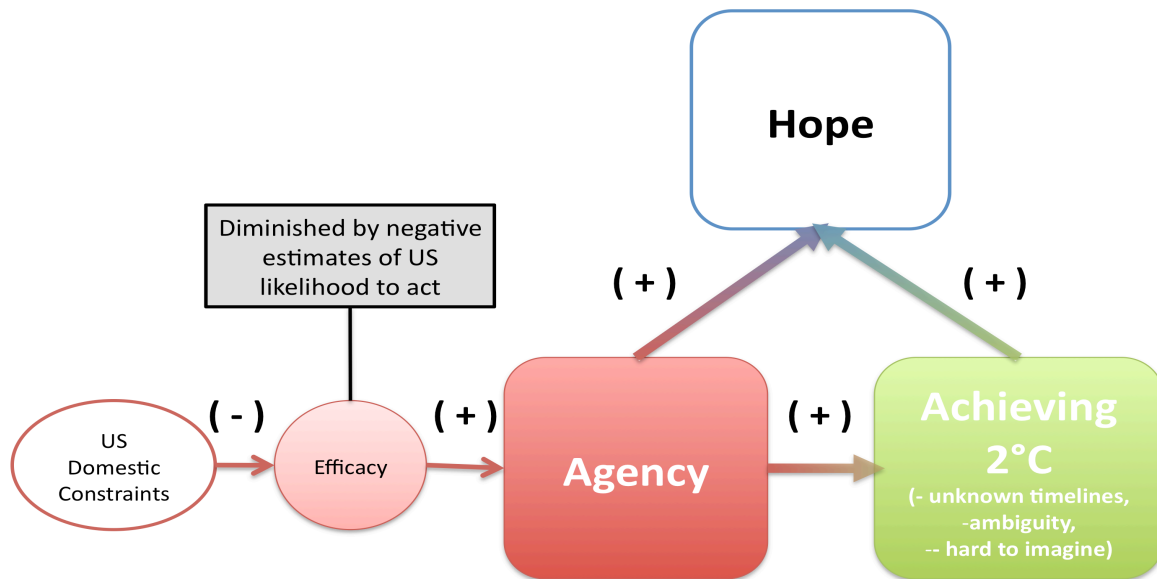
The hope-agency and hope-goal relationships are mutual, meaning that they affect each other depending on their current state and strength. The causal relationship between agency and goal is unidirectional—a sense of agency influences the selection and pursuit of a certain goal. The reverse relationship is not causal but constitutive in the sense that the form and sources of agency depend on the goal chosen. Due to the fundamentally different nature of causal and constitutive relationships I do not include the arrow in Figure 4-1.

The links between agency, hope and goals are asymmetrical in the sense that different factors can influence each corner of the triangle. Without being comprehensive, I argue that agency-related beliefs can be influenced by scientific knowledge, perceptions of resources and power, causal beliefs, available technologies and uncertainty. Concepts related to efficacy are of central importance. In a collective action dilemma like the climate negotiations the individual's assessment of collective efficacy (Bandura 2006, 165–166)—the joint ability of all participants in the UNFCCC process to achieve desired outcomes—is at least as important as the person's assessment of his or her individual efficacy or the efficacy of the delegation representing a country or NGO. Parties to the negotiations constantly have to assess how likely other parties are to support a cooperative solution and how much they are likely to contribute, because the effectiveness of one's own contributions to climate governance depends on what others do.

The mental state of hope or hopelessness might depend on one's beliefs about human nature, one's personal life experience or spirituality. Goal thinking is heavily shaped by values, imagination and in the case of climate change also scientific knowledge.

The CAM analysis provides some clues regarding the sources of agency and hope that study participants currently perceive. As already mentioned, many participants no longer believe that the 2°C target is achievable. When asked what makes them hopeful, individuals pointed to a variety of factors inside and outside the negotiation history, including past successes in creating an institutional architecture (e.g., the Green Climate Fund), recent developments and the potential for change in the private sector (i.e., others' agency without personal involvement or control), observing community activities based on a shared desire to create a better future (i.e., collective agency at the local level with personal involvement), and the believe that a better future is possible, even if not likely today. Participants also identified a set of hope- and agency-diminishing obstacles to a negotiated agreement. The most prominent among them is the position of the US, which study participants believe to be constrained by vested interests and lacking public support for climate action at the domestic level.

Figure 4-2: The Relationship between Agency, Hope, and Goal for the 2°C Target

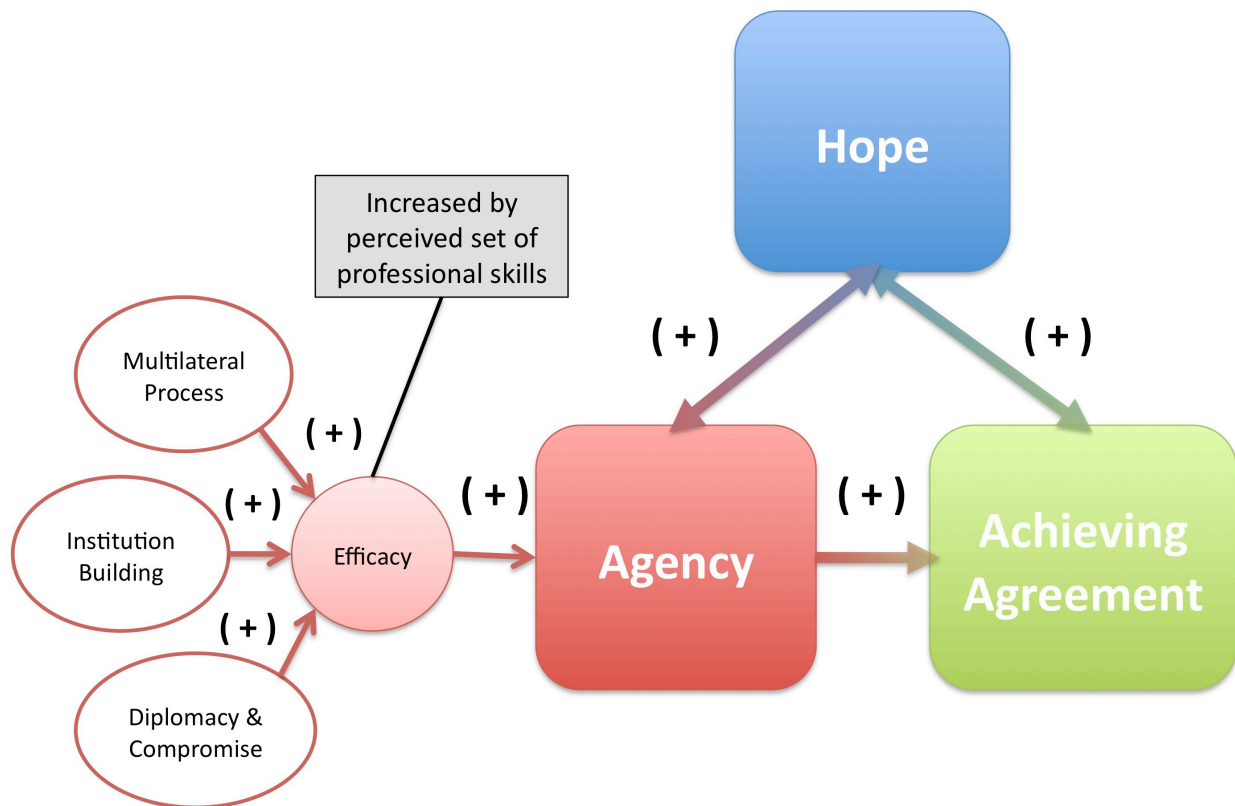


The figure crystallizes two important phenomena in the beliefs of negotiation participants. The first is the fact that the American position has a negative influence on others’ perceptions of collective agency because it weakens collective efficacy beliefs. The general awareness of both the importance of the US for global mitigation and its current domestic political handcuffs (combined with other country’s reluctance to “go first”) significantly reduces available action options and consequently imagined pathways towards the goal—the 2°C target. This leads to pessimism regarding the temperature goal. The goal itself is beset by a number of cognitive challenges outlined above, including the absence of a clear understanding whether and how the 2°C target can be reached. The negative interaction between agency- and goal-related thought patterns results in hopelessness.

Second, in the face of this intractable problem—nobody in the UNFCCC process has a sense of agency with regard to domestic US politics—individuals maintain a sense of hope by shifting their definition of what they are trying to achieve. Instead of pursuing the temperature target or seeking to avoid dangerous climate change, negotiators begin to focus on goals that they can

reach with the tools under their diplomatic control: a political agreement. While negotiators do not see a clear path towards keeping warming under 2°C, they do know how to use the existing political processes and instruments of diplomacy to arrive at a negotiated agreement. The cognitive search for agency and the associated positive experience of hope explain the mental separation between the political feasibility of a multilateral agreement and the scientifically prescribed necessities of action (targets, ambition, timelines). The side effect of the hope-agency interaction is a purely political definition of success that ignores regime effectiveness, but facilitates an unreasonable sense of optimism about the UNFCCC process. Anderson and Bows suggest that scientists contribute to such “unsubstantiated hope” and “neglect for serious constraints for achieving goals” (Anderson and Bows 2012).

Figure 4-3: The relationship between Agency, Hope, and Goals for a Political Agreement



VI. SUMMARY

No single theory of IR can explain the way negotiation participants cognitively deal with and ultimately make decisions on climate change and multilateral cooperation. Even the combination of all major IR theories does not fully capture the relevant thought processes driving political behavior within the UNFCCC. But this cognitive analysis has demonstrated that multiple IR theories contribute important parts of the puzzle, and that their combination rather than their separation creates a much fuller, and more in-depth understanding of the global climate change negotiations. The concepts assumed by rational choice approaches and constructivism strongly interact with each other and create beliefs and ultimately negotiation behavior that one cannot fully comprehend using only one of these theoretical lenses.

The most impressive example of this theoretical interaction is the cognitive relationship between cost categories, different identity groups and norms to create different types of national interests. Emotions triggered by threats to an in-group play a fundamental role in determining a negotiator's stance, especially the differentiation between normative and consequentialist decision frameworks. Emotions triggered by perceptions of power and agency could also play a role. The data contained some indications less powerful groups experience anger and blame big historical emitters for the harm they experience due to climate change. Blame depends on the belief that these big emitters are able to prevent climate-related harm, in other words, that they have latitude for action that they deliberately do not use.

The cognitive exploration of costs and identity has also brought into focus the importance of place as an identity dimension that is often neglected in IR. The nexus between place identity and the expected loss or change of places as a consequence of climate change again demonstrates the importance of emotions in political decisions about cooperation. Individuals who experience

significant threats to their place-based identity both in the developed and developing world favor multilateral cooperation with intensity and urgency that is not matched in the belief systems of people who lack a similar risk perception.

Norms and ideas play a major role in the belief systems of all study participants except Group 4-HELV. The norms contained in the interview transcripts present a much broader spectrum and are significantly less contentious than the current normative debate in the UNFCCC negotiations. Instead of equity and static definitions of historical responsibility, the dominant norms focus on broadening the group of parties who should contribute to a solution (e.g., including all major emitters, the emerging economies, or all countries), and emphasize notions of international solidarity, and a human responsibility to help other human beings in need.

The data also provide some fresh input into the debates around the importance of domestic politics for international affairs, and the question whether an engaged hegemon is necessary in environmental regime building.

With few exceptions the role of science is weaker than expected in the belief systems of study participants. The link between climate science and the goal of climate negotiations is particularly difficult. Most negotiators perceive the 2°C temperature target as a goal imposed by science. This temperature target has largely replaced public good definitions of the goal or purpose of the climate regime. At the same time many individuals across all participant groups are abandoning this target, which has a number of implications for the political process. For example, it remains unclear how negotiators define and understand dangerous climate change, catastrophe, success and failure of climate governance. Given this lack of clarity, they resort to a default definition of success in diplomacy—a political compromise or agreement—rather than use environmental effectiveness as a measure of success.

The cognitive patterns of study participants demonstrate only a weak and unsatisfying engagement with a number of characteristics of climate change. Many participants do not understand some features of complexity, for example, emergence, systemic lags, non-linearity, threshold behavior, or cascading failures. Consequently they rarely address the implications of these problem characteristics for governance. Surprisingly there is very little knowledge about the importance of tipping points. People tend to associate the concept of tipping points with climate science, but hardly ever connect it to the governance goal or governance mechanisms. Concepts of time are inconsistent, and most participants lack imagination regarding the distant future. Both of these cognitive features interact and inhibit the consideration of the full future implications of present decisions about climate governance. Lacking a cognitive link between present (in-) action and future consequences, decision-makers have a limited sense of responsibility for the future. Most of them are not aware of the extension of this generation's causal powers into the distant future, and do not experience a sense of responsibility that corresponds with this new anthropogenic power. In a way, they are lacking the ethical frameworks for such long-term, inter-generational problems.

However, the group of study participants do not perceive these cognitive shortcomings as such. Instead they are generally confident that the problem can be solved with the existing knowledge and governance tools, that uncertainty is no impediment, complexity is not overwhelming or paralyzing, and that the imperceptibility of climate change is only a problem at the domestic level where publics need to be mobilized.

Some of these insights provide important insights into the role of agency in climate governance. Perceptions of a single actor—the United States—severely constrain perceptions of collective agency of the international community. The combined assessment of the US as powerful—a mitigation-related belief grounded in a scientific understanding of climate change—and as very

unlikely to cooperate reduces people's sense of multilateral agency. People base their assessments of the likelihood to cooperate on perceptions of domestic political constraints in the US: vested interests, an unsupportive public, and maybe even democracy more generally. They also link these assessments to beliefs about the US' strategic interests in the international system. Observing an ongoing power transition, they believe that the US seeks to protect the status quo of economic power distribution in the world, trying to prevent emerging powers from gaining competitive advantage through climate policy. Such pessimism about the UNFCCC process often results in a turn to processes outside the UN, which offer more reasons for optimism: other multilateral activities with fewer participants, civil society activities, the private sector, technological developments, including a price drop for renewable energy technologies, or community-based initiatives. Nobody can or does assess the activities in terms of their effectiveness.

Further, when negotiation participants identify parts of the solution space, which the negotiation process is not able to address, this recognition can constrain collective beliefs about agency. This applies, for example, to the idea that solving climate change requires a new development paradigm, or a change of mind of domestic voters.

Time is another important aspect of agency-related beliefs that shape decision-making in the climate negotiations. Given the cognitive ease to evoke memories of the past and re-experience associated emotions, and at the same time the cognitive difficulty to imagine the long-term future and prematurely experience emotions associated with that future, memory plays a much stronger role in political decision-making than anticipation. Because of the special temporal properties of climate change this different impact of the past and the future on present decision-making poses significant challenges to global governance.

Finally, a closer look at agency and hope has revealed interesting cognitive patterns regarding the definition of a goal of the climate change negotiations and related measures of success. If

a goal appears unachievable, as the 2°C target does at the moment, people experience a decrease in their sense of agency and lose hope. Since hopelessness is a negative mental state that people seek to avoid, they turn to alternative goals that appear more achievable. In the case of climate change, the negotiators separate and maybe even replace the temperature goal with the diplomatic goal of reaching a political agreement. The latter gives negotiation participants a stronger sense of agency and recurring small boosts like the Copenhagen Accord, the Durban Platform or the Doha Gateway. This has negative implications for regime effectiveness, but also for the public legitimacy of the UN process.

CHAPTER 5

Six Belief Systems on Climate Change and Multilateral Cooperation

This chapter presents the method, results, and limitations of the Q analysis I conducted for this study. In contrast to the CAM-based inquiry, I do not separate the report of empirical results and their interpretation into two chapters. Q offers a systematic approach to revealing shared viewpoints or belief systems without the need for preexisting assumptions about participant groups that were necessary to facilitate the CAM analysis. Q method complements cognitive-affective mapping by identifying existing points of view that are shared by individuals across all participant groups. But rather than focusing on individual concepts, their emotional valences, and connections, Q takes a macro perspective and reveals entire belief systems—sets of coherently linked beliefs that are held by groups of individuals. Its purpose is to identify these perspectives and the differences between the various points of view regarding a certain topic.

After introducing the method in section I, section II offers some general observations about patterns in the data set that are independent of the factor analysis at the heart of Q method. I present six different belief systems ('factors' in Q language) I identified with the Q analysis in section III. Where the results provide such opportunities, I establish links to the CAM analysis in addition to the standard factor interpretation. Continuing the analytic patterns of the CAM chapter, I emphasize the relevance of three cognitive meta-elements in each factor: structural constraint and agency, identity and justice. Section IV turns to some qualitative data gathered from study participants after the Q sort, using their responses to four basic questions to establish what I call thought communities. The section explores the relationships between these thought communities, the six participant groups, and the six factors I identified with the Q analysis.

I. Q METHOD

Q method (Brown 1980) is a well-established research technique created by William Stephenson in 1935 (Stephenson 1935) for the systematic study of subjectivity. A Q study enables the researcher to identify and explore the given viewpoints on a specific topic within a certain population, by analyzing patterns (underlying ‘factors’) in the opinions of participants. These opinions are elicited in a special type of survey that requires participants to rank-order a given set of statements about the topic. The statistical analysis of these rankings reveals so-called factors that are shared by several individuals (clusters of shared subjectivity).

The method has been applied in multiple fields, including psychology (Stainton Rogers in Harre, Smith, and Langenhove 1995, chap. 12; Watts and Stenner 2005), political science (S. R. Brown 1980; Jeffares and Skelcher 2011), health (Stenner, Cooper, and Skevington 2003), and policy studies (Ockwell 2008). Lately it has become increasingly popular in environmental studies, which place emphasis on stakeholder engagement (Webler et al. 2003; Rutherford et al. 2009; Curry, Barry, and McClenaghan 2013), narratives, and discourse analysis (Barry and Proops 1999; Dryzek 2005; Cairns 2012). The technique uncovers a high degree of qualitative detail about individual and collective thinking, and allows the researcher to gain a holistic understanding of existing belief systems—a substantive gestalt of a point of view rather than a structural one. At the same time it is driven by statistics (inverted factor analysis), offering a methodological bridge between qualitative and quantitative approaches. The quantitative basis of the analysis differentiates the method from other more textual approaches to exploring beliefs, but also differs from other quantitative techniques such as opinion polls and surveys.

A Q study seeks to elicit different viewpoints regarding a specific subject matter; here multi-lateral cooperation on climate change. A key strength of Q is that it does not require that any

shared perspectives are known or even hypothesized in advance; rather these belief systems emerge from the data. Although the researcher does not know the number of existing viewpoints at the outset, Q method assumes that, regardless of the issue domain, the number of possible viewpoints is finite, generally smaller than seven (Barry and Proops 1999, 339), and normally about five (S. R. Brown 1980, 62). But Q studies with only two or three factors are common.

In a Q study participants attribute their own, personal meaning to a fixed set of statements (stimulus items) they rank on a pre-arranged grid that approximates a normal distribution, with few statements towards the extreme ends of the scale and most items in the center columns (Watts and Stenner 2012, 15–17). This sorting exercise reveals participants' individual beliefs and belief structure through their interaction with the statements (operant subjectivity). By correlating individuals (rather than objective traits) in an inverted factor analysis (Watts and Stenner 2012, 7–14), the correlation of Q sorts provides information about similarities and differences in the structured beliefs of groups of people. The emergent groups of participants sharing a viewpoint can differ from the groups I predefined for the purpose of participant selection, and also from the existing negotiation alliances in the UNFCCC process. This might provide useful insights regarding the possibilities of creating different political dynamics around climate change at the global level based on agreement at a deep level of subjective beliefs rather than a higher positional level of national or alliance interests.

More broadly Q method permits a conception of subjectivity that is complex and multifaceted in the sense that individuals may not only hold one clearly bounded perspective, but share elements of a number of different factors (Harré and Gillett 1994, 25; Hajer 1996). Binary categories (e.g., male vs. female, or developed vs. developing) are often not able to capture this complexity, but Q method provides opportunities to explore these multi-dimensional perspectives.

Critiques of Q studies often attack the inability of the method to produce certain insights, which it does not seek or claim to produce in the first place, such as the observation of change in beliefs over time with a single Q sort or the lack of the results' representativeness of the larger population. The limited aim of a Q study is to identify existing points of view based on individuals' internal frame of reference, and the difference between these existing viewpoints. It does not and cannot make any claims about the characteristics of the population at large (e.g., all participants in global climate negotiations), such as the share of the population associated with different factors. Therefore a Q study does not claim to be representative, in the sense that all possible viewpoints have been identified, or that the results are indicative of the importance and distribution of viewpoints within the relevant community (Dryzek and Berejikian 1993, 51). It is always possible that one or several viewpoints are missing, because participants who hold this view did not participate in the study. But generally the method has proven to quickly unearth the most relevant perspectives on any given issue. Understanding those additional characteristics of the factors is not the aim of Q method and can only be explored with additional methods, for example, representative surveys that build on the factors identified with an earlier Q study.

Conventional Q method only assesses beliefs without paying specific attention to the associated emotions. Since the technique is flexible in this respect, I adjusted the set-up to include an emotional dimension in the analysis, simply by adding statements about emotional states associated with concepts and beliefs, and placing special emphasis of affect in the factor interpretation stage.

1. General Process

A Q study proceeds in five steps. First, the researcher selects the topic of exploration and the relevant population—the communities whose viewpoints are of interest and require exploration.

Second, using a variety of sources, the researcher identifies the full range of opinions on the topic that are relevant to the selected population (R. Brown 1986, 56). From the universe of possible statements, often called the *concourse*, the researcher selects a limited number of representative statements that capture the largest possible opinion space, and maximize the ability of all study participants to express their views (*Q set*). This is a deliberate effort to create boundaries around the study topic. Third, facilitated either manually (printed statement cards) or by an online platform, study participants are asked to respond to the *Q set* by rank-ordering the statements on a pre-determined scale based the intensity of their own agreement or disagreement with these items. Fourth, statistical analysis of these *Q sorts* enables the extraction of ‘factors’—patterns in the data based on the similarity of statement rankings that identify different points of view. The initial factor extraction is complemented by factor-rotation—the maximization of differences between factors that help explore various hypotheses, for example, singling out individuals who have a special role within the investigated community. The *Q sorts* of individuals who have strong factor loadings are used to calculate the factor scores—a standardized *Q sort* representing a specific factor. Finally, the resulting factors require interpretation. The systematic analysis of the content of these different points of view, their most important differences, and the individuals associated with a certain viewpoint can create a deep, holistic understanding of the subject matter explored.

2. Application

I designed a pilot study to test and improve the *Q study* design, in particular the quality and number of statements in the final *Q set*. For the pilot study 44 participants from ten countries completed an online *Q sort* containing 73 statements (Appendix Ch5-1). None of the participants

are involved in the global climate negotiations. Appendix Ch5-2 contains a summary of results from the pilot study.

a. Concourse, Q Set & Grid

Creating a concourse—a set of statements that reflect all possible opinions on the subject matter within the relevant community—usually relies on multiple sources, including interviews with members of the community, news articles, books, and academic literature. Since access to the relevant community for an exploratory interview was not possible in the available time window for designing the study, I relied on a range of text sources, including the coverage of the climate change issue in the print media (US, Canadian and German newspapers), online sources (UNFCCC website, blogs, NGO websites), journal articles, and discussions with colleagues researching climate change politics. I generated an initial list of statements with a number of items in eight different themes: science/causes, problem nature, actors, policy goals and options, economics and development, identity, ethics and justice, and special characteristics of climate change. These were honed down to 73 statements for the pilot study (Q set).

Using the results of the pilot study I identified a number of statements that yielded very little additional insight, for instance, because all participants ranked them similarly (no differentiation), because they captured important views of a domestic rather than global discourse, or because no participant considered them important. These were removed from final the Q set. I changed and added some statements based on the written responses of pilot study participants. Appendix Ch5-3 contains the final Q set (65 statements).

Based on the number of statements I chose the following grid structure with a score range from -5 to +5.

Figure 5-1: Forced-choice Frequency Distribution for Q Sort

-5	-4	-3	-2	-1	0	1	2	3	4	5
(2)										(2)
	(4)								(4)	
		(6)						(6)		
			(7)				(7)			
				(9)	(9)	(9)				

←	DISAGREE WITH MOST	AGREE WITH MOST	→
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b. P Set

Two main goals drive the selection of participants from the community of interest: capturing a minimum diversity of existing viewpoints, and including viewpoints that matter in relation to topic of investigation (Watts and Stenner 2012, 70–71). Strategic rather than random sampling is desirable, using initial hypothesis and existing knowledge about the issue while taking into account practical constraints specific to the sampled population.

Participant selection for this project emphasized diversity over importance of viewpoints, and was described in more detail in the introductory chapter of this thesis. I invited all 55 individuals who participated in the interviews for the CAM analysis to take part in the Q study. The resulting number of participants in the Q study is 28. This is not an unusual P set size in published Q studies, but might still seem small given the complexity of the issue and the corresponding diversity of viewpoints. However, the specific circumstances of participant selection placed two compounding constraints on the P set. First, the accessibility of participants in global climate negotiations is limited due to their involvement in an ongoing political process (reluctance) that involves a heavy international travel and meeting schedule (time constraints). More importantly, since the

pool of invitees was limited (55) and had severe time constraints the number of participants (50%) is satisfactory.

More generally, the question how many study participants are necessary and desirable deserves some explanation. The logic of large-n sampling in quantitative studies with a claim to universality and representativeness does not apply to Q methodology. Instead the aim of a Q study is to involve a sufficient number of participants to “establish the existence of a factor for purposes of comparing one factor with another.” (S. R. Brown 1980, 192). Generally the P set should be smaller than the Q set (here, less than 65), but good Q studies have been carried out with as few as twelve participants (Niemeyer 2004). Given the complexity of the subject matter, I worked with the assumption that there might be a relatively high number of viewpoints (5-7), possibly closely related to the six groups defined for participant selection (see section IV below). Since it would be desirable to have at least two individuals with similar perspectives and consequently similar Q sorts, 10-14 participants might have been mathematically sufficient, but every additional participant increased the probability of including a broad range of viewpoints and of having at least two participants share a viewpoint.

There are two reasons why some uncertainty regarding the quality of the statistical analysis remains. First, a participant’s viewpoint could not be known before selection, especially given the possible difference between the negotiation positions they present in public and their private beliefs. Second, participants self-selected into the Q study. For example, it is possible that half of the P set shares the same viewpoint, increasing the chances that some viewpoints captured in the CAMs are not represented at all, or that a single Q sort becomes a factor. However, these concerns are limited because the final P set is a fairly good representation of the larger set of study participants, containing fifteen diplomats, with at least one individual from five out of the six

participant groups (Group 1-HEHV is missing), and thirteen NGO participants from seven out of eight different NGO types (sub-national governments are missing).

In order to reveal researcher bias I participated in the Q study, which enabled the comparison of my own view with those of the research participants.

c. Sorting

Given the geographic dispersion of study participants and the difficulties of recruiting individuals for more than one in-person meeting, Q sorting was conducted online, using FlashQ programming and hosting services of <http://www.qsortonline.com/>. Q researchers often prefer face-to-face sorting, but that was practically not possible. Online sorting has the advantage that the researcher does not interfere at all with the sorting process, and that the participant can choose a time and place that is most convenient for the exercise, rather than a scheduled meeting time. One can argue that these conditions create a more accurate and unbiased sort than one generated while interacting with the researcher. Previous Q studies provide evidence that online or remote sorting does not affect the quality of the results compared to face-to-face sorting sessions with possible instructions and help by the researcher (Van Tubergen and Olins 1979).

The Q survey asked participants to provide basic demographic information, and to comment on the statements they ranked under +5 or -5. The web survey also inquired whether they had ‘missed’ particular statements to express their point of view, and to point out which statements had been particularly difficult to place in the grid (e.g., because of conflicting interpretations). Appendix Ch5-4 contains the instructions for the sorting exercise and the list of additional questions.

d. Factor Extraction & Rotation

The most common software to conduct by-person factor analysis is PQMethod, provided by Peter Schmolck as freeware (<http://www.lrz.de/~schmolck/qmethod/>). Other software packages

are available for purchase. I used the recently developed program AdvanceQ, provided free of charge by Simon Niemeyer and David Moten (Moten and Niemeyer 2008).

I developed the factor solution in four steps: (1) extraction of six factors, (2) factor rotation, (3) identification of sorts with significant loadings on a factor, and (4) calculation of factor scores using these significant loadings. Steps two and three were iteratively linked—the pattern of significant loadings informed rotation as described in more detail below.

(1) Factor Extraction: Two methods are available for this analytic step: Centroid factor extraction is the standard in Q method research, and principle component analysis (PCA) is a similar mathematical procedure that generally yields the same results. Since both methods generated similar factors for this data set I worked with the Centroid method to avoid the controversy over the comparability of PCA.

Multiple criteria can guide the decision how many factors to extract. The standard approach is to extract only those factors that have an Eigenvalue (sum of all squared loadings of a factor) higher than 1.0 and/or at least two significant factor loadings (Watts and Stenner 2005, 105). The factor solution I present below fulfills both of these criteria, but also sought to emphasize simplicity, in other words, minimizing the number of factors without losing a significant amount of information. I tested eight-, seven-, six- and five-factor solutions. Even when extracting eight factors, some solutions would meet the Eigenvalue and significant loadings criteria. However, the similarities between some of these eight factors were too great to offer interesting insights; presenting minor variants of the same factor. The six-factor solution offered the best compromise in terms of maximum differentiation and minimum redundancy.

Other variables that can influence the selection of a factor solution but did not play a role here include the total variance explained (here this value was consistently around 60% for a broad range of tested solutions), and the number of persons not loading on any factor. In this data

set there is one outlier who consistently loaded weakly on one factor, and depending on the solution would drop below the significance threshold. Finally, factor stability was not an issue because similar individuals tend to cluster across several solutions.

(2) Factor Rotation: Factor rotation can be performed either manually, guided by theoretical assumptions and conceptual knowledge about the data, or using purely mathematical criteria, for example, with a Varimax rotation that maximizes the variance explained and single-factor loadings. While the automated statistical solution is easier, it is not necessarily better in terms of revealing relevant patterns in the data (Watts and Stenner 2005, 99). Therefore by-hand rotation is often preferred in Q studies. Watts and Stenner recommend the combination of both approaches.

I followed this advice and performed a Varimax rotation followed by a number of hand rotations to create a ‘cleaner’ solution with fewer highly confounded sorts. While confounded sorts could not be removed, the overall clarity of the developed solution was maximized by efforts to increase the number of sorts loading on only one factor and to minimize the number of sorts with more than two significant factor loadings.

The goal of hand-rotations was to align clusters of sorts with the axes of the two-dimensional factor diagrams rather than allowing them to cover the space between the axes, which leads to multiple loadings (1/2 \rightarrow +13°, 2/6 \rightarrow +42°). In addition, small adjustments were made to minimize the number of sorts with three significant factor loadings. These rotations maximized a sort’s loading on one factor and minimized its loading on another until it would drop under the significance threshold of that second or third factor (4/6 \rightarrow -3°, 2/8 \rightarrow -2°, 8/9 \rightarrow +4°).

(3) Identifying Significant Loadings: Factor loadings are correlation coefficients indicating the degree to which a sort is associated with (i.e., correlates with) a factor. The significance threshold at a 99% confidence level is calculated with formula = 2.58 * (SE), where the standard error (SE) is calculated using the number of statements in the Q set: $SE = 1 / \text{SQRT}(65)$. Using

these calculations the significance level for this study is 0.32. Given the high number of confounded sorts I raised the significance level to 0.36.

Table 5-1 presents the resulting factor loadings, Eigenvalues, variance explained, and communality (percentage of a Q sort associated with the other sorts, h^2). The loadings of Q sorts associated with a factor are shaded; blue indicates the sorts with three significant factor loadings that have been excluded from the calculation of factor scores.

Table 5-1: Rotated Factor Loadings

Participant ID	Factor Loadings						h^2
	A	B	C	D	E	F	
1	0.23	0.21	0.27	0.18	0.42	0.36	0.51
2	0.19	0.20	0.28	0.59	0.48	0.20	0.78
3	0.33	0.59	0.09	0.25	0.37	0.09	0.67
4	0.31	0.43	0.01	0.25	0.27	0.47	0.64
5	0.01	0.27	0.09	0.47	0.29	0.48	0.61
6	0.52	0.28	0.45	-0.01	0.50	0.21	0.84
7	0.33	0.08	0.05	-0.26	0.00	-0.09	0.19
8	0.11	0.50	0.22	0.05	0.56	0.19	0.67
9	0.17	0.17	0.59	0.13	0.20	0.18	0.50
10	0.54	0.24	0.26	0.27	0.51	0.08	0.76
11	0.33	0.27	0.62	0.22	0.20	0.26	0.72
12	0.51	0.41	0.19	0.45	0.30	-0.02	0.75
13	0.28	0.39	0.36	0.32	0.22	0.22	0.55
14	0.14	0.55	0.40	0.40	0.30	0.03	0.74
15	0.25	0.36	0.13	0.26	0.38	0.26	0.49
16	0.70	0.25	0.23	0.41	0.12	-0.04	0.79
17	0.28	0.43	0.61	0.26	0.09	-0.04	0.72
18	0.43	0.04	-0.01	0.15	0.36	0.23	0.39
19	0.41	0.04	0.32	-0.15	0.11	0.20	0.35
20	0.37	0.15	0.41	0.45	0.20	0.32	0.67
21	0.32	0.20	0.31	0.37	0.18	0.27	0.48
22	0.40	0.43	0.31	0.07	0.11	0.44	0.64
23	0.13	0.17	0.33	0.48	0.58	0.01	0.73
24	0.14	0.73	0.11	-0.01	0.08	0.10	0.58
25	0.52	0.10	0.42	0.52	0.24	0.07	0.79
26	0.41	0.23	0.24	0.43	0.15	0.31	0.59
27	0.28	0.10	0.66	0.05	0.25	-0.11	0.61
28	0.29	0.43	0.31	0.55	0.20	0.26	0.77
29	0.17	0.43	0.31	0.19	0.08	0.24	0.42
Eigenvalue:	3.5	3.5	3.4	3.1	2.8	1.7	
Variance:	12.2	11.9	11.9	10.8	9.5	5.7	
Total Variance Explained (%):							62.0

The process of factor extraction and rotation reveals that the data set contains a large number of confounded sorts, which is unusual compared to other Q studies. The result is consistent across several solutions, including PCA and Centroid factor extraction, a five-, six-, seven-, or eight-factor solution, and multiple rotation options. The solution developed through multiple rotations contains seven sorts that load on a single factor only. The majority of sorts (15) have two significant factor loadings; six sorts show significant correlations with three different factors.

In the Q method literature the treatment of confounded sorts is almost non-existent. The standard approach relies solely on pure sorts that load only on one factor, excluding all confounded sorts because they “muddle the waters” since they offer no clear factor association (Stephenson 1953, 107–109; S. Brown and Robyn 2004, 114–117; Akhtar-Danesh, Baumann, and Cordingley 2008). Although a detailed discussion in the published literature is lacking, past email communication over the Q Method list serve run by Stephen Brown has provided some arguments for the inclusion of confounded sorts, and at least greater theoretical attention to this issue. One can argue that the existence of confounded sorts merely reflects the reality of human thinking—people often hold or share parts of different points of view, and each point of view can get activated by different circumstances. Depending on the Q set, different beliefs get activated in the course of the sorting exercise and become part of the data. Other examples for confounding sorts could be conflict mediators, who can associate with two or more parties, or ideological moderates who share parts of a conservative and a liberal perspective.

This data set suggests that relying on pure sorts only would provide a severely limited picture of the existing points of view, removing more data from the analysis than including in it. Confounded sorts are a dominant feature of the data, which could have several reasons. First, it might reflect the fact that this study deals with a particularly complex subject matter where multiple overlapping beliefs are possible and occur with a greater likelihood. Second, confounded sorts

might indicate that the subject matter is not yet settled and that strong and clearly distinguishable camps have not yet formed. It could be a sign of immaturity or a time period of changing perspectives. Finally, it is possible that rather than representing a comprehensive point of view, a factor concerns one of several sub-issues. In that case multiple factors could be part of a person's view and several factors might be needed to understand someone's larger belief system. These sub-issues might be combinable in several ways, leading to different patterns of confounded sorts.

Whatever the underlying reason for the large number of confounded sorts might be, they might offer bridges between possible belief systems and current negotiation positions—avenues along which cognitive change could be fostered. For example, if sort 1 loads on Factor A and B, and person 2 loads on Factor A only, person 2 might find it comparatively easy to take on the beliefs of Factor B.

(4) Calculation of Factor Scores: A factor score (also called factor array) is created by calculating the weighted average score for each statement from all sorts that load significantly on the factor. Due to the nature of this specific data set, I further constrained the calculation of factor arrays by excluding all sorts with more than two significant loadings. This removal from the factor score calculation left their impact on factor extraction unaffected.

This exclusion affected six sorts (including my own), which had each three significant factor loadings. In terms of participant groups this concerns two NGO representatives (Environment & Market, Business), two diplomats in Group 4-HELV, and one in Group 2-MEHV.

This exclusion at the last stage of the mathematical analysis has implications for interpreting the resulting factor scores. In addition to missing the perspectives of a number of individuals who took part in the CAM analysis but not in the Q sort (e.g., BASIC, AOSIS, ALBA and most LDC diplomats), this limits the breadth of views represented in the resulting factor solution. Ta-

ble 5-2 shows the distribution of Q study participants across the six participant groups, divided into diplomats (black dots) and NGO representatives (red dots). Table 5-3 removes the five individuals whose sorts did not contribute to the final factor scores.

Table 5-2: Q Study Participants and Participant Groups

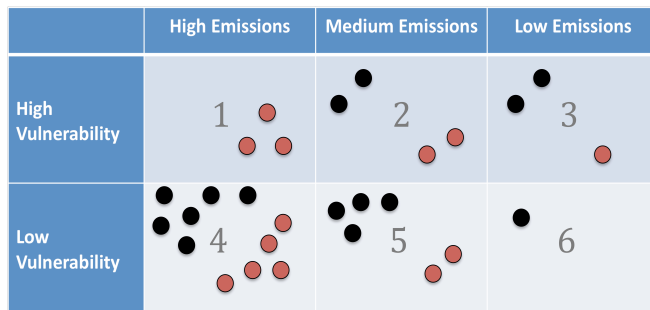
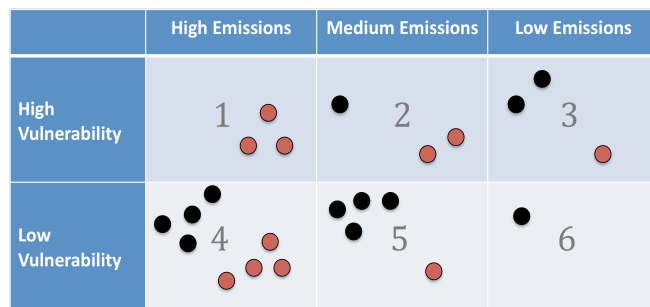


Table 5-3: Q Study Participants Who Contributed to Factor Scores



The tables demonstrate that the factors identified with the Q analysis are mainly expressions of perspectives in participant Groups 2-MEHV, 3-LEHV, 4-HELV, 5-MELV, and among youth NGO representatives.

e. Interpretation

I present a detailed interpretation of the factors below (III). The process of factor interpretation followed Watts and Stenner’s approach, which allows for a comparison across factors while creating a holistic intra-factor logic and narrative. The key categories for factor comparison are: (1) items ranked +5, (2) items ranked higher or equally high in factor array X than any other factor array, (3) items ranked lower or equally low in factor array X than any other factor array, and

(4) items ranked -5. Items in the middle of the distribution deserve special attention because they can have different meanings. Usually Q methodological studies assume that items ranked 0 have no meaning for the factor, because the participant placing this item did neither agree nor disagree with the statement in question and is therefore indifferent regarding its content. However, different interpretations of the 0 ranking are possible. Some participants may have felt deeply conflicted regarding a particular statement, because they had two different interpretations of it, each eliciting a different level of (dis)agreement (i.e., a case of too much rather than no meaning). Further, it is possible that participants agreed with a high number of items and found themselves forced by the grid to place some of these items in the center or even to left of the 0 column. Participants' written comments at the end of the Q sort as well as feedback via email suggests that at least one participant experienced such difficulties.

II. GENERAL OBSERVATIONS

1. General Data Patterns

a. Statements With Broad Agreement Among Study Participants

Both the raw data and the factor scores contain a set of statements that elicited very similar rankings among a large number of Q study participants, which implies that there is broad agreement regarding the relevance (valence and weight) of these statements among a diverse set of negotiators. The raw data contain ten statements that received consistently high rankings (+4/+5 or -4/-5) by more than a third (minimum 10) of all Q study participants.

Table 5-4: Statements with a High Number of Similar and Extreme Scores

Statement	Number of Scores				Total (%)	Min/ Max Score
	+5	+4	-5	-4		
1. Human-released greenhouse gases are causing significant climate change.	7	10			17 (58%)	0
2. I don't trust what scientists say about climate change.			8	9	17 (58%)	0
4. I do not believe that we will see significant effects of climate change in my lifetime.			4	10	14 (48%)	2
6. Climate change is mainly an issue for the developing countries.			7	6	13 (45%)	0
15. The climate problem should be left to the markets.			5	6	11 (38%)	4
18. Politicians need much stronger voter support and pressure from political movements to create meaningful climate policies.	4	6			10 (34%)	-4
21. Neither states nor markets nor civil society can solve this problem on their own—climate change is a multilevel problem and requires action at all of these different levels.	4	9			13 (45%)	-1
22. A key element in solving the climate problem is the need for fundamental value change within our societies.	9	4			13 (45%)	-5
47. Problems that might arise decades from now are not important to me.			6	9	15 (52%)	-1
58. It is already too late to do anything about climate change.			5	9	14 (48%)	2

Three statements stand out, with more than 50% of Q study participants ranking them similarly high or low. Statements no. 1 and 2 concern the very foundation of the negotiations: the reality of climate change, its anthropogenic causes, and the trust in science as the most important source of knowledge about the problem. The only surprising aspect of the scores for these two statements is not their similarity or broad agreement with them (nobody assigned them a negative score), but the fact that even after more than 20 years of negotiations these statements are considered to be some the most important among 65 statements regarding climate change governance. Instead of having become normal and ranking somewhere in the middle of the positive range of scores, participants felt the need to state strong support for the simple basics. One explanation for this pattern might be the cognitive ease to identify these fundamental beliefs and

facts as important among the complex set of arguments one can make about climate change, and the general difficulty to attribute higher and lower importance to these arguments. Another explanation might be sought in the context of persisting doubts about the reality of the problem and the trustworthiness of scientists within a number of countries today, most prominently the US. Although these questions are no longer contested among negotiation participants, stating one's convictions still seems to be important and necessary.

The consistently extreme negative scores for statement no. 47 are an expression of concern for the future and an important acknowledgement of the relevance of thinking about the future when discussing climate change in the present. However, it is a very general statement that does not specify how or why this concern about the future matters or should be acted upon. The statement cannot be fully understood in isolation, but needs to be interpreted in relation to other statement scores in the context of a person's entire ranking. One clue might already be offered by the broad disagreement with statement no. 4. If people expect to experience climate change impacts in their own lifetime and have an interest in avoiding those, that would explain why problems that arise decades from now are important to them.

Statements 15, 18, 21, and 22 concern the possible policy and governance approaches to climate change. They acknowledge that climate change is a multilevel problem that cannot be solved with a multilateral treaty alone, and that the national and maybe even sub-national levels are extremely important. Value change, voter support and grassroots pressure on politicians are possible mechanisms of change that can influence a negotiated outcome only indirectly. Further the call for value change (22) but rejection of laissez-faire free-market policies (15) could indicate broad support for a value set that is not driven by neoliberal ideas that prioritize growth driven by self-interested producers and consumers.

Statements with very similar rankings but not at the extreme end of the score spectrum include the following:

- 8. Climate change will result in violence and human deaths. (8x +1 and 10x +2)*
- 16. It is best to leave the development of climate solutions to regions, cities, and local communities - they have been much more successful than UNFCCC negotiations. (10x -1 and 6x 0)*
- 17. Individual contributions don't make a difference when it comes to climate change. (10x -1 and 7x -2)*
- 26. Limiting average global warming to 2°C will be sufficient to prevent major damage. (10x -1 and 8x 0)*
- 46. Elected officials have a political responsibility to protect the interests of their constituency - the present rather than future generations. (11x -2 and 7x -1)*
- 59. There are moments when I lose all hope that the UNFCCC process can solve this problem. (6x 0 and 11x +1)*

The process of factor extraction reduces the number of comparable scores to six, making the range of scores for a statement (e.g., -3 to -5) a more interesting measure than the number of factors with the same score. After factor extraction major agreements remain across the six factors, but especially statements with a big score range disappear from this list (e.g., statements 15, 18 and 22). A number of new areas of agreement emerge.

- 16. It is best to leave the development of climate solutions to regions, cities, and local communities - they have been much more successful than UNFCCC negotiations. (-1/-2)*
- 33. Economic growth and jobs must take priority over climate concerns. (-2/-3)*
- 47. Problems that might arise decades from now are not important to me. (-4/-5)*
- 60. Climate change scares me because I don't know what's going to happen. (0/-1)*
- 64. I have a hard time imagining the consequences of climate change for my community and my country. (0/-1)*

Eighteen additional statements show large similarities too, but with a score range of two rather than one (1, 4, 6, 8, 17, 20, 25, 26, 27, 30, 31, 40, 46, 54, 58, 59, 62, 63).

For the Q study these high agreement statements, especially those with extreme scores, pose a challenge, because they make it difficult to differentiate the factors. The extreme scores are

crucial to identify key differences between the factors, and the amount of similarities in these high rankings limits the available information for interpretation. Consequently factor interpretation has to become much more detailed, drawing on differences in lower score ranges and even towards the center of the score distribution. On the other hand, these agreements bode well for the negotiations themselves. Although one cannot extrapolate from the Q study to the larger population of negotiation participants, the finding suggests that there are significant areas of agreement that various parties rely on. It is particularly important to recognize these similarities between participant Group 4-HELV and other groups, moderating the concern about the differences between them identified in the CAM analysis.

b. Statements With Large Disagreement

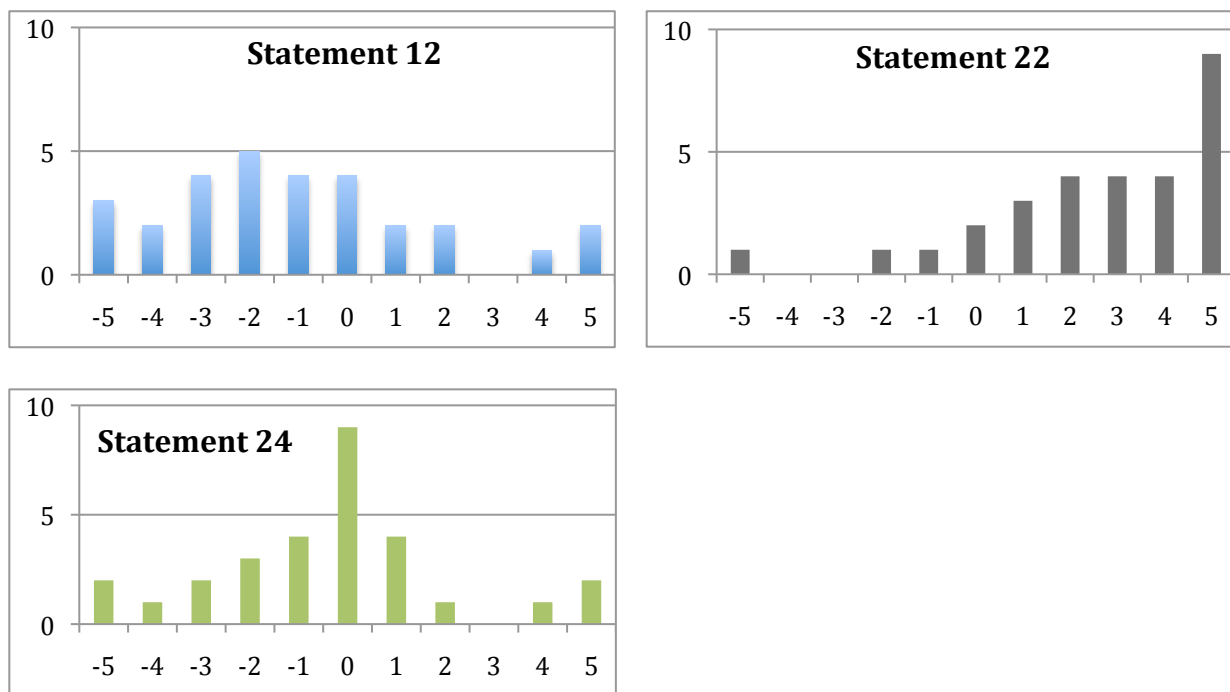
Statements with a large range or spread of scores (maximum = ten) point to major disagreements among study participants. They are important to understand the key sources of contention between different belief systems. Three statements have received scores at both ends of the spectrum (-5 and +5).

- 12. Only a small number of countries with significant GHG emissions are important for climate negotiations.*
- 22. A key element in solving the climate problem is the need for fundamental value change within our societies.*
- 24. God has made us stewards of the Earth, giving us the ability and responsibility to keep the planet healthy.*

Statement 22 was also among the statements with a high level of agreement among participants, which suggests that there is a majority supporting that statement and the opposing belief is an exception. The topic of religion (24) is not very important in the negotiations and consequently the disagreement regarding this statement is not very consequential. One participant commented that the statement was the most difficult to place: "I placed the "God has made us stewards" question into "neither/conflicted" because I don't strongly identify with the concept of

God on a personal level, but worded differently I would agree with this general statement of responsibility in a spiritual context.” Of real importance is the opinion split regarding statement 12—the number of countries that are important for the climate negotiations and the reason for their raised significance. The bar charts below visualize the distribution of scores for these three statements among all participants, showing very different patterns of agreement and disagreement.

Figure 5-2: Patterns of Distribution of Agreement with Statements 12, 22, and 24



Other Statements with a large spread of scores (nine) before factorization and therefore large sources for disagreement are

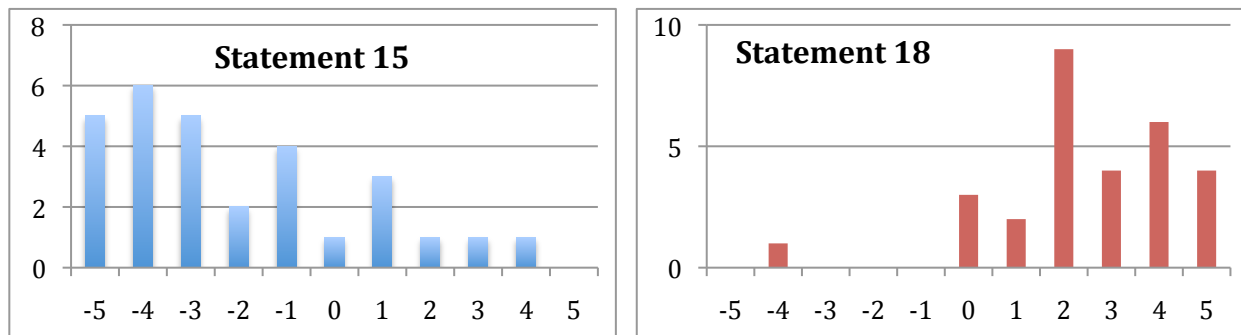
3. *Anti-climate change policies threaten progress and modernity.*
14. *The power disparities between countries in climate negotiations make me very upset.*
15. *The climate problem should be left to the markets.*
18. *Politicians need much stronger voter support and pressure from political movements to create meaningful climate policies.*
32. *Taxes—whether globally or domestically—and other policies that constrain private property rights are simply not politically acceptable in our system.*

- 38. *Economic growth is the best solution to climate change.*
- 41. *I am ashamed that my country is not doing more about climate change.*
- 48. *All states have a moral responsibility to contribute to a global climate solution.*
- 50. *Future generations are likely to be richer and better off than we are, and better able to deal with climate change.*
- 61. *Climate change is not the only issue we have to deal with and other issues are often more urgent.*
- 62. *The focus on winning the next election is the biggest obstacle to finding international agreement.*

The main themes include the role of the state vs. markets and economic growth in addressing climate change, private property constraints as (domestic) policy instruments, and voter support and elections as obstacles to an international agreement. How these statements matter and what types of belief system they support will become clearer in the process of factor interpretation.

It is noteworthy that I list statements 15 and 18 as having both high levels of agreement and disagreement. This indicates that the big group of participants, who assigns these statements similar scores, disagrees significantly with the rest of the study participants. The charts below aid the understanding of this situation.

Figure 5-3: Patterns of Distribution of Agreement with Statements 15 and 18



Scores for statement 15 are much more evenly distributed, with a large majority in disagreement with the idea that climate change should be left to the markets, but also a significant group of individuals, who support the argument. In contrast, all but one individual agree with or are indifferent towards statement 18. A single person creates the large score spread and thereby the

impression that there is major disagreement among study participants regarding the need for stronger voter support for climate change policies.

After factorization the maximum range of scores is reduced to seven, and can be observed for three statements:

- 7. *Climate change was caused by rich, industrialized countries, but its impacts will hurt poor countries most—this asymmetry is unfair.*
- 41. *I am ashamed that my country is not doing more about climate change.*
- 45. *My government is a very constructive player in international affairs.*

Interestingly at this stage beliefs about fairness and national identity—expressed in terms of shame and assessments of constructive attitudes of governments—are the main sources of differences in opinion. Additional statements with a large range of scores (6) include the following:

- 3. *Anti-climate change policies threaten progress and modernity.*
- 12. *Only a small number of countries with significant GHG emissions are important for climate negotiations.*
- 14. *The power disparities between countries in climate negotiations make me very upset.*
- 15. *The climate problem should be left to the markets.*
- 24. *God has made us stewards of the Earth, giving us the ability and responsibility to keep the planet healthy.*
- 38. *Economic growth is the best solution to climate change.*
- 52. *The rich countries have caused the problem; consequently they have the obligation to fix it.*

c. Other Statements With Surprising Scores

Independent of the six factors, the scores for a number of statements offer interesting insights about general attitudes of the Q study participants.

- 8. *Climate change will result in violence and human deaths.*

The highest factor score for this statement is +3, and the average +1.8. Despite the reports of thousands of people dying due to extreme weather events, and the link between extreme weather

events and climate change, the idea that climate change can pose risks to human lives does not (yet) play a major role in the beliefs of many Q study participants.

10. States are the most important players in global climate politics.

Surprisingly, in a group of individuals tasked with multilateral negotiations the highest factor score for this statement is +2; the average factor score a mere 0.5. Twelve individuals assigned this statement a negative score. The highest score (+4) was given by only two individuals; one of them is an NGO representative. Although more than half of the Q study participants represent state governments, who seek to address climate change through cooperative agreements among states, there is only weak support for the idea that states are the most important actors in climate politics.

16. It is best to leave the development of climate solutions to regions, cities, and local communities - they have been much more successful than UNFCCC negotiations.

Participants not only expressed doubts about the role of states, but also dismissed the ability of sub-national authorities to address climate change. This statement received only negative factor scores (-1/-2), but as one participant explained this might not mean that sub-national levels of governance are not important, but rather a problematic framing of the statement: “Whether we should 'leave' climate change to the municipal governments and others, or if we should concentrate 'all resources' on domestic action. Domestic, municipal, city level action is where the real meat of climate change is and where most of the action is, but I can't agree with 'leave it' or applying 'all resources' to them, because the larger context is important for setting the tone and motivation.”

19. The vested interests blocking solutions are too powerful to allow for any meaningful action on climate change.

With an average factor score of +1 and maximum factor score of +2 this statement received less support than I had expected. The weak support might indicate that study participants do not

attribute major importance to the blocking force of vested interests, or that despite the power of vested interests people believe that their resistance can be overcome, in other words, that they are not “too powerful.”

26. Limiting average global warming to 2 °C will be sufficient to prevent major damage.

The factor scores for this statement range from -1 to -3, and the highest raw score is +1, assigned by only one individual. Eight individuals scored this statement 0. This result suggests that there is little confidence that the current temperature goal will be able to achieve the objective of the Convention, raising doubts about the utility of and general support for the goal that goes beyond political declarations. At the same time the scores give very little weight to the following statement:

27. We lack a clearly defined goal for global climate policy.

The highest factor score is +1; the average is -0.2. One could conclude that participants do not consider the temperature goal as sufficiently ambitious, but perceive it as sufficiently clear to guide policy-making efforts.

28. Since the climate is going to change we should be more concerned with adaptation.

There is surprisingly little support for this statement in the data despite growing concerns about adaptation in the media and in academia, and the continuous demands of negotiators from developing countries to allocate more resources to this issue. Only four individuals ranked the statement +5 or +4. The highest factor score is +3; the average factor score is +0.8.

31. Geo-engineering can solve the global warming problem much more cost-effectively than mitigation.

There was a fairly strong rejection of the idea that geo-engineering might offer a more affordable solution to climate change than mitigation. The factor scores range from -1 to -3 (average = -2.3). This is a surprising result given that the geo-engineering literature often emphasizes

that its lower price tag makes this technological pathway so appealing in comparison to economically painful mitigation policies. The argument that geo-engineering might buy more time for mitigation and adaptation elicited generally more agreement.

33. Economic growth and jobs must take priority over climate concerns.

In opposition to popular perceptions of the negotiation rationale of diplomats from developed countries, this statement received negative scores from 90% of Q study participants, which are predominantly from participant groups 4-HELV and 5-MELV. The factor scores are all negative (-2/-3). Only two individuals—NGO representatives associated with Group 4-HELV—assigned positive scores (+1 and +2). Similarly there was fairly strong disagreement among study participants with idea that economic growth offers a solution to climate change.

38. Economic growth is the best solution to climate change.

The factor scores range from +1 to -5 with an average of -2.3.

45. My government is a very constructive player in international affairs.

The scores for this statement reflect the highly contentious character of UNFCCC negotiations and the rather negative self-assessment of individuals who represent governments. The highest factor score is +2. Four factor scores are negative, ranging from -1 to -5.

52. The rich countries have caused the problem; consequently they have the obligation to fix it.

This statement is an expression of the currently dominant interpretation of one of the Convention's most important principles, which has been the source of major disagreements in the climate negotiations: common but differentiated responsibilities (CBDR). This interpretation receives mixed support among study participants. The statement has a large score range (-3 to +5) and an average score of +0.24. The majority of scores (24) range between -2 and +2, and only five individuals strongly support this statement with a score between +3 and +5.

55. I believe that we will find a cooperative solution to climate change. Other issues have taken many years of negotiation, too.

Only one factor score shows significant agreement with this statement of optimism (+3); all others score it either 0 or +1. Generally, participants in the UNFCCC negotiations seem to have only modest confidence in their joint ability to find a multilateral solution.

56. Climate change is a very depressing issue.

Five factors score this statement 0, suggesting that what is often described as threatening information does not affect study participants in the same way it affects citizens, or that many study participants are unsure how to respond to this statement. More generally, emotional statements invoking fear, disappointment, or worry tend to have rankings in the middle of the distribution. On the other hand statements no. 57 and 58, which touch upon a sense of being overwhelmed and fatalism, triggered strong disagreement.

57. Climate change is simply too complex and overwhelming. It is impossible to fully understand, let alone solve, the problem.

58. It is already too late to do anything about climate change.

The factor score range of statement 57 is -1 to -4; that of statement 58 is -3 to -5. Their respective average raw scores are -1.8 and -2.9.

64. I have a hard time imagining the consequences of climate change for my community and my country.

This statement has a very narrow factor score range close to 0 (-1/0). Although the interview data offer evidence that study participants had difficulties imagining worst-case scenarios of the distant future (the year 2080), they generally do not believe that they lack imaginative capabilities regarding their home country.

65. Sometimes gradual processes such as GHG emissions result in sudden, dramatic changes in the environment. The existence of such climatic tipping points makes action even more urgent than previously thought. Avoiding tipping points should become a key climate policy goal.

Although the possibility of climatic tipping points has received growing attention in the scientific community, the issue is not (yet) of high importance in the beliefs of study participants. Factor B stands out, scoring this statement +5. All other factor scores range from +1 to +2. The average raw score is +1.9.

III. SIX FACTORS

Appendix Ch5-5 contains a table with all statements and factor scores.

1. Factor A – The International Community

Table 5-5: Extreme Factor Scores for Factor A

Score	Statement
+5	9. An effective climate solution requires the cooperation of all governments around the world. 22. A key element in solving the climate problem is the need for fundamental value change within our societies.
+4	21. Neither states nor markets nor civil society can solve this problem on their own—climate change is a multilevel problem and requires action at all of these different levels. 29. Adaptation and mitigation are complementary and equally important policies. 42. The BASIC countries (Brazil, South Africa, India and China) should show greater leadership in international climate negotiations. 48. All states have a moral responsibility to contribute to a global climate solution.
-5	6. Climate change is mainly an issue for the developing countries. 38. Economic growth is the best solution to climate change.
-4	4. I do not believe that we will see significant effects of climate change in my lifetime. 12. Only a small number of countries with significant GHG emissions are important for climate negotiations. 13. All our efforts and resources to combat climate change should be concentrated domestically, rather than internationally. 47. Problems that might arise decades from now are not important to me.

Four themes dominate this point of view: the importance of cooperation among all states within the UN, a focus on adaptation, economic growth as a problem rather than a solution, and the character of climate change as a moral problem.

States are the central actors in this belief system. One of the most important elements of climate governance is the cooperation of all governments, strongly opposing the idea that a small group of states could solve the problem. The score of statement 12 (-4) confirms the importance of engaging all governments for these individuals. This is the only factor that singles out the role of the BASIC group, emphasizing that the circle of state actors who demonstrate leadership must grow. One participant commented, “BASIC countries need to commit more to taking action, not just leadership.” Individuals with this view strongly reject the argument that climate change concerns only the developing countries (-5) and that more effort and resources should be allocated domestically rather than internationally (-4). They clearly favor a multilateral approach.

This factor emphasizes that all states have a moral responsibility to act on climate change, locating the reason for cooperation in realm of morality and justice rather than that of economic costs and benefits. The subject of rights and obligations are states and not individuals. Accordingly statement 49 (ethical responsibility of the current generation of voters and politicians) receives a lower score than in any other factor score (+2). However, individuals who hold this state-centered view disagree with the notion that the causal and impact asymmetry between the rich and the poor is unjust (statement 52, -2). This focus on cooperation among all states indicates a strong preference for the UNFCCC as a governance venue and a belief in the primacy of the multilateral level in a multilevel governance system (21).

Emphasizing the equal importance of adaptation and mitigation, individuals with this point of view are concerned about arresting the causes of climate change and dealing with its consequences at the same time. The emphasis on adaptation might signal a strong concern about the impacts of climate change in vulnerable developing countries. Individuals who share this belief find the social impacts of climate change such as suffering from food and water scarcity most worrying (+3). At the same time they expect climate impacts in their own lifetime and care

strongly about events that will occur decades from now (+4). This set of beliefs is accompanied by solid support for climate finance (+3). Combining these convictions, there is a strong sense that climate change will affect our lives in ways that require adaptation, and that it is the moral responsibility of states to prevent future climate-related suffering with investments in both mitigation and adaptation. The comparatively low disagreement with statement 31 (-1) suggests that for this group geo-engineering might be a serious policy option.

Another interesting element of this factor is its strong disagreement with statement 38 (-5), which suggests that these individuals consider economic growth part of the problem rather than the solution. Emphasizing the need for value change within our societies (statement 22, +5) they might argue that a departure from our current growth-based development models is needed and will require a fundamental change in beliefs about the good life, progress, modernity and happiness, which moves away from consumption and materialism. Along the same lines this factor assigns a low score (-3) to statement 15 (The climate problem should be left to the markets.) and an equally low score—lowest among all factors—to the idea that the main costs of climate policy will include the loss of GDP and jobs (statement 36). They consider progress on climate change governance more important than economic growth.

Finally, it is worth noting that statements 1 and 2 received more moderate scores in this factor than in any other (+3 and -2). This might indicate a normalization of these beliefs—they matter but they have become normal in a sense that does not require any emphasis any longer.

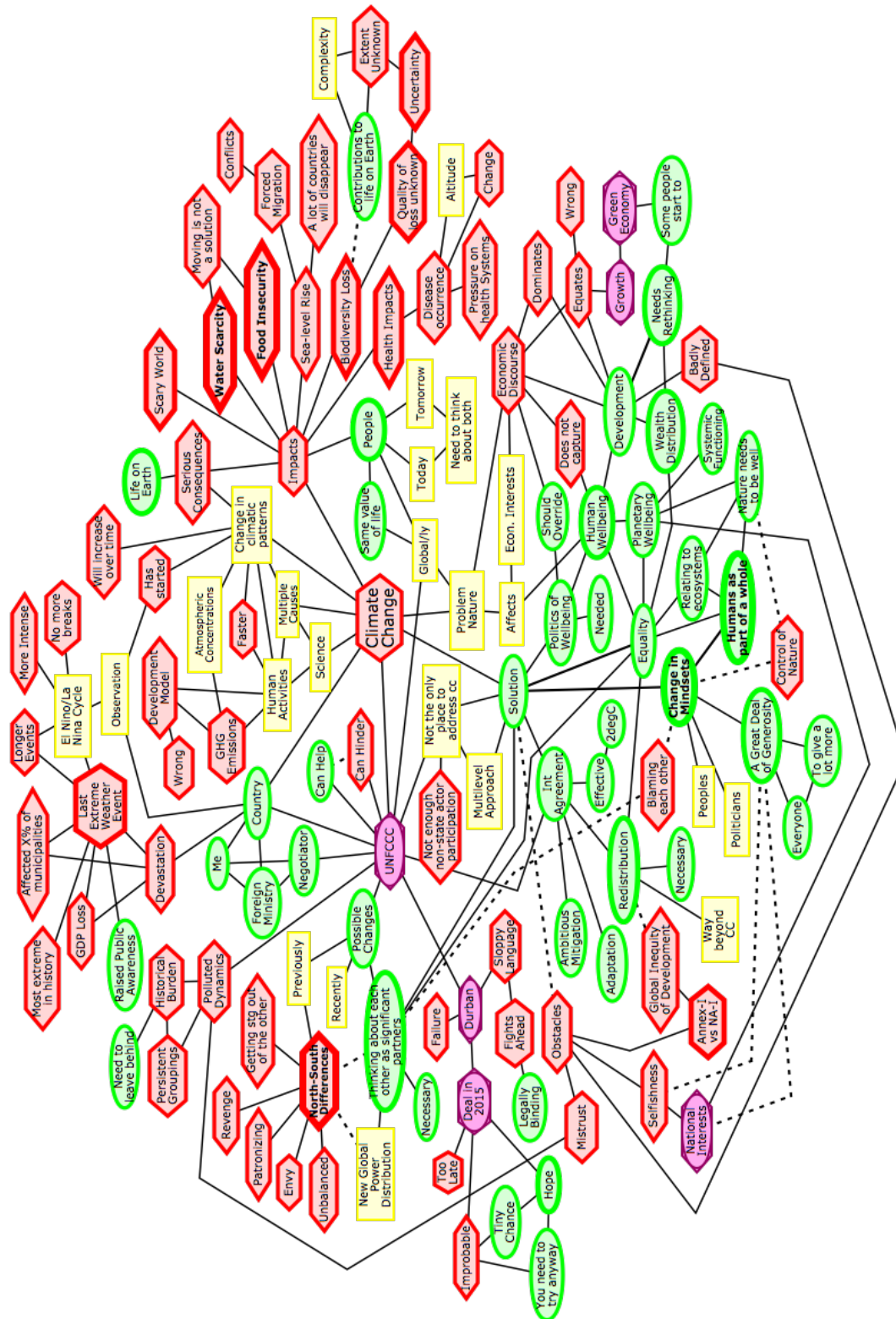
Emotions do not play a strong role in this belief system. Excitement about a cleaner economic future (+3) and disappointment with a lack of environmental concern (+2) are the strongest expressions of emotion. Another interesting observation concerns the higher-than-average scores for statements 57 (Climate change is simply too complex and overwhelming. It is impossible to fully understand, let alone solve, the problem. -1) and 58 (It is already too late to do any-

thing about climate change. -3). This might indicate that this factor has a greater tolerance for admitting the inadequacy and possibly failure of climate governance efforts, although it still signals disagreement with these statements. In line with such a willingness to accept failures and shortcomings, individuals who share this belief system disagree more than others with statement 26 (-3), indicating their dissatisfaction with the current temperature goal (2°C).

Study participants, whose sorts load significantly on factor A, include diplomats in Groups 2-MEHV, 4-HELV and 5-MELV, and members of various non-state actor groups, including a youth NGO and the fossil fuel industry. With the exception of two individuals all of them live in the developed world. More generally the themes of this belief system—centrality of state agency, the primacy of the multilateral governance level, equal weight on mitigation and adaptation, concern about the future and moral obligations of all states—resemble those identified in the CAMs of Group 2-MEHV. Skeptical of today’s model of development, they advocate changing the current way of life and consumption patterns. They also easily identify with identity-groups larger than their own state—humanity or the community of states, which corresponds to the belief that all states have a moral obligation to act, and not just a select few with a special responsibility based on historical emissions or any other measure. The beliefs about state agency in a multilevel governance system also reflect parts of the cognitive patterns identified in the CAMs of Group 4-HELV.

The CAM of the person with the highest factor loading (0.7) is included below. The individual is a member of Group 2-MEHV.

Figure 5-4: CAM of Participant with Highest Loading on Factor A



A number of key concepts—both negative and positive—provide a quick understanding of the key themes of this person’s belief system. The most negative concepts are associated with the expectation of future climate change impacts (upper right), including food and water scarcity. These concerns are based on past and present experiences of extreme weather events in the person’s home country, which have caused major economic damage but more importantly human suffering and displacement (upper left). The second area of strong negative emotions concerns the North-South divide and its counterproductive effect on the UN negotiations (left). The person believes that a solution to climate change (center) has at least three key elements. First, there has to be a change in mindsets (lower center), accepting that humankind is embedded in a larger planetary system of life and needs that support system for its own wellbeing. Second, a change of mind is also necessary to break up the rigid ways of thinking in international politics. North-South differences have to be replaced by thinking about each other as significant partners and treating each other with respect and compassion. Finally a politics of wellbeing should replace the current politics of growth, and an important part of this is greater global equality.

These core ideas are reflected in a version of the narrative *Addressing Historical Grievances*, which emphasizes the idea of one humanity sharing one planet, and advocates bridging the North-South divide with norms of solidarity and helping the poor (see chapter 3 p. 119). While this is a popular narrative in participant Group 2-MEHV, it is not present in the belief systems of Groups 4 and 5.

2. Factor B – A Minilateral Club

Table 5-6: Extreme Factor Scores for Factor B

Score	Statement
+5	1. Human-released greenhouse gases are causing significant climate change. 65. Sometimes gradual processes such as GHG emissions result in sudden, dramatic changes in

	the environment. The existence of such climatic tipping points makes action even more urgent than previously thought. Avoiding tipping points should become a key climate policy goal.
+4	21. Neither states nor markets nor civil society can solve this problem on their own—climate change is a multilevel problem and requires action at all of these different levels. 25. The prospect of a cleaner, eco-friendly economy is exciting. 34. Ideally climate policies would reduce GHG emissions while stimulating economic growth. 49. The current generation (of politicians and voters) has a major ethical responsibility to future generations.
-5	2. I don't trust what scientists say about climate change. 47. Problems that might arise decades from now are not important to me.
-4	4. I do not believe that we will see significant effects of climate change in my lifetime. 6. Climate change is mainly an issue for the developing countries. 24. God has made us stewards of the Earth, giving us the ability and responsibility to keep the planet healthy. 58. It is already too late to do anything about climate change.

Factor B attributes hardly any importance to states at all—among the statements with the highest and lowest scores only one concerns state governments as agents of climate governance. Instead the most important themes include a strong grounding of the belief system in facts and science, a concern about the future and the possibility of climatic tipping points, and a struggle to balance the need to address the climate problem and the need for economic growth.

Ranking statement 1 (+5) and statement 2 (-5) demonstrates that this point of view considers scientific knowledge and factual statements foundational and more important than value-based statements. This strong trust in data finds expression in three additional ways. One is the concern about climatic tipping points, which is currently purely based on scientific theories and publications, but not on observation or experience. Assigning statement 65 score +5 is the most unusual feature of this factor; all other factors rank this statement +1 or +2. In addition to signaling trust in scientific knowledge, this score indicates a concern about the future and a desire for long-term stability and predictability.

The second way in which the factor's preference for facts over values shows is the strong disagreement with statement 24 (God has made us stewards of the Earth, giving us the ability and responsibility to keep the planet healthy.). Rather than ignoring this statement as not useful

or not important (e.g., assigning score 0), it is decisively rejected, which signals strong discomfort with giving religion or spirituality a role in the climate debate.

Third, this factor ranks the need for value change (statement 22) lower than any other factor (0), rendering values irrelevant for addressing climate change. At the same time there are slightly positive scores for statement 62 (The focus on winning the next election is the biggest obstacle to finding international agreement. +1) and the need for greater voter support for climate policies (+2). Presumably voters do not have to change their values, but simply need to understand the problem better in order to make better election choices.

Like Factor A this factor emphasizes that climate change is a multilevel governance problem that cannot be solved by states, markets or civil society alone. People with this perspective do not believe that states are the most important players in global climate politics (statement 10, -1), or that sub-national state actors have the ability to address the problem (-1). Instead of cooperation among all states only a small group of states is sufficient to address climate change at the multilateral level (statement 9, 0; statement 12, +2), presumably to provide a global framework for mitigation. Rather than pursuing negotiations in the UNFCCC, Factor B prefers a club approach. Factor B also agrees more than others with the argument that efforts to fight climate change should be concentrated at the domestic level rather than internationally (-1). Depending on the person's nationality this could be an argument for more ambitious domestic mitigation policy or for the need to push adaptation at home. On the other hand it could be interpreted as a lack of support for climate finance, technology transfer and other international support measures for the vulnerable and poor. Finally this factor disagrees with the argument that elected officials have to protect the interests of the present rather than future generations (-3). This score suggests that elected officials are important agents, who have a major ethical responsibility to future generations (statement 49, +4). To summarize, this is a UN skeptic belief system that advocates a club

approach at the international level and places the key burden of responsibility for climate governance on elected officials in a national political context.

For Factor B the key challenge of climate governance is the reconciliation between mitigation and growth—ideally climate policies would reduce GHG emissions while stimulating economic growth (+4). However, they strongly disagree with argument that economic growth and jobs must take priority over climate concerns (-3). Since statement 33 has a score of -2, growth is not considered to be a solution to climate change or an end in itself, but more like a necessity. In contrast to Factor A, individuals who hold this view do not call for a new development model, but believe in the need for development. They are excited about the prospect of a cleaner economy, but they do not trust the problem-solving power of the markets (statement 15, -2). Their policy goal is a balance between the climate and the economy, and they are likely to support green growth and sustainability concepts. While states are not the most important actors in climate politics, they do seem to have a role in creating the regulatory frameworks that pursue such a balance between emission reductions and economic growth.

Most of the statements with extremely negative factor scores and the statement about tipping points deal with the future. People who hold this view strongly care about problems that occur decades from now, and they expect to experience impacts of climate change in the course of their lives. Despite this perceived relevance and maybe proximity of negative effects of climate change they strongly reject the idea that it might already be too late to do something about the problem. This indicates that they have a sense of agency, or at least believe that actors today are able to prevent future harm, including the occurrence of tipping points. At the same they are fairly pessimistic about the conditions of major change. Statement 20 (Nothing will happen before a climate crisis hits.) has a higher score in Factor B than in any other factor (+1).

With the exception of statement 25 (excitement) emotional statements are not very important for Factor B. There is more fear for their children's future than in other factors (+2), but no uncertainty, disagreement with the idea of being overwhelmed (-3), and no concern about having to explain the failure to address climate change to one's grandchildren (-1), in other words, no personal shame, guilt or responsibility that one has not lived up to.

Study participants with significant loadings on Factor B include members of Groups 2-MEHV, 4-HELV, 5-MELV, 6-LELV, and a youth NGO representative. Members of Groups 4 and 5 are in the majority. The factor shares a number of cognitive patterns with those identified among industry NGOs associated with Group 4-HELV: the extraordinary concern for tipping points combined with fairly long time-horizons, an important role for governments domestically rather than internationally, a preference for market-based approaches but not laissez-faire policies (e.g., establishing a carbon price signal through carbon markets), and the need for greater voter support for officials in favor of climate action. The view that the UNFCCC is less important than the numerous developments outside of it, ranging from small club and bilateral diplomacy to sub-national and NGO initiatives, is prominent among the diplomats in Group 4-HELV. There is also a notable concern about tipping points among the members of Group 5-MELV, both among the diplomats and the environment & market NGO representatives.

Below I include the CAMs of the two individuals with the highest loading sorts on Factor B. The first is a diplomat in Group 4-HELV; the second is a youth NGO representative.

Given the major differences between the CAMs, this comparison highlights the power of Q to identify shared beliefs (underlying factors) that can help to bridge different policy positions.

The first CAM shows a detailed engagement with legitimate sources of knowledge (upper right) and emphasizes why and how future climate change impacts matter for this person: they could lead to war, which is fundamentally opposed to what the individual believes to be in the national interest—a peaceful world, prosperity, and robust (energy) systems. The left side of the CAM reveals a number of reasons why the UN process is perceived as ineffective and unnecessary (e.g., obstructive participants with no abilities or willingness to contribute to the solution, the need to act domestically). The bottom area of the CAM contains concepts about wealth creation and the constraints it places on the speed of social change (i.e., the non-acceptability of wealth elimination or stranded assets).

The second CAM contains numerous references to the future, which is an almost natural focus for a youth representative in the climate negotiations. Again, knowledge sources matter for this person and go far beyond abstract scientific information (upper right). Although the UN is viewed favorably, there is a strong awareness of the importance of domestic policy processes, placing the burden of responsibility on the shoulders of elected decision-makers, and expressing concern about campaign finance and vested interests. Further the person emphasizes the role of individuals and communities in creating the necessary changes.

Neither CAM contains the concept tipping point because the interviews had not highlighted the concept as important. But when the Q sort forced these individuals to rank-order statement 65 they assigned it score +4 and +5 respectively.

The narrative summarizing the themes of the second CAM (*The Global-Local Link*) captures nearly all important elements of Factor B, but integrates the need for value change. Both climate change impacts and the solution to climate change have a global and a local dimension. The

problem severely affects the global poor, but there are also local losses in the developed world. The global solution needs to combine scientific effectiveness (i.e., staying within the 2°C target) and global equity (i.e., allowing developing countries to grow). There are strong links between this global goal and the domestic and even local dynamics. First, domestic politics and electorates can present major obstacles to the global process because their values and positions shape governments’ negotiation positions. Second, value change at the individual and community level can make important contributions to solving the climate problem. Third, the young generation can give voice to the future in the UN process.

3. Factor C – The Market

Table 5-7: Extreme Factor Scores for Factor C

Score	Statement
+5	1. Human-released greenhouse gases are causing significant climate change. 48. All states have a moral responsibility to contribute to a global climate solution.
+4	9. An effective climate solution requires the cooperation of all governments around the world. 18. Politicians need much stronger voter support and pressure from political movements to create meaningful climate policies. 21. Neither states nor markets nor civil society can solve this problem on their own—climate change is a multilevel problem and requires action at all of these different levels. 25. The prospect of a cleaner, eco-friendly economy is exciting.
-5	2. I don’t trust what scientists say about climate change. 39. Investment in climate policies is a poor use of our resources; it makes more sense to do something about poverty, health care and education in the developing world.
-4	6. Climate change is mainly an issue for the developing countries. 13. All our efforts and resources to combat climate change should be concentrated domestically, rather than internationally. 47. Problems that might arise decades from now are not important to me. 58. It is already too late to do anything about climate change.

There are some significant similarities between the extreme scores of Factors B and C (statements 1, 2, 6, 21, 25, 47, 58). But in combination with other statements they provide the foundations for a distinct perspective that emphasizes state cooperation within the UN, links be-

tween international and domestic politics, a strong concern with economic growth, and a personal element that links one's identity with the issue.

Factor C's high scores for statements 1 (+5) and 2 (-5) signal a desire to ground one's beliefs in facts and science, similar to Factor B. However, this factor assigns the highest score also to a strong value statement about the moral responsibility of all states to contribute to a solution (48).

Factor C also emphasizes the multilevel nature of the climate change problem (21). The UN negotiations are an essential part of the solution (9), but they are tightly connected to domestic political processes. The focus on the next domestic election is an obstacle to finding an international agreement. In order to overcome national political constraints, politicians need much stronger voter support and pressure from below (18). Statement 19 concerning the blocking power of vested interests receives the lowest score among all factors (-2). This disagreement could mean that either vested interests are not considered to have much blocking power, or that this power could be overcome with voter support and grassroots pressure.

A third theme is a strong preference for investments in climate policies rather than conventional development aid (39), and for doing so at the international rather than domestic level (13). Combined with the rejection of statement 6 (Climate change is mainly an issue for the developing countries.) this forms a strong argument for global cooperation and a belief that climate change cannot be addressed without some form of global governance. However, this is not a call for international support schemes for poor countries, but the recognition that effective mitigation requires global cooperation.

Factor C shows significantly less concern than others about the social consequences of climate change (statement 5, 0) and about issues related to the North-South divide. The possibility of death and violence as a consequence of climate change (statement 8) receives the lowest of all factor scores (+1); so do unfairness concerns (statement 7, +1). There is slight disagreement with

statement no. 28, which argues for a stronger focus on adaptation (-1), and this is the only factor that does not signal strong support for climate funding (0).

Individuals loading on Factor C believe in the market as a source for solutions more than others (statement 15, +1). They are excited about a cleaner economy (statement 25, +4), and they agree more than any other factor (+1) with statement 38 (Economic growth is the best solution to climate change). Other scores confirm that they use economic frameworks of analysis when thinking about climate change: they support cost-benefit-analysis (statement 35, +2), and they score statement 36 (The main costs of climate change policies include loss of GDP and jobs.) higher than the other factors (0). But at the same time they believe that “the main costs of future climate change can simply not be calculated: the loss of human life, food insecurity, or species extinctions don’t have price tags.” (+2). The relationship between these scores suggests that these individuals’ belief systems are rooted in economic frameworks, but that other values occasionally override or challenge this default mode.

People loading on this factor seem to view climate change as an issue in which they are personally—not only professionally—invested. They dedicate their career to solving climate change (+3), and they express greater optimism than others in the possibility of finding a solution through negotiations (statement 55, +3). They have a strong sense of agency, rejecting the feeling of helplessness (statement 53, -3). They are also the only ones who signal some concern about having “to explain our failure to fix the climate problem” to their grandchildren (+1), connecting agency and future accountability for failure.

This personal angle seems to be linked to a strong national identity. These individuals perceive their own government as constructive players in the negotiations (+1), and they strongly disagree with statement 41 (I am ashamed that my country is not doing more about climate change. -3). They signal more disagreement than others with the idea that the rich countries have

caused climate change and therefore have an obligation to fix it, which strengthens statement 48: All states have a moral responsibility to contribute to a global climate solution. (+5). The moral obligation to act does not seem to be based on any form of causality or historical responsibility, but simply on the global nature of the climate problem. It is possible that this statement was ranked so highly because of its emphasis on all states, rather than on moral obligations. This could reflect a desire to move oneself out of the spotlight of responsibility.

Factor C has unusually strong negative responses to statements that refer to emotions. Apart from the rejection of shame, these individuals emphasize that they are not upset about the power disparities between the rich and poor (-2), and also have the lowest factor score (0) for statement 44 (disappointment about lack of environmental concern). The rejection of helplessness (see above, -3) is coupled with an ambivalent score about the loss of hope (0).

Members of Group 4-HELV, Group 5-MELV and one individual in Group 2-MEHV share this point of view. All except one are diplomats. The patterns identified through factor interpretation match those identified through CAM analysis of members of Group 4-HELV: a focus on the costs of action rather than the social costs of climate impacts, a concern with domestic political constraints affecting multilateral negotiations, a preference for global cooperation combined with confidence in market forces to contribute to a solution (e.g., CDM), and the absence or lack of importance of norms of justice.

The person with the highest loading on Factor C is a diplomat in Group 4-HELV.

Concerns about climate change impacts are severe—more so than the factor suggests—but they are not connected to the person’s home country because “people in my country can deal with the consequences.” The overwhelmingly positive upper left side of the CAM demonstrates that this person perceives global cooperation in the UNFCCC as positive and desirable. Avoiding climate change (center) is in the global interest—the reason why all states have an obligation to contribute to a solution. This can only be achieved through mitigation with the help of market mechanisms—creating a price for carbon and its “externalities.” This CAM contains an interesting line of argument why international cooperation on climate change is in the national interest of the country the person represents (upper left): fostering trade relations with (poorer) neighbors, limiting costly demands for humanitarian assistance and finally a moral responsibility to those “less fortunate than us.”

The CAM combines two narratives: *National Interests trump International Ones* and *The Market*. While expecting grave consequences, mainly for vulnerable populations in developing countries, the focus is on the cost burden of mitigation (i.e., funding the low-carbon energy system transition) in countries seen as major emitters. The preferred pathway of change is domestic legislation that utilizes market mechanisms, for example, cap-and-trade systems, tax incentives, and public infrastructure investment to create a carbon price signal. The basic idea is that actors at all levels—individuals, firms, industries, and states—will rationally respond to incentives that align desirable behavior (emission reduction) with their immediate, economic self-interest.

4. Factor D – Individuals

Table 5-8: Extreme Factor Scores for Factor D

Score	Statement
+5	18. Politicians need much stronger voter support and pressure from political movements to create meaningful climate policies.

	22. A key element in solving the climate problem is the need for fundamental value change within our societies.
+4	1. Human-released greenhouse gases are causing significant climate change. 7. Climate change was caused by rich, industrialized countries, but its impacts will hurt poor countries most—this asymmetry is unfair. 21. Neither states nor markets nor civil society can solve this problem on their own—climate change is a multilevel problem and requires action at all of these different levels. 49. The current generation (of politicians and voters) has a major ethical responsibility to future generations.
-5	6. Climate change is mainly an issue for the developing countries. 15. The climate problem should be left to the markets.
-4	2. I don't trust what scientists say about climate change. 47. Problems that might arise decades from now are not important to me. 50. Future generations are likely to be richer and better off than we are, and better able to deal with climate change. 58. It is already too late to do anything about climate change.

Instead of being concerned with states or market forces, Factor D places heavy emphasis on individuals and their political roles and power to create change. A second theme evolves around fairness and ethical responsibilities among human beings (rather than states). This ethical theme relates to a number of issues, including a responsibility to future generations, the decisive rejection of geo-engineering, and a location of responsibility to address climate change in the developed world. Third, this point of view is skeptical of growth, market forces, and neoliberal policy frameworks.

The two highest scores for statements 18 and 22 express the belief that the key for addressing climate change lies in the values and attitudes of individuals, who have the power—as voters or grassroots organizers—to change the politics of climate change and to influence their government's negotiation position. In line with this focus on individual agency, this factor disagrees with statement 17 according to which individual contributions do not make a difference (-3). Value change at the individual level is the first step towards meaningful climate action at the community, national and international level (see statement 21 for the multilevel nature of the problem), but it is still unclear what values should be discarded and which new ones adopted. The unusually high score (+3) for statement 23 (Based on our shared humanity, our desire for

happiness and security, we can find a solution to the climate problem.) suggests that these might be collective human values like happiness and security rather than individual ones like independence and property. Consequently this factor strongly rejects the power of the markets (statement 15), which cater to and are driven by individual interests in profit and consumption.

Concerns about unfairness in the relationship between the rich and the poor are very prominent in Factor D. In addition to the perceived unfairness of the asymmetry of climate impacts (statement 7), individuals loading on this factor are upset about power disparities among countries in the UNFCCC negotiations (statement 14, +2). This point of view strongly rejects the idea that climate change is a problem for the developing countries only (-5). Leaving the developing countries—in essence, the victims—alone with this problem would be immoral. One could conclude that individuals with this point of view believe that developed countries have an ethical obligation to address climate change. However, the high scores for statements 7 and 49 elevate ethical themes of responsibility among human beings, but not necessarily among states. There is neither agreement nor disagreement with the argument that states are the most important players in global climate politics (0). States matter somehow, but it is individual human beings who experience and are subject to moral duties. In line with this argument the score for statement 48 regarding the moral responsibility of all states to contribute to a solution is positive (+2) but lower than in any other factor. And there is only modest agreement with statement 52 (The rich countries have caused the problem; consequently they have the obligation to fix it., +1).

This ethical framework of thinking about climate change has a number of extensions. The most obvious one is a concern about future generations, who are expected to be worse off than the present generation due to climate change. The belief that the present generation plays a role in diminishing the potential for happiness of future generations adds to a sense of personal responsibility today. This is expressed in at least three ways: disagreement with the idea that prob-

lems that might arise decades from now are not important (-4), fear for one's children's future (+2), and concern about having to explain our failure to address climate change to one's grandchildren (+1). (The scores for statements 54 and 63 are higher than in other factors).

Another extension is a fairly strong rejection of neoliberal ideas that prioritize economic growth (statement 33, -3; statement 38, -3), utilize market forces to address the problem (statement 15, -5) and frame the issue in terms of a cost-benefit analysis (statement 35, -2). Instead Factor D identifies vested interests as a problem (statement 19, +2).

It is possible that this factor's ethical framework and distancing from neoliberal ideas is also linked to its rejection of geo-engineering, either as a cost-effective solution to the mitigation challenge (-3) or even as a tool to buy more time for mitigation and adaptation (-2). There might be an underlying mistrust of technological quick fixes that merely seek to avoid dealing with our generations' ethical responsibilities. Geo-engineered solutions might allow the world to continue on its current economic development path without the value change that this factor has identified as most important for addressing climate change.

There are five emotional statements that receive fairly high factor scores (+2 or +3). These include excitement about a cleaner economic future (25), disappointment about a lack of environmental concern in state and market institutions (44), distress over major environmental change (40), fear for one's children's future (54) and upset about power imbalances in the UN (14). With the exception of fear for one's children's future, all of these are emotional responses to collective states of affair or societal conditions.

The ten Q study participants whose sorts load significantly on Factor D represent all six participant groups. They include diplomats from Groups 2-MEHV, 3-LEHV, 4-HELV, and 6-LELV and NGO representatives from Groups 1-HEHV, 2-MEHV and 5-MELV. Given this diversity of individuals sharing a viewpoint, it is difficult to identify a participant group whose CAM patterns

offer a strong match with the cognitive patterns of Factor D. Rather the factor presents a combination of beliefs that exist across different participant groups.

The view that individuals matter as voters in a two-level game shows up consistently across all six participant groups, among diplomats and NGO members alike. People who believe in the power of voters also tend to emphasize the power of civil society organizations to change voter attitudes, to create the broad public awareness through framing and mobilization that allows governments to take costly climate action and more ambitious negotiation positions in the UN. This focus on individuals and civil society is particularly strong among Group 2-MEHV, representatives of Environment & Market NGOs (Group 5-MELV), and diplomats in Group 6-LELV. The diplomats in Group 2 identify additional ways in which individuals can make a difference: decisions by political leaders and lifestyle changes by consumers. Youth NGO members add another angle to individual responsibility, emphasizing the importance of local and community activities through which people can take care of each other and take responsibility for the environment.

The beliefs of Youth NGO members support two additional features of Factor D: they have a desire to speak on behalf of future generations and are concerned about the implications of climate change for those future generations. They also identify with young people around the world, especially with members of the climate youth movement, emphasizing shared elements of human identity that go far beyond the state.

The idea of shared human values and a human community has a strong influence on the beliefs of Group 2-MEHV, Group 3-LEHV, and Group 6-LELV. They emphasize values like mutual survival, solidarity, and protection of the weakest and argue that ethics should take priority over profits. In their view inaction (regarding climate change) is a moral failure inconsistent with the values of the human community.

The CAM reflects most of the key themes identified for Factor D. Individuals clearly matter, both through community-based action at home (lower-right) and through civil society action (upper-left). Future generations need to be given voice through the youth movement, because decisions today will shape the future. Given the major social impacts of climate change the present generation has a responsibility to address the problem in order to minimize its impact on land and people (present and future). The market and economic growth play no role in this person’s envisioned solution to climate change. The CAM’s narrative—*The Global-Local Link*—emphasizes the multilevel nature of climate change and the importance of individual choices and values within this setup.

5. Factor E – The Developed World

Table 5-9: Extreme Factor Scores for Factor E

Score	Statement
+5	1. Human-released greenhouse gases are causing significant climate change. 7. Climate change was caused by rich, industrialized countries, but its impacts will hurt poor countries most—this asymmetry is unfair.
+4	18. Politicians need much stronger voter support and pressure from political movements to create meaningful climate policies. 21. Neither states nor markets nor civil society can solve this problem on their own—climate change is a multilevel problem and requires action at all of these different levels. 49. The current generation (of politicians and voters) has a major ethical responsibility to future generations. 52. The rich countries have caused the problem; consequently they have the obligation to fix it.
-5	6. Climate change is mainly an issue for the developing countries. 58. It is already too late to do anything about climate change.
-4	2. I don’t trust what scientists say about climate change. 15. The climate problem should be left to the markets. 7. Problems that might arise decades from now are not important to me. 57. Climate change is simply too complex and overwhelming. It is impossible to fully understand, let alone solve, the problem.

The extreme scores of Factor E show major overlap with those of Factor D. The similarities include a heavy emphasis on unfairness, which is even more pronounced in Factor E, a belief in

the power of voters and political movements to influence global climate politics indirectly by creating political pressure on politicians at the domestic level, the ethical responsibility of the current generation of politicians, who must not leave the developing countries to grapple with this alone, and a lack of confidence in the power of the market to solve the climate problem. However, there are a number of significant differences that differentiate these two factors.

First, the argument that the rich countries have an obligation to fix the problem because they have caused it in combination with an emphasis of unfairness suggest that this perspective is about climate justice as many developing country diplomats and members of the climate justice movement define it. Confirming this assumption, the participant with the highest loading on this factor stated that she had assigned score +5 to statements 7 and 52 because “Climate change is a climate justice issue.” This perspective also explains this factor’s strong disagreement with statement 6 (-5). She commented “Developed countries have the biggest share of responsibility in dealing with the problem.” This view is strongly grounded in a distinction between developed and developing countries and allocates responsibility in the developed world. States play an important role, either as perpetrators or victims of injustice.

The high score for the ethical argument in statement 49 is likely intended to emphasize the responsibility of politicians rather than individual voters. This assumption is bolstered by the comparatively low score (+1) for the statement about needed value change within our societies (22), which was one of the most important ideas in Factor D. Factor E deemphasized the role of individuals and civil society as compared to state governments.

Third, Factor E strongly disagrees with the suggestion that climate change might be too complex to understand or solve (statement 57, -5). This score implies a conviction that somebody or some group of actors is capable of solving the climate problem with the knowledge and technologies existing today. The forcefulness of the response to statement 57 indicates a concern that

the rich could use this argument as an excuse for not acting and for shirking their moral obligations.

Fourth, Factor E emphasizes the importance of adaptation and support for the developing countries (statement 28, +3), which is not a strong feature of Factor D. There is also significant support for the argument that economic growth is desirable (statement 34, +3). Given the general views on the differences between the global North and South, the argument in favor of growth might be intended to apply to the developing world only. These individuals reject the idea that growth is be a solution to climate change (statement 38, -3). Further, they strongly disagree with the notion that taxes or other property constraints are not politically acceptable. As one participant commented on statement 32: “The enforcement of property rights is one of the main obstacles to blocked progress on the climate issue - they prevent the transfer of what would be extremely useful and effective technologies, finance, and intellect. ... Since the purpose of politics is to serve society, it should be irrelevant whether this responsibility is politically popular or not.”

Participants who load on this factor include members of Youth NGOs, and Groups 2-MEHV, 4-HELV, and 5-MELV. The strongest match between CAM patterns and the beliefs of Factor E exist for Group 2-MEHV, especially faith & development NGOs: a clear distinction between developed and developing countries, and a justice framework to explain their relationship, historical responsibility as the foundation for the obligation of the developed world to address the climate problem, support for adaptation measures and resource flows from North to South, and a focus on state actors rather than civil society, markets or individuals.

The CAM of the highest loading individual is included below.

The main themes are easily identified: a strong concern for poor people and the injustice done to them through climate change (upper-middle) and the need to lift them out of poverty; the notion of difference between the rich and the poor as the deeper reason of injustice (lower-right); the concept of historical responsibility and the anger about the lack of political will to address climate change among the big emitters (upper right); and adaptation, technology transfer and climate finance as core elements of a climate governance regime (lower-middle).

The narrative capturing the core ideas of this CAM is *Addressing Historical Grievances*, which is based on the fundamental differences between the developed and developing countries, and the overriding priority to overcome these differences (i.e., to make poor people better off), even if that places constraints on the solution to climate change.

6. Factor F – The Irresponsible West

Table 5-10: Extreme Factor Scores for Factor F

Score	Statement
+5	22. A key element in solving the climate problem is the need for fundamental value change within our societies. 49. The current generation (of politicians and voters) has a major ethical responsibility to future generations.
+4	14. The power disparities between countries in climate negotiations make me very upset. 18. Politicians need much stronger voter support and pressure from political movements to create meaningful climate policies. 25. The prospect of a cleaner, eco-friendly economy is exciting. 41. I am ashamed that my country is not doing more about climate change.
-5	45. My government is a very constructive player in international affairs. 47. Problems that might arise decades from now are not important to me.
-4	2. I don't trust what scientists say about climate change. 4. I do not believe that we will see significant effects of climate change in my lifetime. 15. The climate problem should be left to the markets. 50. Future generations are likely to be richer and better off than we are, and better able to deal with climate change.

Five themes characterize this final factor. The most important theme is the need for value change within our—presumably Western—societies as an ethical responsibility of the current

generation to future ones. The future is an important part of this perspective. It is expected to be worse than the present due to climate impacts in one's own lifetime. The third theme concerns the importance of national identity and associated feelings of disappointment and shame about one's government's poor climate action record. The weaker themes include being upset about existing power disparities in the negotiations, which hints at underlying equity concerns and a focus on the North-South divide, and skepticism about the market's power to address climate change.

Value change is at the center of this belief system. When acted upon in elections or in civil society organizations, value change can influence national politics and eventually international negotiations. Participants' comments and CAMs elucidate why value change is so central for addressing climate change and what type of value change people envision. One person explained why statement 22 deserved score +5: "I think a new political wave ... world wide presents a potential to solve the climate problem, and I think that an enhanced understanding of human connectedness as well as ecosystem and earth system sciences play an important role in creating a foundation for principled climate politics. When I think about the need for value change, or "a new story" to define climate politics, I am also thinking about the need to expand collective consciousness (or identify) beyond individual, family, and national borders." The same individual justified the highest score for statement 18: "I do not see it possible to realize significant progress on climate change without a strong mobilization for change and action from local, provincial and national governments. It is necessary for many complementary efforts to unfold at the same time - ranging from market measures, innovation and enhanced communication of science - but if state policies are chosen with the goal of ensuring an elected party's political survival, then it is incumbent on the electorate to demand strong climate policy."

The CAMs of individuals with high loadings on Factor F contain concerns about a growing consumption-orientation of the world, the need to rethink the old development paradigm of the West, including “what we eat, what we produce, and where our ambitions lie,” the need for more community focus, sustainable lifestyles and emotional health rather than “North-American consumerism and entertainment focus,” and a “social conscience shift” in the next generation of voters, which requires “special people” to take risks and leadership. Addressing climate change requires personal change of individuals in Western societies: on the one hand they need to reorient their personal and community lives, on the other they have to exercise their democratic rights and push their societies in a new direction with their votes and political mobilization for climate action. Shared humanity (statement 23, 0) does not play a role in this reorientation.

Interestingly, Factor F shows only weak disagreement with the argument that individual contributions do not make a difference in climate policy. This suggests that individual choices have a limited reach if they are not complemented by actions at other levels of the system. The extreme factor scores do not indicate a strong role for the state or the markets, but a particular set of governments—those of Western, industrialized countries—seems to be at the center of view’s call for action. Opposing the idea that climate change is an issue for the developing countries (-3), believing that all states have a moral responsibility to contribute to a solution (+3), and giving the highest of all factor scores to the argument that states are the most important players in global climate politics (+2), individuals with this perspective focus on the big emitters in the Global North and their responsibility to deal with mitigation. Apart from unfairness concerns (statement 7, +3) issues related to the North-South divide do not have high factor scores. This group is ambivalent about the UN as a forum to create the necessary changes; they have the highest factor score for statement 59: There are moments when I lose all hope that the UNFCCC process can solve this problem. (+2).

Like Factor E this factor emphasizes the importance of the future and is pessimistic about the trajectory of humanity. Future generations are not expected to be better off, and climate impacts are expected to occur over the coming decades (i.e., one's lifetime). Individuals who load on this factor show the strongest agreement among all participants with the idea that climate change will result in violence and deaths (+3). They also show fairly strong agreement with statement 5 (The social consequences of climate change are most worrying: ..., " +2), and disagree with the argument that climate change is just one among many important problems today (statement 61, -2).

While not trusting the market to deal with climate change, individuals with this view are not opposed to the use of market-based mechanisms or to the mobilization of private resources for climate action. One participant commented: "I think climate markets play an important role in solving the climate problem, ... I also believe in the potential for market-based measures to generate revenue to support public goods, such as mitigation and adaptation measures in developing countries, while also removing incentives to pollute. However, I think the scope of the climate problem is so huge that it's solution will not be ushered by market logic, especially when the growth imperative that drives state interests is also closely coupled with carbon emissions."

This is an exceptionally emotional factor. Emotional statements received higher scores than in any other factor (e.g., 14 [upset], 25 [excited] and 41 [ashamed] were ranked +4). Particularly noteworthy is the high score for shame, which has a large score spread (-3 to 4) and an average raw score of 0. This appears to be the only factor that is able to embrace shame as a negative self-referential emotion, facilitated by national identity as the link between oneself and the shameful behavior of the state. These individuals feel ashamed on behalf of their governments, who have disappointed certain expectations or norms of behavior that the person experiencing shame approves of. Other emotions with fairly high scores (+2) are hopelessness, depression, and

disappointment. The perception of climate change as depressing is an exception among the Q study participants; all other factor scores rank this statement 0.

This perspective is shared exclusively by NGO representatives, including individuals in the youth, faith, environment and business communities. No single participant group offers a good match in terms of the cognitive patterns identified in the CAMs and the factor interpretation. This is a perspective that the CAM analysis was not able to identify in its entirety.

The lower-right area of the CAM speaks to the issue of value change and a stronger community orientation instead of consumerism. The importance of the state and national identity are indicated on the left, expressing frustration with current government policies and a belief in the power of civil society activism to shape political outcomes (upper-left). Mitigation plays a much stronger role than adaptation or equity issues related to the North-South divide. Nevertheless, equity and fairness are important themes, as are environmental effectiveness and ambivalence about the role of the UNFCCC.

The narrative for this CAM is the same as for Factor D—*The Global-Local Link*—despite the differences that divide these viewpoints. Another strongly related narrative is *Western Voters have the Power*, which focuses on the potential of voters in Western democracies to bring about policy change through their political activism and support for climate action.

My personal Q sort loads on Factors A (0.51), B (0.41) and D (0.45).

The two tables below summarize the central cognitive themes of all six factors with an emphasis on beliefs about agency, structure, identity, justice, and the special characteristics of climate change, and the emotional patterns.

Table 5-11: Summary of Cognitive Themes

Factor	A The International Community	B A Minilateral Club	C The Market	D Individuals	E The Developed World	F The Irresponsible West
Agency	States in the UNFCCC (especially BASIC)	Small group of states, elected officials	UNFCCC, states, voters	Individuals	States	Western States, voter-consumers
Structure		Two-level game, domestic politics/elections	Two-level game, domestic politics/elections	Domestic politics, elections, vested interests	Two-level game	
Identity	Community of states	National	Individual, national	Humanity	Developed vs. developing countries	National
Justice	Climate change is a moral issue, states are the subject of norms			Fairness and ethics, individuals are the subject of norms, rich vs. poor	Fairness and ethics, North-South equity and wealth distribution	North-South equity
Ideas & Values	New development paradigm, growth and consumption are the problem, value change	Facts and science	Growth and market forces	Value change, shared humanity, community-focus	Poverty eradication	Value change, sustainable lifestyles, voting
Emotions	Excitement, disappointment	Excitement, distress	Rejection of shame, fear for kids' future	Excitement, disappointment	Rejection of overwhelming complexity	Upset, shame, depression
Special Characteristics		Tipping points			Rejection of overwhelming complexity	
Other	Equal focus on adaptation and mitigation; geo-engineering remains an option	Balancing mitigation and growth	Global cooperation on mitigation	Rejection of geo-engineering and neo-liberalism	Emphasis on adaptation, mistrust of market mechanisms	Focus on future generations

Table 5-12: Summary Table Emotional Patterns

EMOTION	FACTOR SCORE										
	-5	-4	-3	-2	-1	0	1	2	3	4	5
(14) Upset				C		B	A	DE		F	
(25) Excited								E	AD	BCF	
(40) Distressed							AF	CD	BE		
(41) Shame			C	A			DE	B		F	
(44) Disappointed						C	BE	AF	D		
(53) Helpless			C	B	ADE		F				
(54) Fear (kids' future)						AEF	C	BD			
(56) Depressed						ABCDE		F			
(57) Overwhelmed		E	BCF		AD						
(59) Hopeless						CDE	AB	F			
(60) Scared (Unknown)					ABCE	DF					
(63) Guilt					BF	AE	CD				

There is broad agreement among the six factors regarding a large number of emotions, although most of the negative emotions received lower scores than I expected (e.g., fear driven by uncertainty about future impacts). Unsurprisingly excitement as the only positive emotion received the most positive scores (+2 - +4). Particularly noteworthy is the near-consensus on statement 56 (Climate change is a depressing issue.), which received score 0 (neither agree nor disagree) in all factors except F. Being overwhelmed by the complexity of climate change is the only feeling with negative scores in all factors, although the strength of rejection differed (-4 to -1).

The factors disagree regarding the statements on being upset, ashamed, and feeling helpless. For each of these emotions the scores of Factors C and F are at opposite ends of the score spectrum, indicating that these two factors have symmetrical emotional patterns.

Factors A and D seem to have very similar emotional patterns. Factors D and E and Factors A and B show a weaker pattern of similarity.

IV. THOUGHT COMMUNITIES

All participants responded to four Yes/No questions to reveal simple and fundamental beliefs about climate change and cooperation. These questions were:

*Do you think climate change is an **important** problem, i.e., among the top five issues global leaders should worry about?*

*Are you optimistic that climate change will be addressed effectively with cooperative international policies, i.e., is it a **tractable** problem?*

*Does your home country have comparatively **high GHG emissions**?*

*Do you expect your home country will be strongly, **negatively affected** by climate change?*

Based on their responses participants can be grouped into six different belief types or thought communities. The following table lists both the number of individuals who fall into each thought community, and which participant groups they belong to.

Table 5-13: Thought Communities

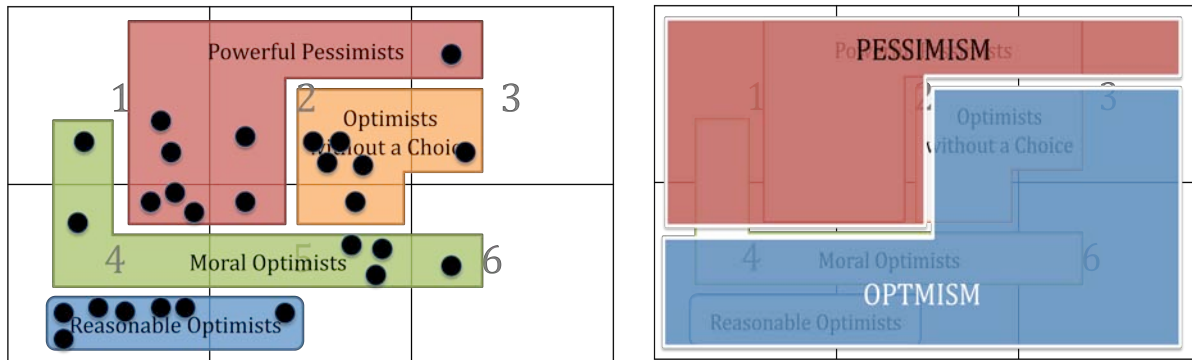
Response Pattern	Thought Community	No. of Participants	Participant Groups
YYYY	Reasonable Optimists	7	4-HELV (6) , 5-MELV (1)
YYYN	Moral Optimists	6	1-HEHV (1), 4-HELV (1), 5-MELV (3) , 6-LELV (1)
YNYN	Optimists without a Choice	6	2-MEHV (4) , 3-LEHV (1), 5-MELV (1)
YNYN / YNYN	Powerful Pessimists	8	1-HEHV (2), 2-MEHV (1), 3-LEHV (1), 4-HELV (3) , 5-MELV (1)
YNNY / YNNN	Powerless Pessimists	1	4-HELV (1)
NYYY / NYYY / NYYN	Negligent Deniers	0	

The largest thought community are *Powerful Pessimists*—individuals from countries with high levels of emissions that have the capability to address the mitigation challenge and to provide the resources to help vulnerable countries deal with impacts of climate change. With one exception all of these pessimists represent non-state actor groups.

Overall the optimists far outweigh the pessimists (68%), with the majority of optimistic diplomats in participant Group 4-HELV. There is a natural match between *Reasonable Optimists* and participant Group 4-HELV, because members of Groups 1 and 4 are nationals of countries with the highest national GHG emission levels and therefore the ability to act on climate change if there is a political decision to do so. The match between *Moral Optimists* and Groups 4-HELV, 5-MELV, and to some extent Group 6-LELV was also expected. Countries with low vulnerability but significant emission levels, who are willing to contribute to a cooperative solution have reasons to be optimistic, but are expected to act out of concern for others rather than themselves. Members of participant Groups 2-MEHV and 3-LEHV tend to be *Optimists without a Choice*—due to their lower levels of emissions they cannot make any significant contributions to global emission reduction efforts, but their high exposure to climate change impacts is indicative of a strong desire to find a cooperative global solution. With the exception of a self-identified *Powerless Pessimist* in Group 4-HELV, and the large number of *Powerful Pessimists* in the NGO community, these response patterns confirm my prior expectations about variables that influence the thought patterns of negotiation participants (national emission levels and vulnerability), and how they do so. They also confirm that the perceptions of participants largely match the measures for emissions and vulnerability I used to establish the six participant groups. The thought communities also match the existing negotiation alliances in the UNFCCC: the *Reasonable Optimists* are all members of the Umbrella Group, the *Moral Optimists* are all representa-

tives of EU member states, and the *Powerless Optimists* are members of the G77 and China, the LDCs and AILAC.

Figure 5-10: Thought Communities and Participant Groups



It is more difficult to establish a clear pattern between thought communities and factors. Table 5-14 shows how many individuals from each thought community load on each factor (e.g., the sorts of two *Reasonable Optimists* load significantly on Factor A). As the table indicates individuals within the same thought community (and negotiation alliance) tend to have very different viewpoints. There are only weak patterns of association between the *Reasonable Optimists* and Factor C (*The Market*), *Moral Optimists* and Factor B, *Optimists without a Choice* and Factor D, and *Powerful Pessimists* and Factor E.

Table 5-14: Thought Communities and Q Factors

	Reasonable Optimists (7)	Moral Optimists (6)	Optimists without a Choice (6)	Powerful Pessimists (8)	Powerless Pessimists (1)
A	2	2	2	3	1
B	3	4	2	2	
C	5	3	1		
D	2	1	4	3	
E	1	1	3	4	
F		1		3	

Different members of the Umbrella Group and of the G77 and China load on factors A to E, and different EU representative load of factors A to D. Factor F can be found exclusively among

NGO representatives. This indicates that the existing negotiation alliances contain individuals with very different points of view, and not in all cases easily compatible ones. Negotiation alliances therefore reflect the current material reality (i.e., levels of emissions and vulnerability), but not the ideational reality of existing beliefs about climate change and multilateral cooperation.

It is important to note that most people's sorts load on two or even three factors, and therefore appear multiple times in the table above. For example, the study participant with ID 6 is a *Reasonable Optimist* and loads significantly on Factors A, C, and E. Consequently ID 6 is included in the count in three different rows in the Reasonable Optimists column.

This raises the question whether there are significant patterns of factor association—if people hold two of the viewpoints identified in the factor analysis, which combinations are possible or even common? Given the small number of participants, the patterns identified here are only weak indicators of all possible combinations and can say even less about the popularity and strength of these combinations in the larger community of climate negotiators. Nevertheless, these are interesting avenues to pursue in future research. Eight factor combinations occurred at least twice, and below I list the four that occurred three times.

- The International Community & The Market (AC) in Groups 2-MEHV and 4-HELV,
- The International Community & Individuals (AD) in Groups 2-MEHV and 4-HELV,
- A Minilateral Club & The Developed World (BE) in Groups 2-MEHV and 5-MELV,
- A Minilateral Club & Individuals (BD) in Groups 5-MELV and 6-LELV.

V. SUMMARY

Although working with the same participants and the same topic, the Q study has offered a very different angle on existing cognitive patterns from the CAM analysis. The method imposes a number of limits and boundaries that enable greater comparability across different individuals'

viewpoints and facilitates a more rigorous comparison. The circumstance that all individuals have to respond to the same set of statements and thus work with limited conceptual resources clearly limits how well participants can express their beliefs. For example, based on the set of statements used, the Q analysis was not able to identify the rich diversity of beliefs regarding the different cost categories linked to climate change revealed by CAMs, or the different identity groups participants associated with it. But this exploratory weakness is balanced by the ability of Q to identify shared viewpoints among participating individuals regardless of their membership in one of the six participant groups, a specific negotiation alliance, or any other formal categorization. A CAM analysis has to rely on artificially created categories like participant groups and is not able to uncover these ‘natural’ groups of individuals who think and feel alike. Given these different strengths and weaknesses both methods complement each other well.

The Q analysis identified six distinct belief systems that capture a large percentage but far from all the variance in the beliefs of the 28 participants. The data set resulted in an exceptionally high number of confounded sorts, which suggests that most individuals hold parts of more than one belief system. This is an indicator of the large complexity of climate change as a global governance issue, but also offers bridges between different viewpoints. The six factors reflect mainly the views of individuals in participant groups 2-MEHV, 4-HELV, 5-MELV, and youth NGO representatives. Important perspectives are not included (e.g., AOSIS, ALBA, LDCs) because of the constraints of the P set.

Some of the factors match the CAM-based cognitive patterns of certain participant groups strongly, for example, Factor A and Group 2-MEHV, Factor B and NGOs associated with Group 4-HELV, or Factor C and diplomats in Group 4-HELV. For other factors such a clear match does not exist. The big advantage of Q is the emergence of natural groups with a shared point of view

that tend to contain individuals from multiple participant groups. The most impressive example is Factor D, which is shared by individuals from all six participant groups and is therefore independent of national GHG emission levels or vulnerability.

Regardless of the factors, all study participants share a number of beliefs concerning the reality of climate change and the trustworthiness of scientists, a concern about the future, an expectation that climate change impacts will occur in their lifetime and a strong conviction that it is not yet too late to address the problem. There is also a shared belief in the multilevel nature of climate change governance, and the need for greater voter support/grassroots pressure, possibly combined with or driven by societal value change, to create the conditions for political action on climate change.

Study participants are strongly divided over a small number of arguments. The question whether all states or just a small number of big emitters are necessary for an effective international agreement pits Factors A and C against Factor B. The need for broad value change within our societies is contested between Factors A and D on the one side and Factors B and C on the other. The ability of market forces to address climate change pits Factors C and F against all others. An issue that is contested among all six factors concerns a moral obligations framework for dealing with climate change rather than a national interests framework. Factors A, E and F favor the former; Factors B, C and D the latter. This reflects the CAM-based finding that some negotiators use a mainly normative decision-making framework, while others apply a rationalist or utilitarian framework to make sense of the problem.

Each of the six factors has a unique cognitive structure, focusing on different actor types, the sources of these actors' respective obligations to act on climate change, the shape their action should take, and the structural constraints they have to contend with, the prospects for success

and the emotions associated with these beliefs. At the center of each belief system is an actor type that grounds, facilitates, and constrains all other beliefs. Without clearly defined actors, it is impossible to think about a problem in terms of threats or opportunities, about obligations or possible actions.

For example, a focus on the international community as a collective actor (*The International Community*) is associated with a cluster of concepts about the identity of this group, for example, concepts about the benefits and disadvantages associated with the growth-oriented model of development that is currently shared by most states, and with an ethical framework that places states at the center. The factor develops solutions for climate change from the perspective of the international community of states, bearing in mind the specific capabilities and constraints of this particular actor group, for example, its ability to create multilateral agreements and its current struggle to overcome North-South differences. At the other end of the possible actor spectrum is the individual, which is the focus of Factor D (*Individuals*). Again, identity concepts and ethical norms focus on the individual as the defining feature of the belief system. Rather than thinking about the community of states this cosmopolitan belief system creates a community of individual human beings around the world. From this starting point, action options and solutions to climate change depend on the ability of individuals (alone or collectively) to influence the political process as voters, consumers or community organizers.

The Market stands out as a belief system that does not include ethical obligations for anybody to address climate change. Although it is a state-centric perspective, there are very few concepts regarding the actor's identity and character—the state as an idea has become so normalized that it does not even require any description. Further, the belief system strongly responds to emotional statements, denying that they (should) play a role in thinking about climate change

cooperation. *The Market* therefore stands out as a non-moral and anti-emotional factor that shares very little with the other five belief systems identified here. At the opposite end of the identity and emotional spectrum (see below) is the belief system *The Irresponsible West*. It embraces negative emotions, even those relating to the person's own national identity, and responds to the climate change based on these negative emotions.

Some factors (B, C, E and F) have a more difficult time defining the relevant actor groups than others (A and D). For example, *A Minilateral Club* advocate a club approach to multilateral cooperation, referring to some, yet unspecified countries, but not all of them. *The Market* uses vague notions of market power and market mechanisms without being able to point to specific actors and specific actions that would address the climate challenge. The picture becomes clearer once the role of the state as a regulator and creator of economic frameworks like cap-and-trade systems is added. Similarly, *The Developed World* has to refer to “the developed countries” or the North-South divide, and *The Irresponsible West* to “the Western countries” to present their point of view. Understanding these perspectives and their actor definitions requires a lot of systemic knowledge and historical-ideational context, for example, the global history of development that allowed concepts like the Global South or Western countries to emerge. This might be a weakness when seeking support for these belief systems among populations who lack such contextual knowledge. Logical coherence is harder to achieve for people who acquire one of these belief systems.

There is broad agreement among the six factors regarding a large number of emotions. Noteworthy is in particular the near-consensus on statement 56 (Climate change is a depressing issue.), which received score 0 (neither agree nor disagree) in all factors except F. Being overwhelmed by the complexity of climate change was the only feeling that received negative scores

from all factors. There are differences regarding being upset, ashamed, and feeling helpless. For each of these emotions the scores of Factors C and F are at opposite ends of the spectrum, indicating that these two factors have symmetrically opposed emotional patterns and are unlikely to offer opportunities for agreement. The other factors do not have such emotional obstacles to reconciliation. F (*The Irresponsible West*) is an emotional outlier does not find acceptance among diplomats, possibly because it embraces negative self-referential emotions like shame.

Feeling in control, in other words, not being overwhelmed by the scale or complexity of climate change and the daunting challenge of designing a functioning governance regime, appears to be an important emotional need in five out of six belief systems I identified in this study. A sense of control is linked to agency and is an important ingredient for defining obligations and tasks of various actors, including oneself or the group one represents. While the majority of individuals maintain a sense of control by simply rejecting a number of concepts and emotions, it is questionable whether control-maintenance is a productive cognitive mechanism. To the extent that control over climate change or the future of humanity is a fiction, maintaining a false belief in control can severely limit the governance options actors consider or the action they eventually take to address the problem. However, none of the six belief systems has been able to use this emotion as a motivator for action and it is unclear how individuals engaged in the global political process should deal with this problem.

Apart from identifying potential synergies and links between factors, it is also important to note fundamental differences between factors D, E and F. All of them contain a strong justice-related element, and one could easily group them under a thematic climate justice umbrella. But they present distinct points of view with varying levels of integration potential with other factors. *Individuals* is a cosmopolitan view of individual responsibilities and a shared humanity—it takes

each person to task and demands action from those who hold the belief. *The Developed World* is the opposite—it refers to groups of states as the most important subjects of rights and obligations, seeing individual negotiators merely as representatives of groups. Study participants who hold this belief tend to identify with the developing world and frame their position as demands of the developed countries (i.e., an out-group). Finally *The Irresponsible West* is about Western responsibility, an indirect form of self-referential obligations—not the individual, but the person’s government is responsible to act and called to action.

CHAPTER 6

Conclusion

Starting with a curiosity about the role of the mind in perpetuating and potentially dissolving the current stalemate in global climate negotiations, this dissertation raised the question what cognitive elements and processes inhibit effective multilateral cooperation on climate change. Deploying two methods new to IR, I explored the cognitive drivers of climate politics by engaging a subset of carefully selected UNFCCC negotiation participants. The project makes several theoretical and empirical contributions to scholarly debates about global climate change politics and about the relationship between major IR theories; it expands the available methodological toolbox of IR; and it offers initial guidance to policy-makers, climate scientists and knowledge brokers regarding the communication strategies needed to help create the conditions for effective multilateral cooperation.

I. THE ROLE OF COGNITION IN GLOBAL CLIMATE POLITICS

This research project has generated three connected sets of theoretical and empirical insights that advance IR scholarship. They concern (i) the nature of cognition and the contribution of a cognitive approach to the study of international politics, (ii) the characteristics of belief systems of political actors engaged in global climate change negotiations, and (iii) the cognitive challenges of these actors dealing with special characteristics of climate change. These insights jointly provide a deep understanding of agency and beliefs about agency within the UNFCCC process.

1. The Nature of Cognition

A cognitive approach to IR emphasizes three aspects of political life that other theoretical perspectives usually ignore: (i) the need to understand how the brain creates meaning, purpose and motivation for political behavior, that is the ideational source of agency, (ii) the relationship between individual and collective beliefs and agency, and (iii) the role of emotion in political thought and action.

Belief systems are cognitive structures that enable and constrain thought and decision-making. People develop these emotionally coherent networks of mental representations in the course of their lives in interaction with other individuals (i.e., the social environment) and the physical-material environment. Meaning making is a relational process that uses language to link physical realities with mental representations and multiple mental representations with each other and to synchronize these connections across multiple individuals (group members). The same mechanism applies to socially constructed entities, including concepts like democracy, border, or identity, but for the absence of a physical entity. Instead the meaning making process relies on symbols, behaviors enacting social facts, conceptual definitions, and other abstract representations.

A central issue for understanding cognition in political processes is the *person-group problem*. Since collective thoughts are no real entities – there is no biological foundation for them in a ‘group brain’ – collective cognition is best understood as a multilevel mechanism that links neural and cognitive processes at the individual level with social processes like communication at the

Elements of a Cognitive Approach:

1. Mental representations linking individual mind to physical or social reality
2. Person-group relationship (collective cognition)
3. The role of emotions

group level. Individuals think of themselves as members of groups; they have mental representations of the group, and thoughts and feelings as group members or even on behalf of the group as an entity. Many of these mental representations are not only inputs for, but also the result of social communication processes. Cognition is a recursive interaction process between individual systems of representation and social networks of cognitive systems.

Finally, a cognitive lens forces the researcher to acknowledge the role of emotion in political decision-making, broadening the set of interacting variables to be explored and challenging the methodological toolbox of IR scholars.

2. The Nature of Political Belief Systems

Linking cognitive theory to IR, I have explored the mental representations in the belief systems of UNFCCC negotiation participants regarding climate change and multilateral cooperation. Taking a step back from the paradigmatic battle between realists and constructivists in IR scholarship, I have offered evidence that both strands of theory make important contributions to the analysis of global climate politics; indeed both are necessary but perhaps jointly insufficient to explain observable political dynamics.

Using the cognitive assumptions of realist and constructivist scholars as an analytic framework to approach the data gathered for this project, I was able to identify three types of mental representations that exist in the belief systems of study participants: concepts regarding structural constraints of agency, group identity, and norms of justice. Two of these concept types occur in all belief systems: concepts about the opportunity/risk structure as assumed by rational choice scholars, in particular the type and hierarchy of expected costs, and concepts about identity groups as expected by constructivists.

The presence of different normative frameworks is a key feature that distinguishes two major types of belief systems. Emotionally driven differences in risk perceptions combined with distinct conceptions of a person's in-group determine whether a belief system is based on rule-based norms of justice (deontology) or on consequentialist considerations. Individuals who expect certain types of costs or damages above a severity threshold of human suffering for their in-group tend to apply a Kantian or deontological framework of reasoning that is often associated with strong emotions. Individuals who are mainly concerned about costs below that threshold, mainly economic and material losses, tend to apply a considerably less emotional consequentialist framework of reasoning. The quality of the expected cost for one's identity group is the decisive factor in differentiating belief systems, splitting the negotiation participants in two major groups: those concerned about the costs associated with climate change impacts and those concerned about the costs of climate policy and action. These two groups do not easily match the familiar categories of developed and developing country representatives. Many negotiators from the developed world share concerns about climate change impacts that trigger normative beliefs about cooperation—it is simply morally right to act collectively on climate change.

Most negotiators associate themselves with multiple identity groups. The state or the organization one represents is central and often the most important collective identity. However, additional groups can complement and even compete with a national or organizational identity. Some belief systems focus on individuals, others on groups of states, and some even on Planet Earth as an all-encompassing identity group that contains humanity and all planetary systems of life. The importance of group identities cannot be overemphasized: they determine which expected costs or structural threats an individual focuses on and consequently shape the entire belief system, including the willingness to commit one's group to cooperation in a multilateral forum. The

larger or more inclusive the group, the more likely are expectations of major climate change impacts. Consequently the likelihood of favoring multilateral cooperation and immediate action increases with the growing inclusiveness of the in-group. National definitions of collective interest contrast with concepts about humanity sharing responsibility for one planetary resource.

Some identity groups referred to by negotiation participants, such as the poor or humanity, are not encompassed by the current rules of the international system, which do not accord them rights and responsibilities. While one might simply dismiss this observation as irrelevant, I suggest that it reveals an important incongruity between the existing understandings of climate change as a global governance challenge and the available multilateral tools for addressing the problem. Some negotiation participants believe, and I concur, that solving climate change requires appealing to collective identities that are commensurate with the scientific problem definition, and consequently involving different groups and categories that are currently not acknowledged in international politics.

The data also pointed to the importance of place identity for understanding beliefs and negotiation positions. Place identities in their great varieties can shape threat perceptions, for instance if physical changes are experienced or expected to occur in locations linked to a collective identity. Emotions play a significant role in this context because they are associated with specific places and anticipating or experiencing the loss of these places causes dread, anxiety, fear, and sadness. Further, place identity changes the relevance and emotional implications of climate-related

Three Key Features of Political Belief Systems:

1. Structural constraints of agency—threat perceptions—and associated emotions
2. Collective identities, especially place identity, and associated emotions
3. Norms of justice (in some, but not others), and associated emotions

extreme weather events. They become tangible, visible traumas to places groups care about—ruining sacred locales—in a way that most of the current policy discourse surrounding extreme events does not recognize. Connecting physical-material structures like territory or land with ideational structures like identity or culture, the concept of place identity not only adds explanatory value but also offers opportunities to bridge realism and constructivism.

To the extent that participants' belief systems contained concepts about applicable norms of justice in global climate governance they are far less contentious than current negotiation positions and political dynamics. The concepts of equity and historical responsibility are not as prominent in the interview data as they are in the negotiation process; very few study participants considered these norms important and appropriate. More important were notions of fairness, caring for the poor, and the idea that everybody should take responsibility to a degree they are able to. This difference between private beliefs and negotiation positions might signal a normative trend away from the contentious politics observable at the moment or indicate that the equity debate is a cover for other interests or concerns. Norms are important, but formal negotiation positions and interventions do not reflect parties' substantive concerns and normative beliefs very well.

These observations speak directly to existing theories in IR scholarship and are to a large extent enabled by those theories. However, this research project generated a number of additional insights that do not fit the existing theoretical categories and boxes as easily.

3. Special Problem Characteristics of Climate Change

Special problem characteristics of climate change affect the belief systems of negotiation participants in multiple ways, but the central insight of this research is that some characteristics and

their governance implications are not sufficiently understood by many negotiators. Major cognitive challenges exist with respect to tipping points and the long time scales of climate change and climate policy.

Based on my empirical findings, I reject the initial hypothesis that the *loss of hope* in response to the pervasiveness of climate change is a significant cognitive process driving the negotiation dynamics. Pervasiveness and the associated uncertainties are acknowledged by most study participants, but often in very general terms that do not reflect a full understanding of these problem characteristics and their implications for climate governance. A specific subset of individuals, especially negotiators from small-island states, occasionally and only temporarily loses hope in the UNFCCC process, but not because of the complexities of climate change. They despair because high-emitting countries decline to act on climate change despite the devastating consequences it will have on small and highly vulnerable countries. They lose hope in humanity, which is distinct from losing hope in the future. More generally, hope prevails among climate negotiators although there are very few rational reasons to be hopeful about the ability of the international community to deal with the problem effectively. The maintenance of unsubstantiated hope allows the political process to continue, but is unproductive in the sense that it legitimizes that process and thus impedes development of alternative processes.

Myopia poses significant cognitive challenges for the negotiation process. However, the cognitive mechanisms associated with myopia apply only to some negotiators, and involve more complicated processes than discounting the future in a rational sense. The uncertainties surrounding climate change and climate policies are not considered an obstacle for action; most individuals are able to develop positions based on their general working knowledge of climate change.

While such a disregard for the specifics might be a problem when it comes to designing policy instruments, it is not an obstacle to cooperation in the first place.

I hypothesized that the *limited observability* of climate change would inhibit cooperation because the lack of experience of climate change impacts limits cognitive access to possible sources of motivation for collective action. This does not appear to be a problem for most negotiators from the developing and emerging world. Most of them believe they have observed climate change already, either directly or indirectly through reports of the citizens they represent. In the developed countries a similar trend is emerging in the aftermath of hurricane Sandy, droughts, floods and wildfires in the US, Europe and Australia. However, negotiators from these countries rarely have a personal experience related to climate change and do not expect to be personally affected in their lifetime.

Limited observability of impacts does affect decision-making in the UNFCCC in conjunction with long time scales and system-response lags. Jointly these factors impair three crucial governance tasks: (i) imagining the long-term future and implications of governance failure, in other words the ability to link (in)action today to possible future outcomes, (ii) developing action timelines, and (iii) setting and acting on goals and targets.

(i) The majority of study participants were not able to *imagine* a non-linear, qualitatively different *future* in which some of the more extreme possibilities of change materialize. Most participants had never encountered this cognitive task before. Their lack of imagination is not surprising—it is a novel challenge for the human brain—but it has an important constraining effect on present decision-making on climate change. If decision-makers do not actively consider the full spectrum of possible futures, either because they lack the cognitive ability to imagine such a distant hypothetical world or because they are not extending the cognitive effort, and if they are

not aware of the causal influence they collectively have over different imagined futures, they are not making fully informed decisions.

(ii) Generally study participants were unable to identify clear timelines for actions or climate impacts, or to link particular actions with particular outcomes on a timescale. Only a subset of negotiators from highly vulnerable countries was focused on timelines prescribed by the scientific community, including a peak year for global emissions and target years for certain levels of global emission reductions (e.g., 80% by 2050). For others, time is not an important variable in the negotiations or in designing governance instruments.

(iii) Not being able to observe or think effectively about the full long-term consequences of climate change also impacts people's thinking about *regime goals and targets*. This study identified three linked, counterproductive cognitive patterns: the absence of a clear definition and shared understanding of the goal(s) of climate governance, a focus on the 2°C target (i.e., the temperature target that is now perceived to be the goal of the climate regime), and the cognitive replacement of the 2°C target with the diplomatic goal of reaching a multilateral agreement at some point in the future. The main reasons for privately abandoning the temperature target include major uncertainties surrounding the science and policy effects, in other words not knowing how to practically reach the target, which diminish hope and undermine belief in agency. The move from a scientifically determined target to a diplomatic one strengthens hope and belief in agency because negotiators have a stronger sense of control over processes that lie within their personal and collective skill set. In essence, there is a disconnect between individuals' assessments of what is politically feasible and what is necessary for environmental regime effectiveness. This mental compartmentalization is linked to feelings of hope and beliefs about agency.

Usually a discussion about the goal of climate change governance starts with a reference to Art 3 UNFCCC and the notion of preventing ‘dangerous’ climate change, and then moves on to the temperature target as a specification of the term dangerous. Much of the scholarly work conceptualizes the 2°C target as a threshold, separating a non-dangerous world from a dangerous one. This study has demonstrated that negotiators do not conceptualize the temperature target as a threshold with the associated need to avoid “going over the cliff” at all cost. Rather than expecting catastrophe beyond 2°C warming, negotiation participants tend to think about global average temperature increase in a linear fashion in the sense that 3°C would be a little worse than 2°C, and a 4°C world would be better than a 6°C world. This linear conceptualization of climate change is consistent with their personal experience so far and is linked to their limited ability to imagine a starkly different long-term future. It is also the result of using temperature as an aggregate measure of multiple complex change processes. But it clearly limits actors’ motivation to seek an immediate cooperative solution.

Of even greater concern than goal selection is the general lack of attention to the possibility of *climate tipping points* among negotiation participants. Rather than dismissing the current importance of tipping points for the governance process (e.g., because of its weak scientific basis), many negotiators are not familiar with the concept at all and do not incorporate tipping points into their negotiation positions or beliefs about climate governance. For example, nobody suggested that preventing tipping points might be a useful governance objective or that tipping points could be

Cognitive Challenges Dealing with Special Problem Characteristics:

1. Unreasonable hope
2. Problems defining productive goals and targets (perceived lack of agency)
3. Lack of imagination regarding the long-term future
4. Lack of attention to tipping points

disruptive for pursuing the goals of the Convention. Despite the quickly growing use of the concept in various scholarly communities, climatic tipping points are not getting much attention in the diplomatic and NGO community.

4. Other Cognitive Challenges

The analysis of belief systems further reveals that the US plays a special role in the climate negotiations, emphasizing a particularly strong link between domestic and multilateral politics. There is an unusually high level of awareness of how the domestic challenges in the US impede the introduction of effective climate policies, which places strong constraints on collective beliefs about agency at the international level. Under the current conditions the US is not able to make a legitimate mitigation promise, which is widely perceived as a condition for an effective international treaty. This unique two-level game setting raises interesting questions for regime theory and seems to counter the argument that regime creation without the hegemon's participation is possible in the case of climate change.

These agency-constraining beliefs regarding US domestic conditions point to two additional problems for global climate governance. First, a number of study participants identified solutions to the climate problem outside the scope and reach of the UNFCCC. Such beliefs are unproblematic to the extent that these solution elements are complementary to the work of the UNFCCC. But some of these proposals—for example, the adoption of a new development model not centered on growth, the mobilization of domestic constituencies including value and preference change, or changing minds of political elites not involved in climate negotiations—could be conditions or independent enablers of an effective multilateral treaty. Since the diplomatic community cannot create these conditions, they severely constrain the community's collective agency in

the sense that progress in the negotiations depends on developments outside of negotiators' control, possibly even outside the control of national governments.

Second, framing US domestic politics as a serious constraint for multilateral treaty making raises the broader question about the relationship between democracy as a form of government and global governance as a means to address global problems. The climate case highlights that democratic opposition to engagement with certain problems can stall global-scale progress, affecting the fate of human beings far beyond the borders of the obstinate democratic country. The national political system in its current form and functions is linked to the (perceived) collective inability (i.e., lack of agency) of actors at the global scale to address climate change. Democracy becomes an obstacle to global governance. This obstructive role is likely to grow more important in the Anthropocene with an increasing number of truly global challenges requiring multilateral cooperative solutions.

5. Six Belief Systems

Stepping back from specific cognitive elements and themes identified with the use of CAMs, the Q analysis offered a glimpse at some of the existing belief systems within the community of climate negotiators, piecing various cognitive elements together into a coherent whole. Due to the limited set of Q study participants, the six belief systems I identified here do not represent the full spectrum of existing views on climate change and multilateral cooperation. But they offer a first in-depth view into the complex cognitive dynamics driving the global climate negotiations.

Almost all study participants share a number of fundamental beliefs, such as those regarding the importance and reality of climate change, trust in science, and the collective ability of the international community to solve the problem. Opinions diverge sharply on a small number of is-

sues, including the question whether all or just a few countries should be at the negotiation table, the distribution of governance tasks between governments and the market, and ultimately the importance and desirability of economic growth.

The key element distinguishing belief systems is actor type: each belief system focuses on a different type or category of actor, a difference that impacts their respective problem definitions, proposed solutions, and political strategies. I briefly summarize the six factors below.

The International Community focus on the collective agency of all states in the UNFCCC, and consider states to be bound by ethical norms rather than national interests. They pay little attention to domestic processes or other factors that might constrain global efforts and negotiation positions. The key challenge is overcoming the North-South divide in order to create a cooperative multilateral solution. The International Community consider growth a problem rather than a solution to the climate challenge.

A Minilateral Club strongly prefer a multilateral club approach to global climate governance, engaging the major emitters only and avoiding the cumbersome and ineffective UN process. Grounding their views in facts and scientific knowledge their long-term perspective gives rise to strong concerns about future climate change impacts, including the possibility of tipping points. Agency and responsibility to avoid climate-related harm lies with elected officials in domestic political contexts, where most of the policy work needs to be done.

The Market is a belief system that links the need for multilateral cooperation among all states on mitigation with the use of market-based instruments to bring about the needed social-economic changes, for instance with a carbon price signal. Climate change governance is a two-level game, and stronger voter support is needed to overcome vested systemic interests. Climate action is a necessity and collective action problem, not a moral issue.

A fourth belief system emphasizes the power of *Individuals* to create change, ranging from individual value change affecting consumption patterns, to local and community engagement and the exercise of democratic rights to vote and to mobilize other people for change. This view dislikes neoliberal policy frameworks. It is grounded in a strong human identity—shared with people around the world rather than fellow-citizens only—and a moral framework of obligations binding the rich and the poor as well as the present and future generations.

The Developed World assigns the responsibility for fixing the climate problem to the developed world for two reasons: historical emissions and present resource wealth, the latter being the base for adaptive capacity. Adaptation and support for the developing countries are key components of a just climate solution, which has to prioritize the needs of the vulnerable developing countries. Scientific information is important to motivate a North-South narrative about past exploitation and present moral obligations to alleviate suffering.

The final belief system, *The Irresponsible West*, focuses on the responsibility of the developed world too. At its center is the need for value change in Western societies as an ethical responsibility of the present generation to future ones. Taking themselves and their own societies and governments to task, these individuals advocate more sustainable, more socially connected, and less consumption-oriented lifestyles. They also express great disappointment and shame about the continuous failure of our societies to address climate change.

All belief systems have a surprisingly similar emotional profile, except *The Market* and *The Irresponsible West*, which have opposing responses to negative self-referential emotions like shame. The former strongly denies the importance of these emotions, the latter embraces them. These two factors stand out in other ways, too. *The Market* is the only belief system that does not

include norms of justice, and *The Irresponsible West* is a belief system that seems to occur exclusively among NGO representatives.

The comparison of *Individuals*, *The Developed World*, and *The Irresponsible West* reveals some fundamental differences that have so far not been noted in the literature. All three belief systems contain a strong justice-related element and could easily be grouped under a thematic climate justice umbrella. But they actually present distinct points of view with varying levels of integration potential with other factors. *Individuals* is a cosmopolitan view of individual responsibilities and a shared humanity—it takes each person to task and demands action from those who hold the belief. *The Developed World* is the opposite—it refers to groups of states as the most important subjects of rights and obligations, seeing individual negotiators merely as representatives of groups. Study participants who hold this belief tend to identify with the developing world, for example individuals with dual nationality crossing the North-South divide and employees of development NGOs, and thereby frame their position as demands of the developed countries (i.e., an out-group). Finally *The Irresponsible West* is about Western responsibility, an indirect form of self-referential obligation—not the individual, but the person’s government is responsible to act and called to action.

Interestingly most study participants share parts of two or three of these belief systems. This pattern indicates that there is large potential for bridging these connected views, possibly integrating currently different beliefs, and building broader or different—hopefully more productive - negotiation alliances. The possibility to create belief change does not imply an argument for belief convergence. Given the complexity of the issue and diversity of views about climate change governance, belief convergence would be not only an unreasonable goal but an unnecessary one. It appears more promising to seek ‘clumsy solutions’ to this wicked problem, which

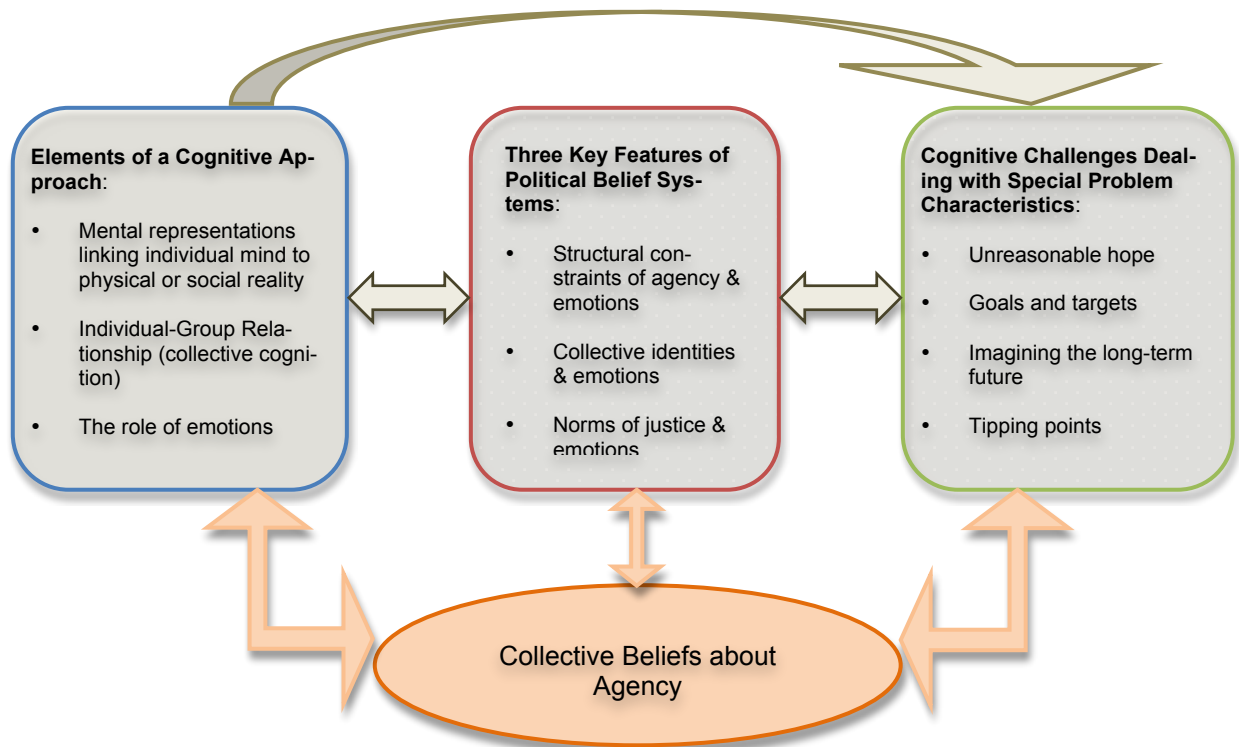
would allow different actors to pursue similar governance goals for very different reasons (Verweij et al. 2006).

Finally it is worth noting that most belief systems are shared by people from very different countries, regions and negotiation alliances, suggesting that their viewpoints are at least to some degree independent of material variables like national emission levels (i.e., cost of mitigation) and vulnerability. The fact that the distribution of beliefs does not match the existing divisions between negotiation alliances is also encouraging for the future of the negotiations.

6. Summary

These three different sets of insights—the elements of a cognitive approach, the cognitive features of political belief systems, and the cognitive responses to the special characteristics of climate change—interact with each other and jointly shape actors’ perceptions of collective agency in the global climate change negotiations. These findings and their interactions are summarized in Figure 6-1 below. The general nature of cognition (blue box) affects the content of belief systems concerning multilateral cooperation and beliefs concerning the special characteristics of climate change. For example, the emotional nature of a person’s climate-related risk perceptions affects her beliefs concerning appropriate governance goals, which is linked to her assessment of the possibilities and likelihood of the international community (i.e., identity group) to achieve these goals, and consequently her sense of hope and agency. The effect on beliefs about agency is mainly negative—it either limits or distorts these beliefs in a manner that makes a cooperative and effective agreement less likely.

Figure 6-1: Three Types of Interactive Insights



II. METHODS FOR A COGNITIVE ANALYSIS

Both methods used in this study—cognitive-affective mapping and Q method—have demonstrated individual and synergistic strengths for a cognitive approach to the study of global climate politics, and international relations more generally.

Interview-based CAMs offer great detail regarding the substantive and structural elements contained in a person’s belief system. Providing deep insights and a visual aid that complement purely text-based analysis, CAMs can improve qualitative work, especially exploratory studies like this one, where categories and causal mechanisms are unknown at the outset. Like every method CAMs are suited for a particular type of studies and have clear limitations, including limited comparability across multiple CAMs, and weak structural analytic capacity without computational support tools.

Q method offered a systematic way to explore collective subjectivity—existing belief systems that are shared by several study participants and likely to be shared by larger groups of negotiation participants. Q’s benefits include more rigor and comparability of viewpoints in comparison to CAM. Revealing shared perspectives is a particularly useful empirical approach for a subject matter as complex and unsettled as multilateral cooperation on climate change at this point in history. Although the set of beliefs identified in this study is incomplete, it offers a useful starting point for in-depth analyses of the current room for agreement and points of contention within the UNFCCC process. The adjustments to the research design aimed at capturing emotional elements of existing belief systems created additional and unique insights. Further expansions, for example, the inclusion of a policy-preference dimension (Niemeyer 2011; Hobson and Niemeyer 2011), might be desirable but not always feasible because in the global negotiation context policy choices are not clear cut and mutually exclusive.

The combination of CAM and Q method offers bridges between the micro and macro scales of subjectivity.

III. POLICY RELEVANCE—DEEPENING UNDERSTANDING AND IMPROVING THE SCIENCE-POLICY INTERFACE

The qualitative findings of this study offer policy-relevant insights in four distinct spheres: multilateral negotiations, national development of negotiation strategies and positions, development of political strategies by non-state actors engaged in the UNFCCC process, and planning and communication efforts of the climate science community.

This study has identified a range of similarities and differences between the cognitive processes of participants in global climate change negotiations, revealing private beliefs that feed the

negotiation process but often remain invisible. Providing insights into the motivating beliefs and values driving different actors, this study can help negotiators gain a better understanding of the negotiation dynamics of which they are a part. A deeper understanding might aid a growing recognition of differences in specific negotiation positions and their resistance to change due to their embeddedness in larger belief systems. Further, acknowledging that the source of contention might sometimes be rooted in the different make-up of individuals' brains and their different cognitive-affective experience of reality may help improve communication and trust among negotiators.

Important issues that divide negotiations parties but are rarely openly discussed include the possibility of a multilateral club approach to complement or replace the UNFCCC and the importance of the multilateral paralysis caused by domestic politics in the United States. The data have also revealed that the equity discussion based on the concept of historical responsibility is thought to play a larger role in the minds of negotiators than this research seems to indicate. Undoubtedly norms and equity are important issues in the negotiations and finding agreement on the meaning of equity in a climate change context is central for moving the process forward. However, the equity debate could be far less contentious if it moved away from the narrow idea of historical responsibility applying to developed countries to a broader notion of responsibility for all countries, which is based on "respective capabilities" and a concern for the poor. The cognitive seeds of change exist because many negotiation parties hold beliefs that permit a more productive equity discussion than the current arguments regarding common but differentiated responsibilities. However, it is unclear whether countries like China or India would be willing to move in that direction.

The beliefs of negotiation participants have also identified a solution space outside the multilateral negotiations, pointing to inherent limitations of the diplomatic process. These solution elements include a major change in the current development paradigm, grassroots mobilization in the United States, and bringing about value change among voters in the developed world. None of these changes can be facilitated with diplomatic tools within the UNFCCC, but some of these might indeed be necessary or at least enabling conditions for an effective multilateral agreement on climate change. These solution elements and their possible links to the negotiations require open discussions, but currently there is no dedicated space or institutional mandate for such a debate.

Taking this cognitive status-quo as a point-of-departure, national policy-makers and non-state actor groups can adjust their own political and negotiation strategies (i) to tailor their messages, offers and demands to different audiences in the negotiation process, (ii) to make a conscious effort to speak to existing concerns and values of other negotiation parties, and (iii) possibly even to seek change of existing beliefs with a focus on creating collective identities with normative attachments to climate change that favor action. Such change efforts can be internal to a group or target another group. They can take place at the multilateral scale or at other system scales all the way down to local communities or individuals.

Finally, this study has provided clues regarding current communication failures at the climate science-policy interface that might help the scientific community rethink its approach to science communication. The lack of attention to the issue of tipping points and the difficulties negotiators have imagining a qualitatively different future place constraints on current regime-creation efforts because they limit the presence of cost-related concepts. These cognitive challenges raise two questions: Why is existing information not being heard or used, and what type of informa-

tion or communication is needed to help policy-makers grapple with the special problem characteristics of climate change? New ways to think about science communication might be needed, including a role for art, visual representations, and stories that engage not only cognitive but also emotional and experiential faculties of decision-makers.

More generally the science-policy disconnect revealed through the analysis of beliefs of negotiators indicates that it might be useful, even necessary, to rethink the current interaction rules and modes of communication between the IPCC and the diplomatic community in the UNFCCC. If current forms of presenting scientific information are insufficient to create beliefs that reflect relevant scientific knowledge, other avenues of communication should be considered.

IV. RESEARCH OUTLOOK—AN EXPANDING FIELD OF COGNITIVE IR?

This explorative study has begun to map the cognitive landscape of global climate change negotiations, offering a partial snapshot of existing belief systems and their effects on political dynamics in the UNFCCC. It is a theoretical and empirical starting point for further work at the intersection between cognitive and political science.

Further work is needed to investigate additional belief systems that have not been captured by this project. A complementary Q study involving negotiators from the emerging powers in the BASIC coalition, AOSIS representatives, ALBA, the LDCs and the Like-minded group would be necessary to create a more complete cognitive map of the global climate governance debate. Further theoretical work is needed to understand the fundamental rules that determine the structure and functioning of these belief systems, most importantly the centrality of actor types and identity concepts and their relationship to the nature of the governance problem.

Going beyond the scope of this research project, future work should explore the nature of cognitive change and the processes that can create different kinds of cognitive change in the particular context of global climate change governance. Linking cognitive change to political behavior and multilateral cooperation in particular might be one of the most important areas of research at the intersection of science and global public policy-making.

This dissertation identified a number of issues that could be relevant for bringing about cognitive change in the minds of climate change negotiators. These issues include the formation and diffusion of beliefs about climate tipping points and cognitive challenges concerning the scientifically informed imagination of the distant future. Future research should investigate what forms of information and communication are needed to help negotiators but also decision-makers and voters more generally deal with these issues proactively and productively. These questions are a concern not only for science communicators, but also for climate scientists, who make important choices about the concepts they use to investigate certain phenomena and to present their findings.

This study has identified a number of ways to advance current theories of agency in the field of international relations. Building on insights from psychology, sociology and cognitive science a political definition of agency should be able to address the person-group problem and be sensitive to the importance of time. Further, my exploration of the role of hope has demonstrated that emotions can play an important role in strengthening or weakening beliefs about agency linked to particular goals and motives, thus creating significant biases not just in the individual mind but in collective processes of selecting governance goals and targets. Awareness of these biases is a first important step towards countering them. That in turn requires greater openness towards

studying emotions and greater methodological creativity to get some empirical traction on these issues.

Future research could also explore to what extent the cognitive patterns of climate negotiators and their impacts on political behavior are relevant for national decision-makers or members of the public. Not all cognitive challenges identified in this dissertation might be relevant for public engagement with climate change. But if they are, further work would be required to identify and address the cognitive mechanisms that currently contribute to phenomena like denial, skepticism, distancing and disengagement.

Finally, and maybe most importantly for the field of IR, I believe there is value in further exploring a cognitive approach as bridging tool between realism, institutionalism, and constructivism. Focusing on cognitive processes can create insights about the types of reasoning, motivations, values and emotions that underlie and drive political processes, about their boundary conditions, and about the role of person-group interactions in inter-subjective meaning making. Interaction rules between structural and ideational theories are likely to be issue specific and identifying them requires further work.

The aspiration of this research project was to identify at least one cognitive obstacle to an effective agreement on global climate change. Finding more than one obstacle, I have argued that the global climate negotiations are stifled by a battle of belief systems that differ fundamentally in their conceptual, especially normative, and emotional make-up. Further, many negotiation participants have major difficulties dealing with the special characteristics of climate change, which reduces their willingness to cooperate and their sense of urgency. The difficulty of integrating scientific knowledge into political positions weakens beliefs about agency and negatively affects the definition of governance goals and targets.

It is possible at this stage of the evolutionary process that human beings lack the cognitive ability to address these novel characteristics of climate change. Given our lack of experience and therefore lack of previous opportunities for learning about the nature of this problem, our mind lacks the appropriate tools—conceptual frameworks and emotional responses—to generate beliefs that can produce proactive, collective solutions. Existing philosophical or moral frameworks are insufficiently developed to address the question of responsibility for humanity rather than individuals, nations or states. The two strongest candidates, utilitarianism and cosmopolitanism, do not address issues of intergenerational justice or the value of planetary systems that enable human life and wellbeing. More generally, Discussions of intergenerational justice at a global scale are still in their infancy (Gardiner 2011) and remain abstract and ungrounded in experience. Economic frameworks have been developed to understand market dynamics over several years, but not decades or centuries. State institutions take a similarly short-term perspective with four- or five-year election cycles. Collective identities have grown from tribes and clans to nations and states, but humanity as the ultimate in-group seems far out of reach and perhaps even impossible. With few exceptions, negotiators’ faculties of imagination and empathy do not reach far enough beyond state borders or far enough into the future to facilitate timely collective action that could slow climate change.

Recognizing these cognitive constraints of global climate change governance is the first step towards overcoming them. Understanding the sources of current differences in negotiation positions based on belief systems could improve mutual understanding among climate negotiators, increasing much needed trust and mutual respect in the negotiation process. The lack of attention to tipping points calls for changes in the science-policy interface, including different means of communicating scientific concepts and engaging negotiators in discussions about their implica-

tions for climate governance. The general inability to imagine the distant future calls for innovative ways to represent, visualize and explore different possible futures both conceptually and emotionally, helping negotiators to understand the ways in which their collective actions make some of these possible futures more or less likely.

If the mind is an obstacle to cooperation, changing minds becomes a political necessity.

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APPENDICES

APPENDIX CH3-1

Limitations of Cognitive-Affective Mapping

Cognitive-affective mapping is a tool that focuses on one specific aspect of human cognition: the relevance of emotions attached to key values that individuals hold with respect to a certain issue. To that end CAMs are highly simplified representations of the relationships of important values and emotions that are not supposed to resemble a neurological structure or process, or any other biological reality. Cognitive-affective maps (CAMs) do not provide a full picture of the mind, or even of the part of the mind that is relevant for the topic under discussion. Other tools and models are more appropriate for more comprehensive representations (and simulations) of the multiple interacting facets of cognition. Given this very specific purpose of CAMs, the tool has a number of important limitations that constrain what can be represented in a CAM and how. The process of generating a CAM based on interview transcripts often runs into these limitations without being able to resolve them fully (e.g., too general information, focus on causality rather than emotion and values, ...). Below I summarize the most relevant limitations and indicate the standard protocol I used when faced with these problems in the course of this project.

1. Different Relationships Between Two Nodes

CAM links can represent very different relationships between two nodes (mental representations), e.g., constitution, causation, correlation, association, (inter) dependence and any form of influence on each other (e.g., to support, increase, strengthen, weaken, limit, decrease, accelerate, damage, ...). The viewer of a CAM who is not the researcher or the research subject sometimes does not have enough information to distinguish the type of link selected, and although much might be inferred from the conceptual context, it is possible that the viewer has to insert his or her own assumptions regarding the meaning of the link, rather than simply 'seeing' conceptual structures. This problem can be addressed by expanding the CAM, adding concepts that differentiate and clarify the relationship.

At least three general types of links are possible, using the representational tools offered by cognitive-affective mapping. The first and most important one is emotional association: if I like one concept, but I do not like the other, I dislike the link between them, which is emotionally incoherent. *This is the default way of representing links.*

Example: Somebody states that climate change is a threat to humanity.

[Climate Change]——[Threat] -----(Humanity)

Since climate change and threat are both negative concepts, their link is emotionally coherent, but the relationship between threat (negative) and humanity (positive) is incoherent.

The second and third types of relationship between two concepts are causal or definitional. There is positive causality (one concept causes or constitutes the other) and negative causality (one concept damages the other). Adding the emotional valences of the nodes creates four different options: (1) two nodes with the same emotional valence have a positive causal

relationship (solid line), (2) two positive nodes have a negative causal relationship (dotted line), (3) a positive and a negative node have a positive causal relationship (solid line), (4) a positive and a negative node have a negative causal relationship (dotted line). Option 1 cannot be visually distinguished from the depiction of emotional coherence and is unproblematic because it matches the emotional information. Option 4 is visually the same like emotional incoherence and is also unproblematic because cognitive and emotional information are aligned.

Example for Option 2:

I would like to have a successful career, but also lots of time with my family.

(Successful Career) ----- (Family Time)

Example for Option 3:

Natural disasters will increase public attention to climate change, which is necessary to change current policies.

[Natural Disasters] ——— (Public Attention)

In this case the causal effect of natural disasters on public attention is desirable and outweighs the emotional incoherence. Alternatively one can depict the concept Natural Disaster as ambivalent.

The CAMs in this study prioritize emotional associations between nodes over causal ones. *However, in circumstances when the available interview data prioritized causal connections, I chose to represent causality when it was necessary to create a comprehensible CAM.*

a. Directionality

CAM networks are undirected, which is one of the major differences to other conceptual mapping approaches. Combined with the problem described above (multiple possible relationships) this can create significant problems for creating and reading CAMs. Depending on the type of relationship between nodes there could be unidirectionality (e.g., causation), there could be mutual constitution (no problem) or there could be different types of links between the same two nodes (e.g., a constitutional relationship in one direction; a negative influence in the other).

The problem of unidirectionality (e.g., Mary loves John.) cannot be resolved given the symmetric links of CAMs. The concept loves would be connected to both John and Mary, leaving the viewer of the CAM unclear whether Mary loves John or John loves Mary. If the conceptual context does not provide the needed clarification, the researcher needs to provide the necessary interpretation.

Based on these concerns it might be useful to distinguish between the character of the local relationship between two nodes, and the character of a larger set of CAM elements as coherent/incoherent. Coherence is an appropriate 'global' descriptor for a macro-level state that emerges from the connections between multiple nodes (a cluster of nodes or the entire CAM), but not necessarily the most appropriate term for the relationship between two nodes.

2. Multiple Representation Options for the Same Thought Structure

Theoretically there are multiple ways of representing the same cognitive structure, which introduces an element of researcher-driven randomness.

Example:

I like peace and dislike war; peace and war are incoherent with each other).

(Peace) ----- [War]

I don't like the absence of peace and I don't like war; both concepts are coherent with each other.

[No Peace] — [War]

Most conceptual relationships can be represented in at least two different ways, using inversion or opposites. Since CAMs do not claim to represent a real mental structure or rules of language processing, this feature of CAMs is not problematic as long the meaning and content of the individual's thoughts are successfully visualized. *The standard protocol in this study was to closely adhere to the language used by the research participant, respecting their choice of concepts.*

a. The Use of Opposites

The last point raises the question to what extent it is useful to include opposite concepts in a CAM. One could argue that opposites are superfluous information, if one assumes that people are logically consistent. This issue is particularly relevant for representing decision-making when the choices are 'Do A' and 'Don't Do A'. The concepts related to each of these decision options might differ although they are merely opposites, e.g., doing A makes me happy and allows me to meet three old friends, while not doing A does not make me unhappy and allows me to hear an interesting talk. Therefore it can be useful to include them both when analyzing a decision-making process.

This study did not map decision-making processes and did not face any problems with opposite concepts.

3. Representing Temporal, Conditional and Normative Beliefs

The key strength of CAMs is their ability to represent the relationships of values, which are related to each other in a time-independent, factual manner – the world as it is (the present state of affairs) from the perspective of the person or group whose views is/are subject of the CAM. It is also strongly suited to displaying a person's worldview or ideology – the system of connected concepts and ideas that tend to be stable over long periods of time and that are independent of the specifics of a situation or policy problem. This descriptive focus on present relationships of values has significant difficulties representing the passing of time (e.g., concepts associated with the past or future and their temporal connection), conditional statements (if-then), indirect beliefs (beliefs attributed to others) or normative beliefs (e.g., 'the rich ought to take responsibility for the poor'). Further, a single CAM is not able to display changes in a person's or group's views over time.

Creating separate CAMs, e.g., the is-world vs. the ought-world, the world in 1997 vs. the

world in 2012, my world vs. my mother's world, could solve some of these issues.

In this study I have compressed all these issues into a single CAM for each study participant, and have indicated temporal differences with separate nodes for years, or a node for 'past' and 'today'. Other problems, esp. normative statements require verbal interpretation.

4. Negation

CAMs are not able to represent negation or negative definitions (i.e., what something is not). A CAM would 'represent' the belief that concept X (e.g., climate change) is not concept Y (e.g., a threat to humanity) simply by the absence of a link between these two concepts.

5. Lack of Data

While CAMs seek to depict the emotional intensity of nodes and the strength of links, interview data does not provide reliable data for these visualizations.

The default procedure for this study was to assign a weight of 1 or -1 for each concept or link, and only add emotional strength when additional indicators in the interview transcript were available (e.g., adjectives like horrible, terrifying, scary).

APPENDIX Ch3-2

Interview Questions

1. What was your role during the UNFCCC negotiations at COP 17 in Durban / COP 3 in Kyoto?

PART 1 – The Nature of the Climate Change Problem

2. How would you summarize the most important and well-established scientific facts about climate change?

3. Which future climate change impacts are you most concerned about? When do you expect “serious” climate impacts to occur? What would that look like?

4. Do you think we are already seeing climate change effects today?

5. Do you think about climate change mainly as a threat to your country’s citizens/organization’s members or others?

6. Do you think about climate change mainly as a threat to people today or future generations?

7. Thinking about climate change as a political rather than scientific issue, how would you describe the nature of the problem?

8. Do you believe it is possible to address climate change effectively? And what does it mean to “solve the climate problem”? Who has the ability to address the problem? How?

9. What is the goal of the negotiations? Is the 2°C target a good goal?

PART 2 – Negotiation Positions and Durban Negotiations

10. When preparing for the negotiations, how do you define your organization’s (national) interest? Did your negotiation preparation contain some form of a cost-benefit analysis?

11. What are the main obstacles to finding an effective international agreement on climate change?

12. Do you think that Copenhagen/Durban was a success or failure?

13. Was Copenhagen/Durban an emotional experience for you? What are the most important emotional situations you remember? How did you feel?

PART 3 – Special Characteristics of Climate Change

14. Are you concerned about climatic tipping points? Does the possibility of tipping points influence how you think about the negotiations?

PART 4 – Imagining the Future

15. Please imagine that all efforts to create an effective multilateral agreement on climate change fail. What would the world look like in a worst-case climate change scenario in the year 2080?

APPENDIX Ch3-3

CAM Feedback Request – Email Template

Dear [Name],

Following up on our interview on [Month/Day/2012] I am sending you a first draft of your cognitive-affective map (CAM) with a few initial comments and questions (below). I also include some simple rules for reading a CAM. I hope you find some time to look at it and send me some feedback. Any corrections or additions you might suggest are very welcome, and I would generate an updated version based on your comments (e.g., are any important concepts missing?).

As I mentioned there is a second part to this study. I include the link to the online Q sort: <http://qsortonline.com/qsort/MMilkoreit2/>. I hope you will find the time to complete it - it complements the cognitive mapping and will enlighten shared viewpoints among participants on climate change and cooperation.

*The sorting exercise will take about 45 minutes. You will NOT be able to save your work and return at a later time, so please make sure you have sufficient time available to go through the whole thing once you get started. Please note that there is no "Go Back" button in the program. **PLEASE, DO NOT HIT THE GO BACK BUTTON ON YOUR BROWSER** throughout the entire exercise! FlashQ will completely refresh and take you back to the first page; you would lose all previous work.*

THANK YOU for taking the time!

Here is a short **guide for reading your CAM**:

- Positive concepts (concepts you feel positively about or that you like or things you would like to see more of) are shown as green ovals.
- Negative concepts (those you feel negatively about or dislike) are red hexagons. (There is not further distinction regarding the type of good or bad feelings associated with a concept, but there are different levels of emotional intensity, indicated by thicker or thinner lines of the ovals or hexagons).
- Neutral (non-emotional) concepts are yellow rectangles.
- Ambivalent concepts are purple, overlaying a circle and a hexagon (this means that in some contexts this is a positive concept for you, in others it's negative).
- Solid line means two concepts are mutually supportive (often linked by causality or logic).
- Dotted line means two concepts are in conflict or incompatible with each other, or that you do not like their connection.

One thing to think about is whether I used the **appropriate emotional valences** for the concepts, esp. ambivalent ones. For example, I am wondering whether I correctly identified

the ambivalent concepts in your map (e.g., [Concept X]). Please indicate where I got it wrong. Maybe you can also tell me, which of the concepts are most important to you (i.e., should have thicker edges than others). At the moment I think that [Concept Y] is among the most important concepts for you.

There are significant **limitations** to this exercise and I am sure you will notice them. First of all, space limitations make it very difficult to connect all concepts appropriately, and the CAM gets very complex very fast given the complexity of the subject matter. I had to simplify a lot, which means that some things we talked about do not show up in the map. This is a pure judgment call. If you consider some missing concepts very important for making sense of the problem, please let me know and I will insert them.

A few **initial observations** (none of this is new for you, but this is a good way to check whether I understood you well):

- ...
- ...

I look forward to your comments! And please let me know if you have any questions.

Best wishes,
Manjana

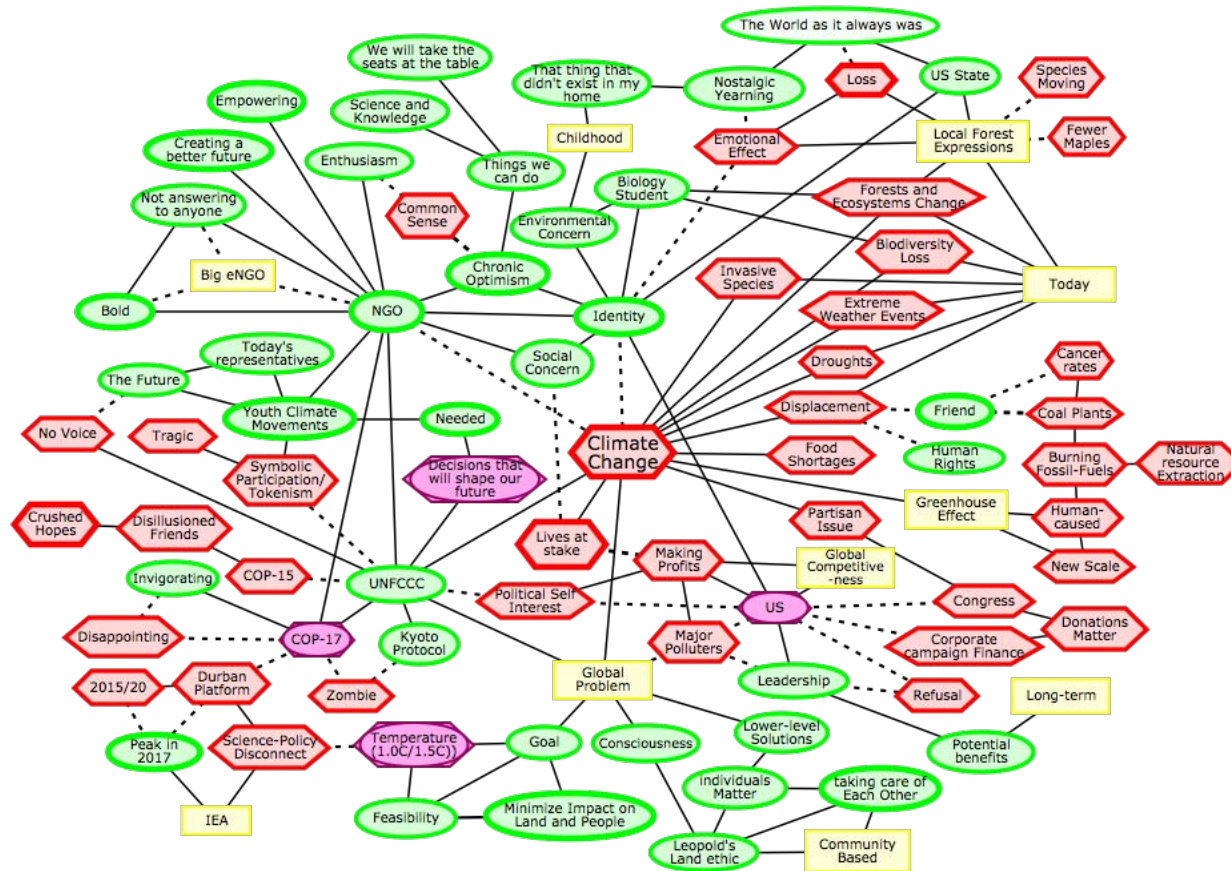
Manjana Milkoreit
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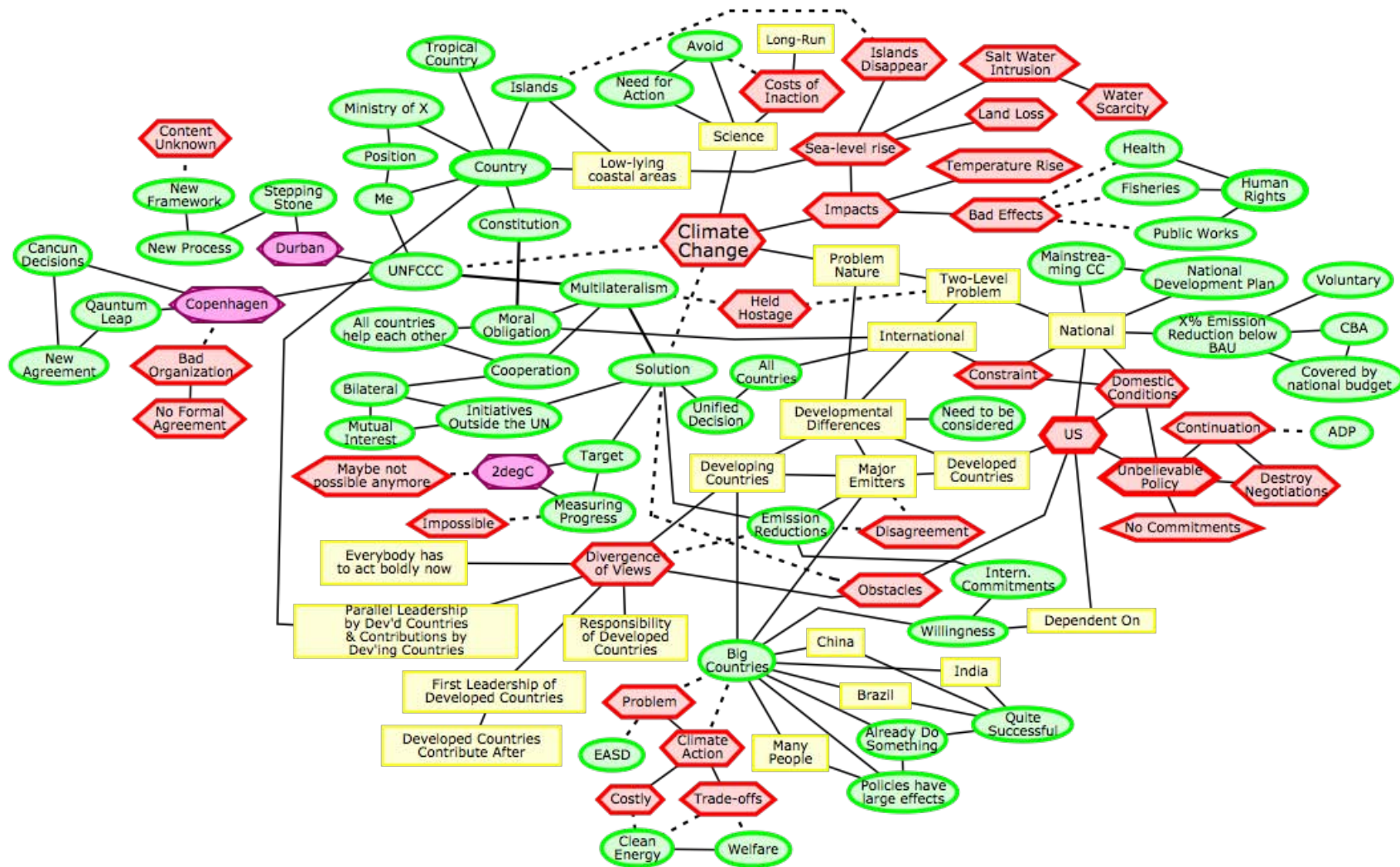
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manjana@mac.com
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APPENDIX Ch3-4

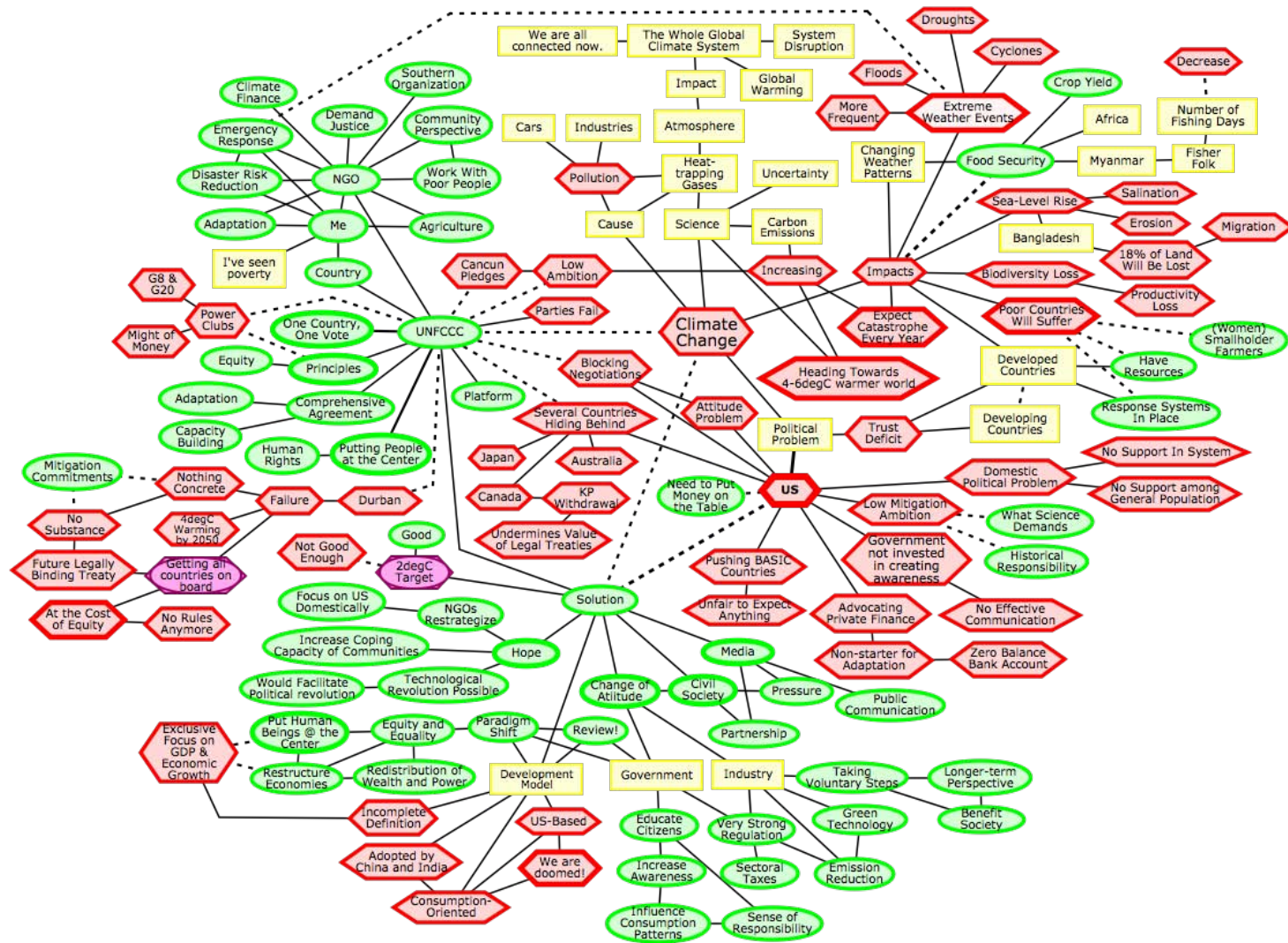
Cognitive-Affective Maps of 55 Study Participants (Anonymized)

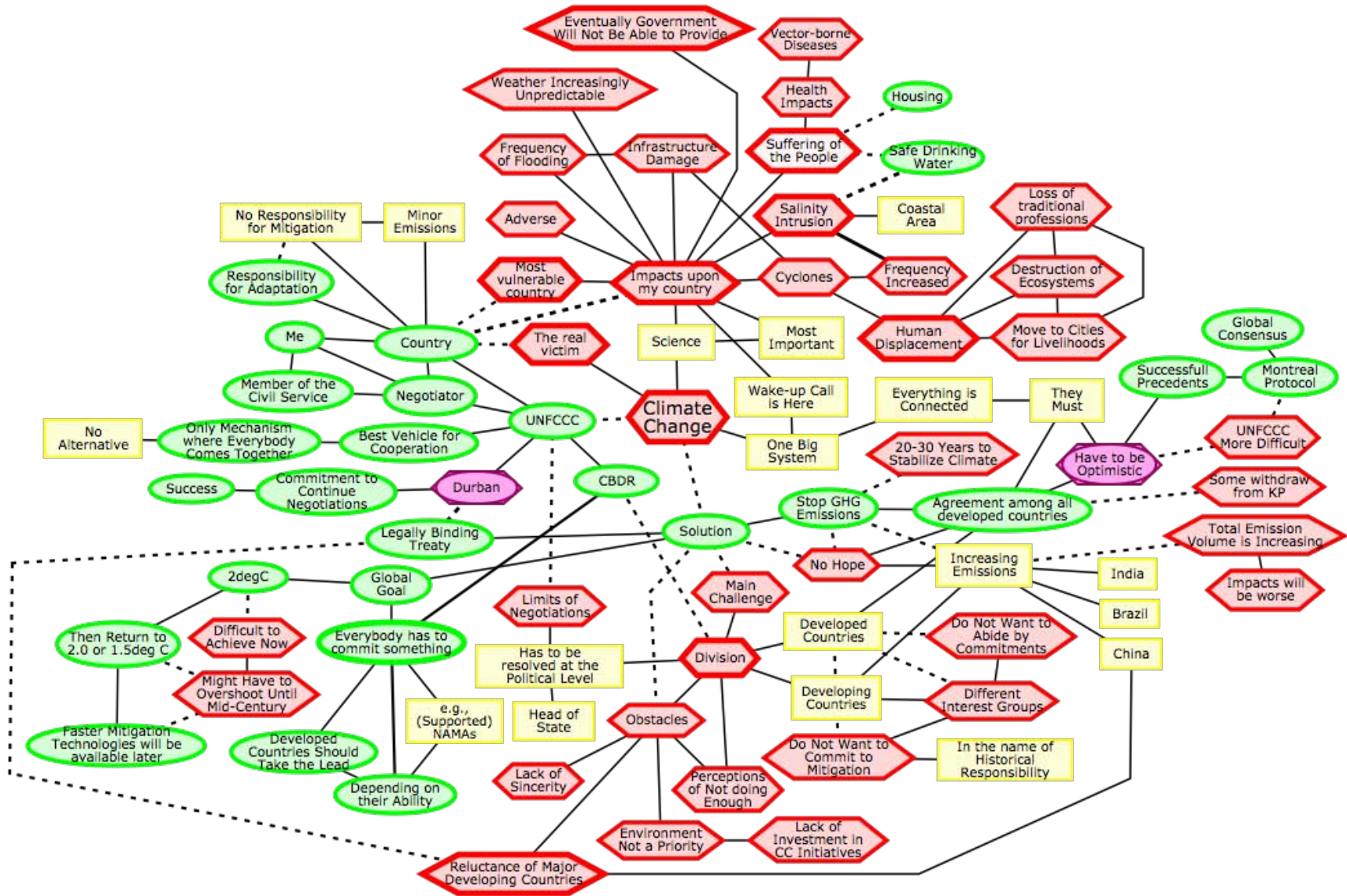
GROUP 1-HEHV & Youth NGOs

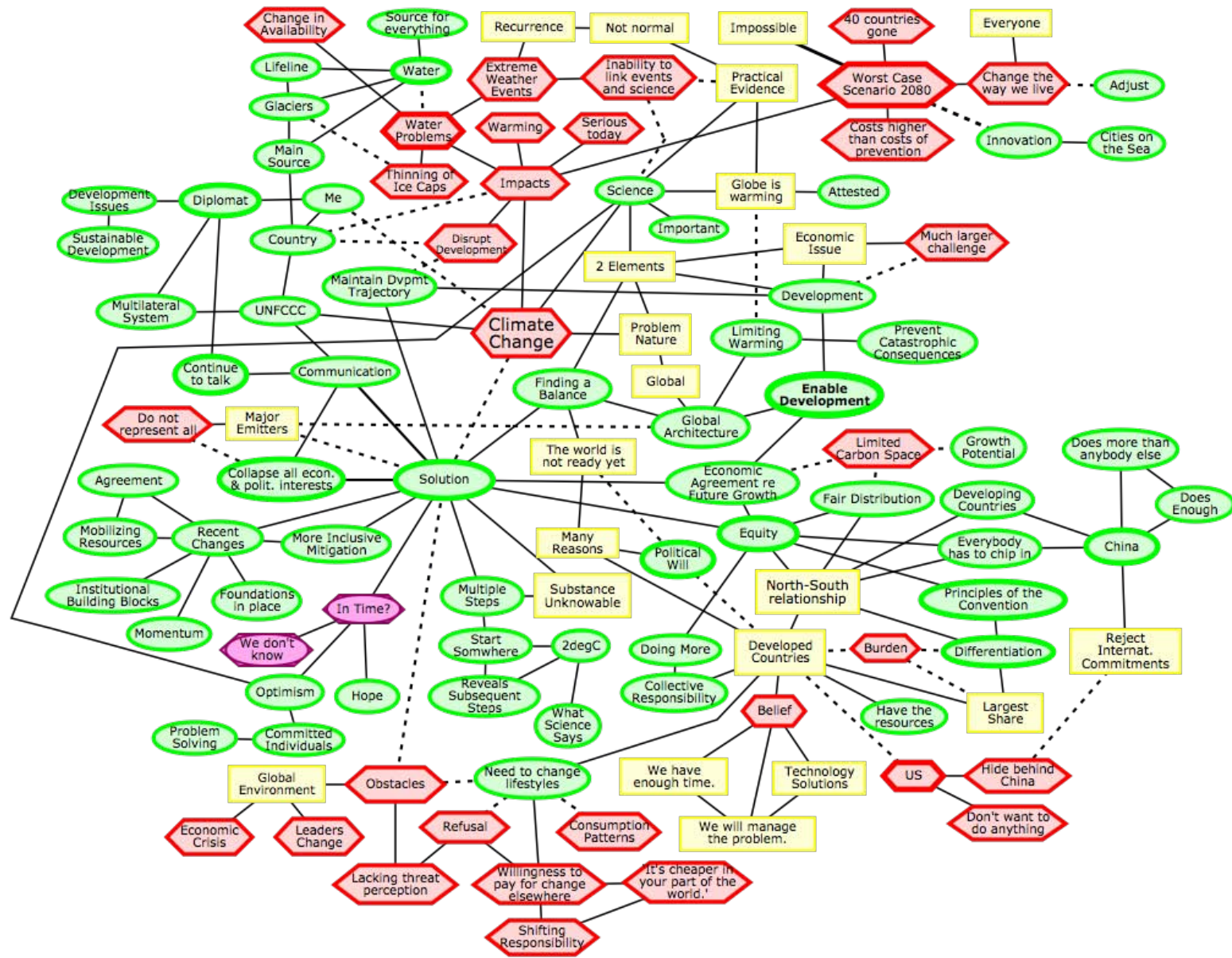


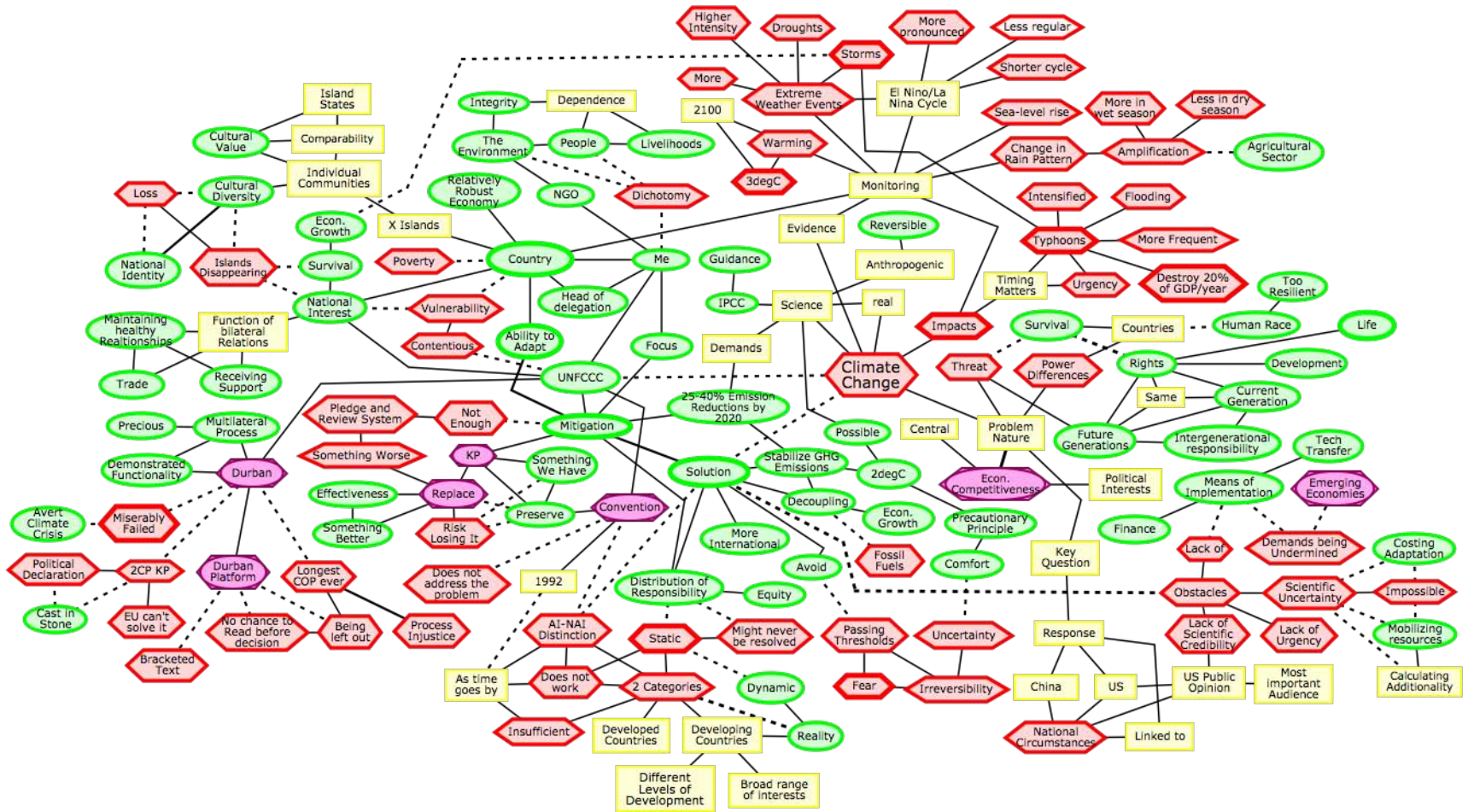


GROUP 2-MEHV & Faith and Development NGOs

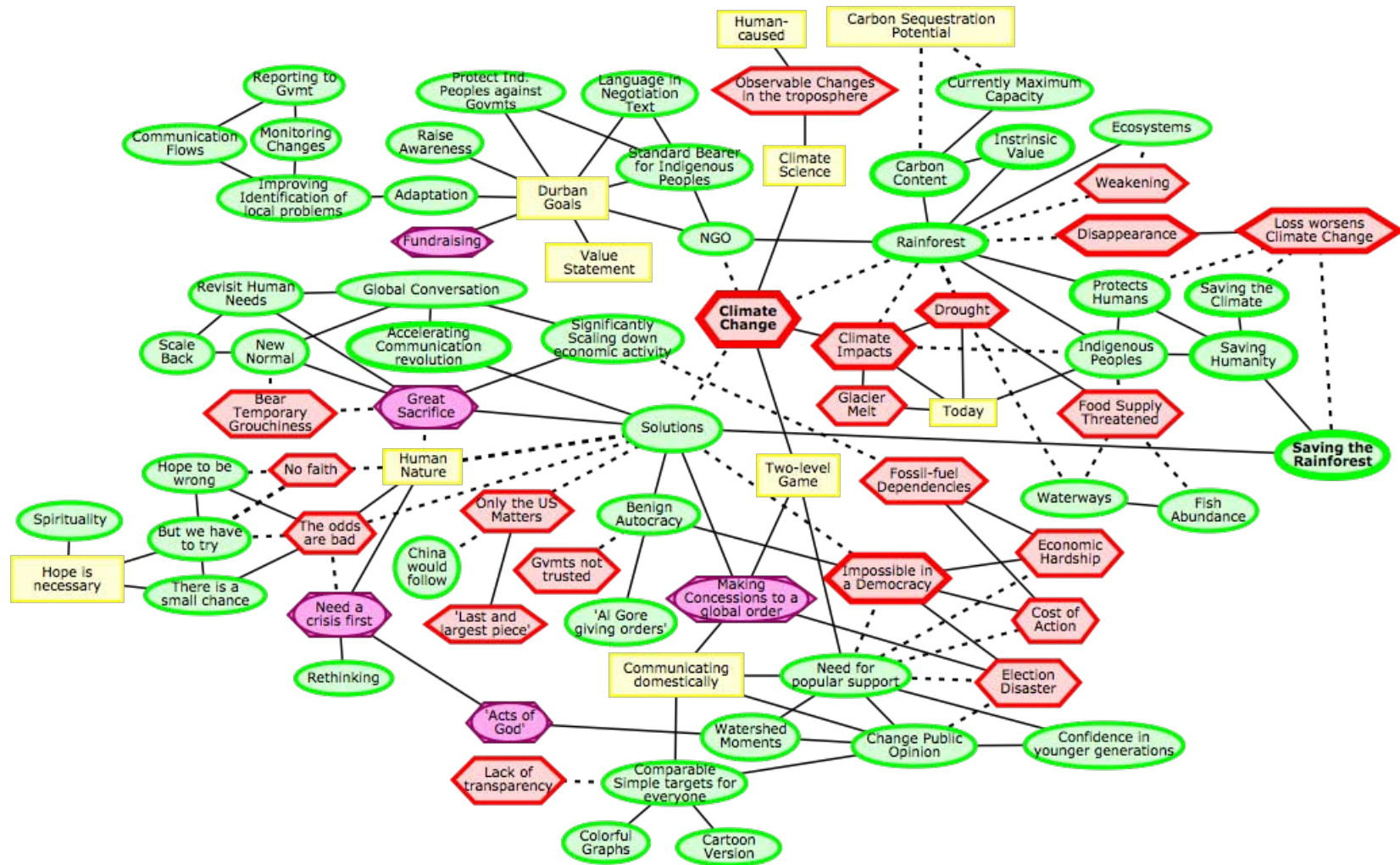


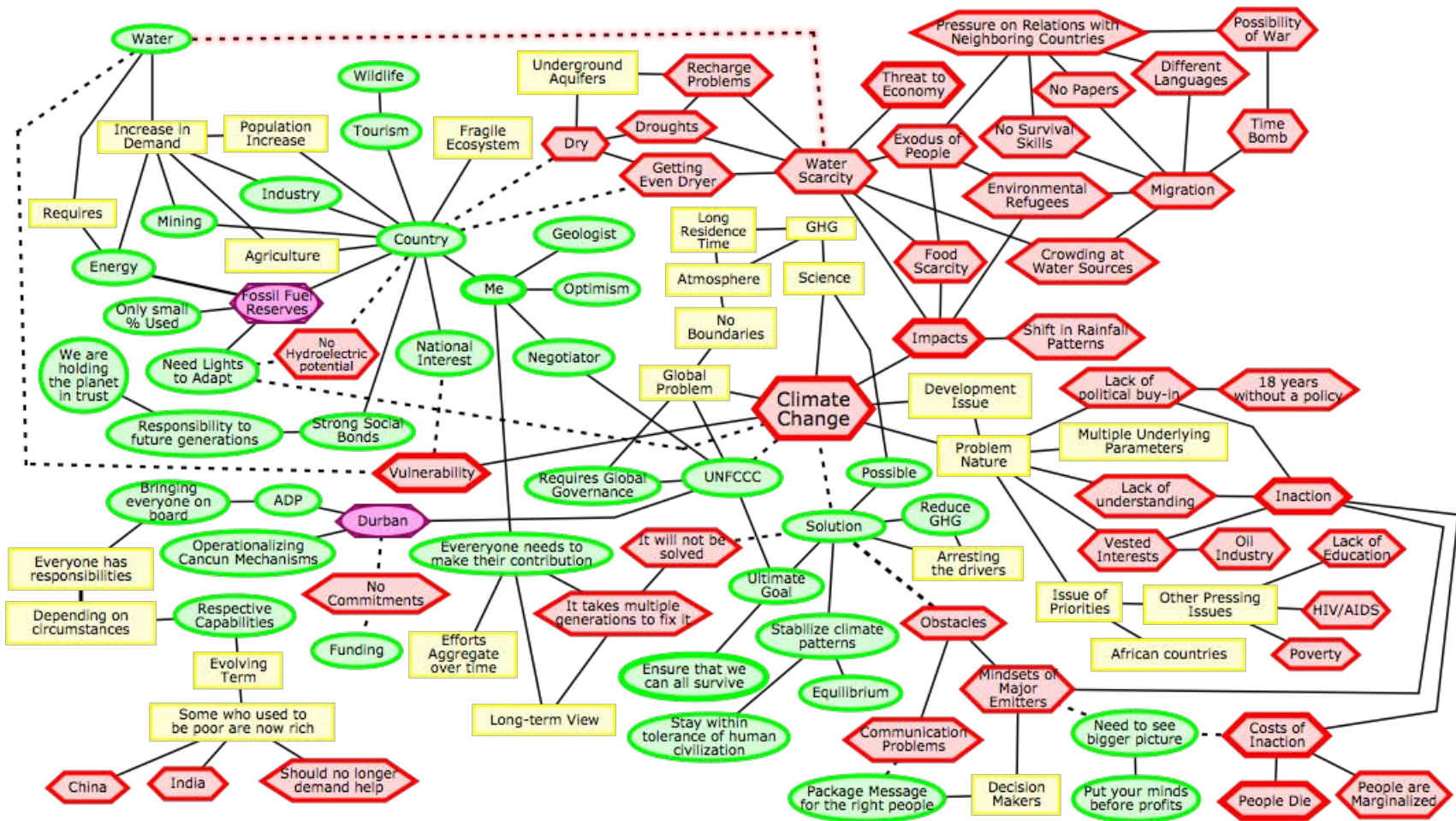


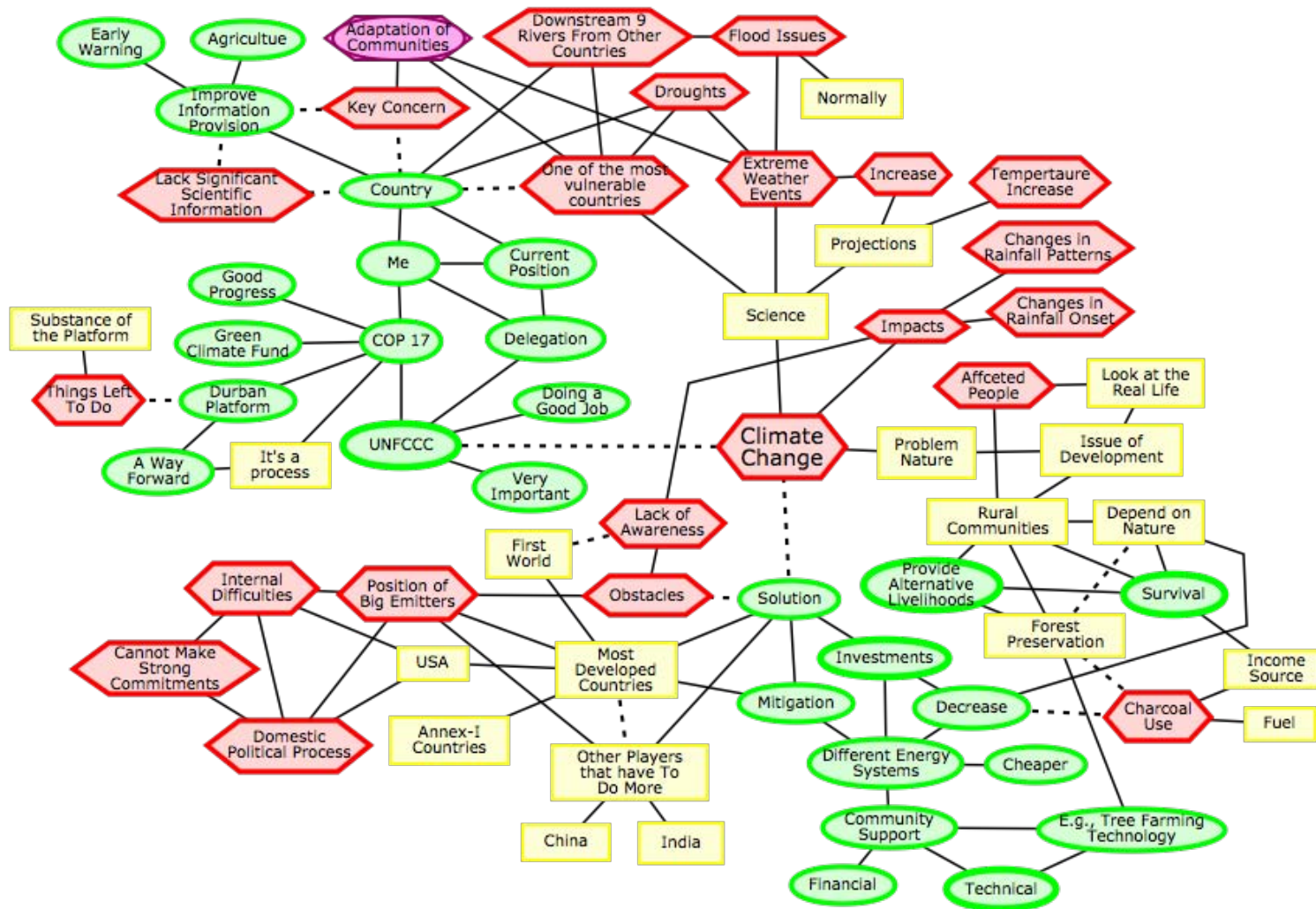


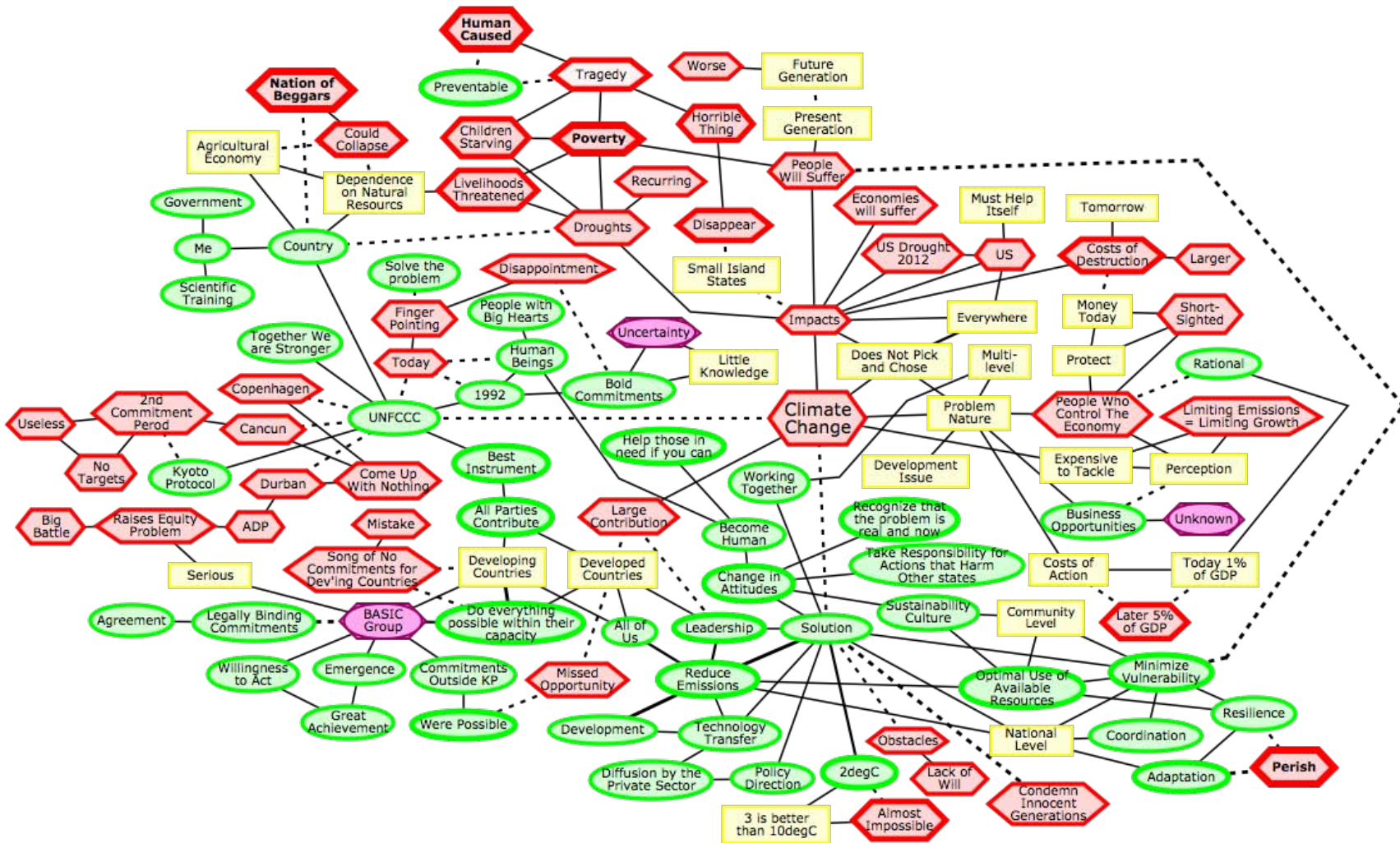


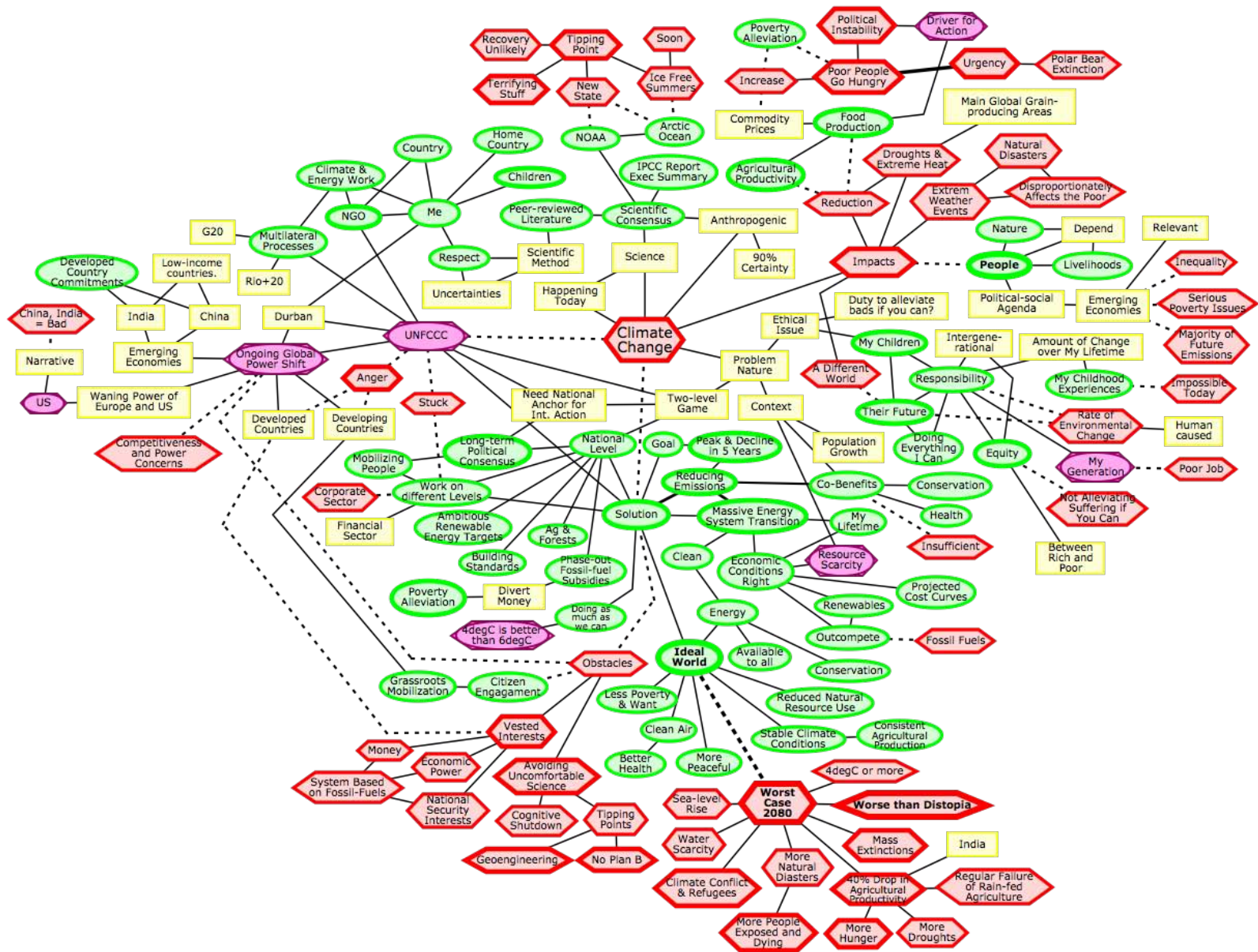
GROUP 3-LEHV & Environment NGOs



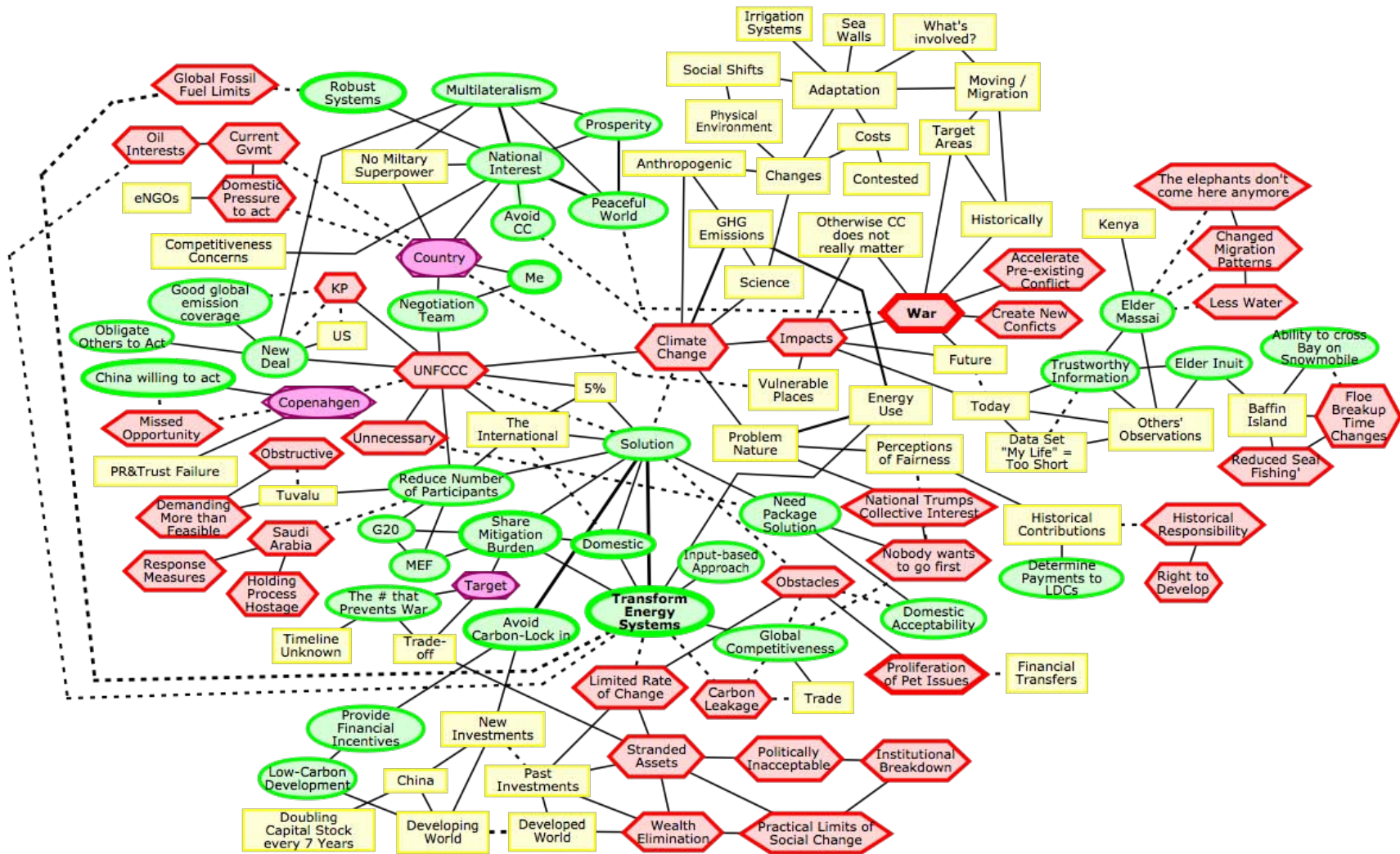




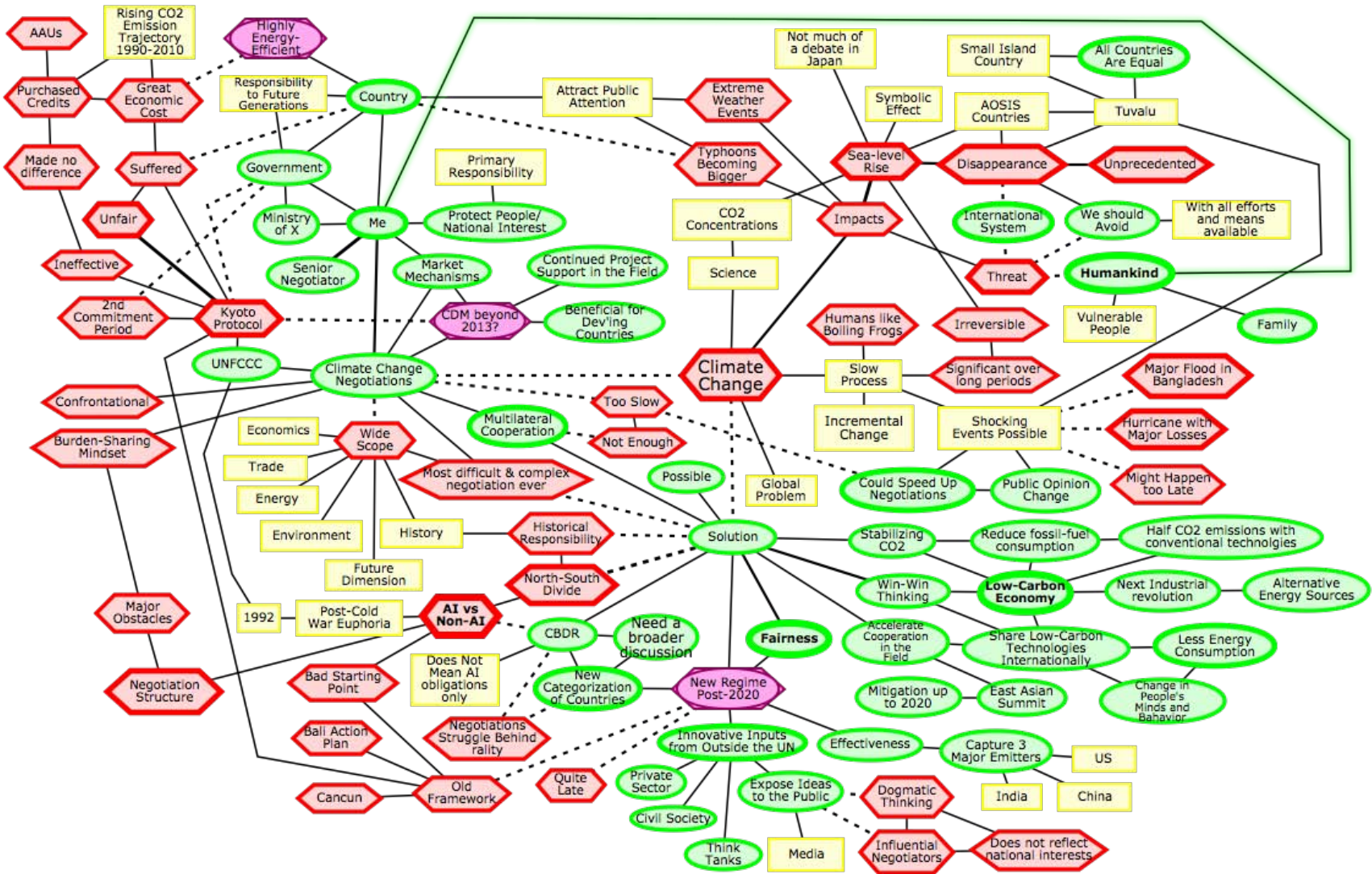


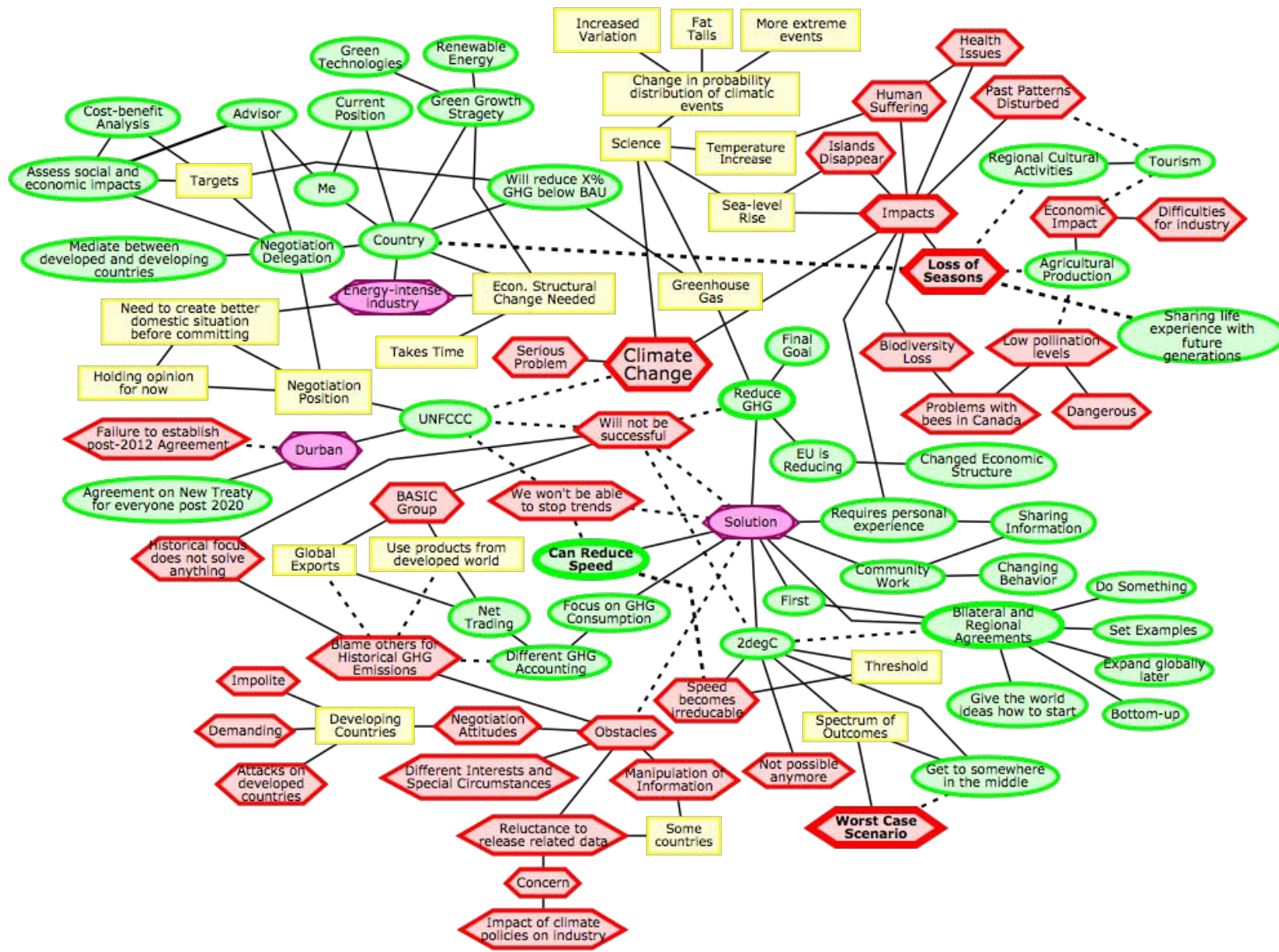


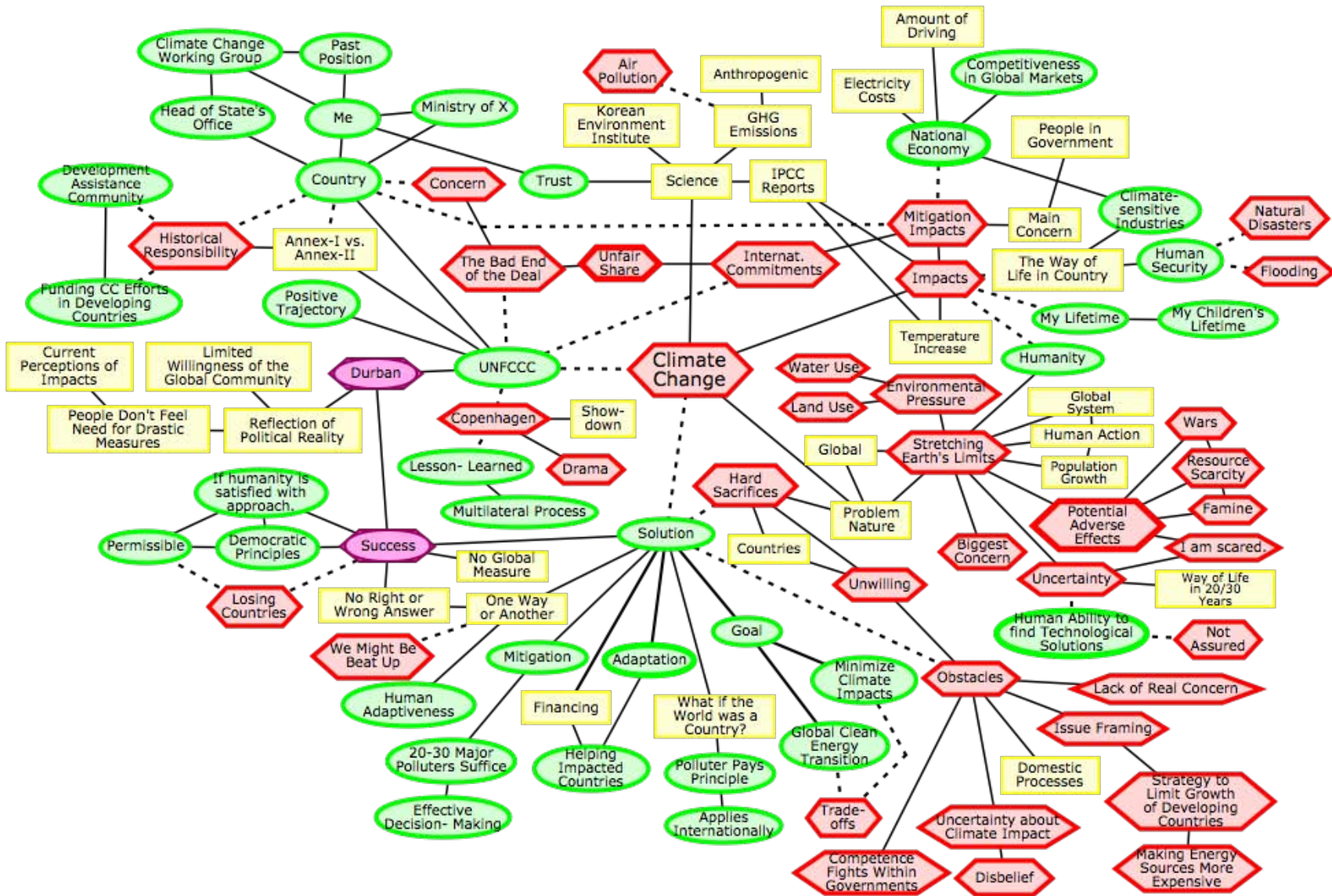


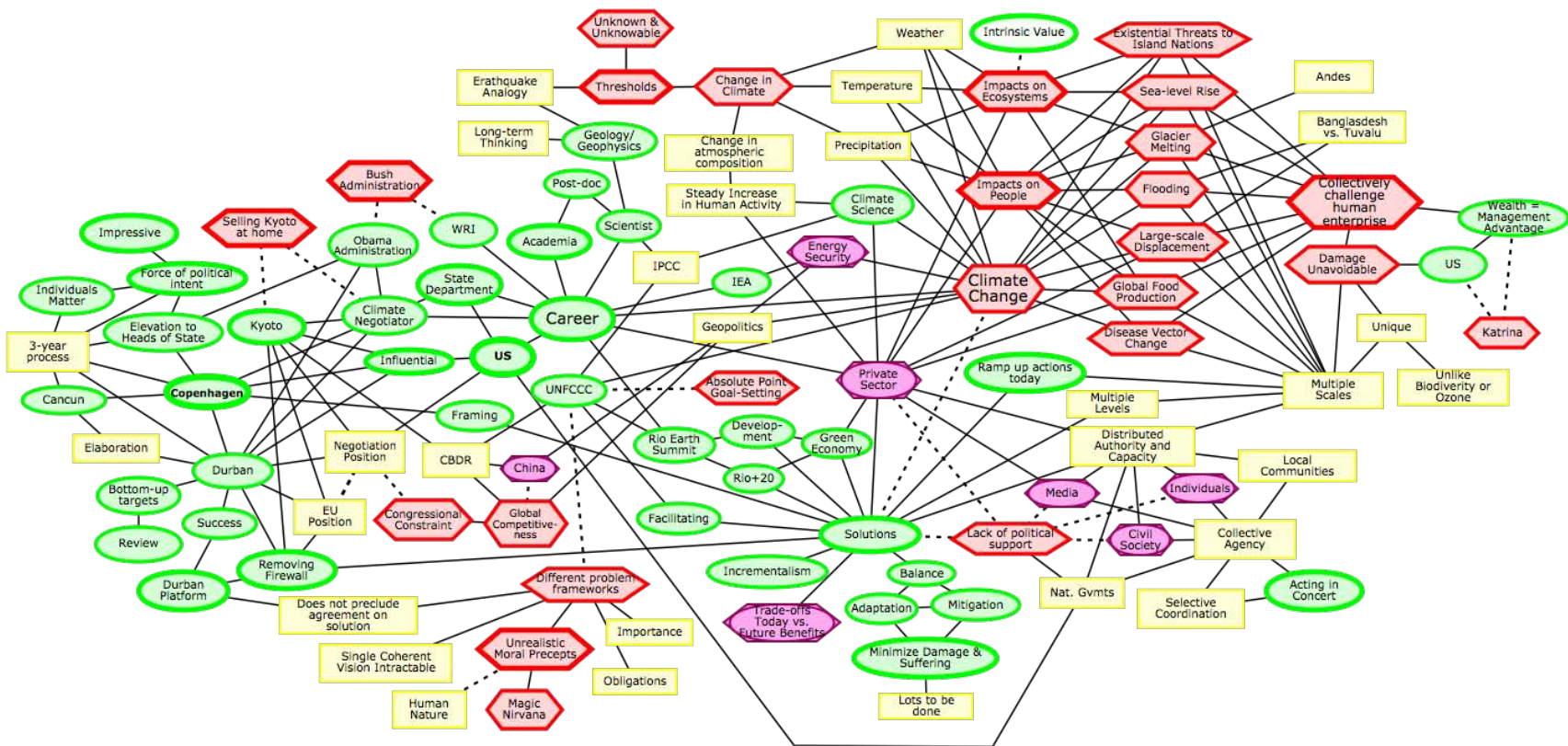






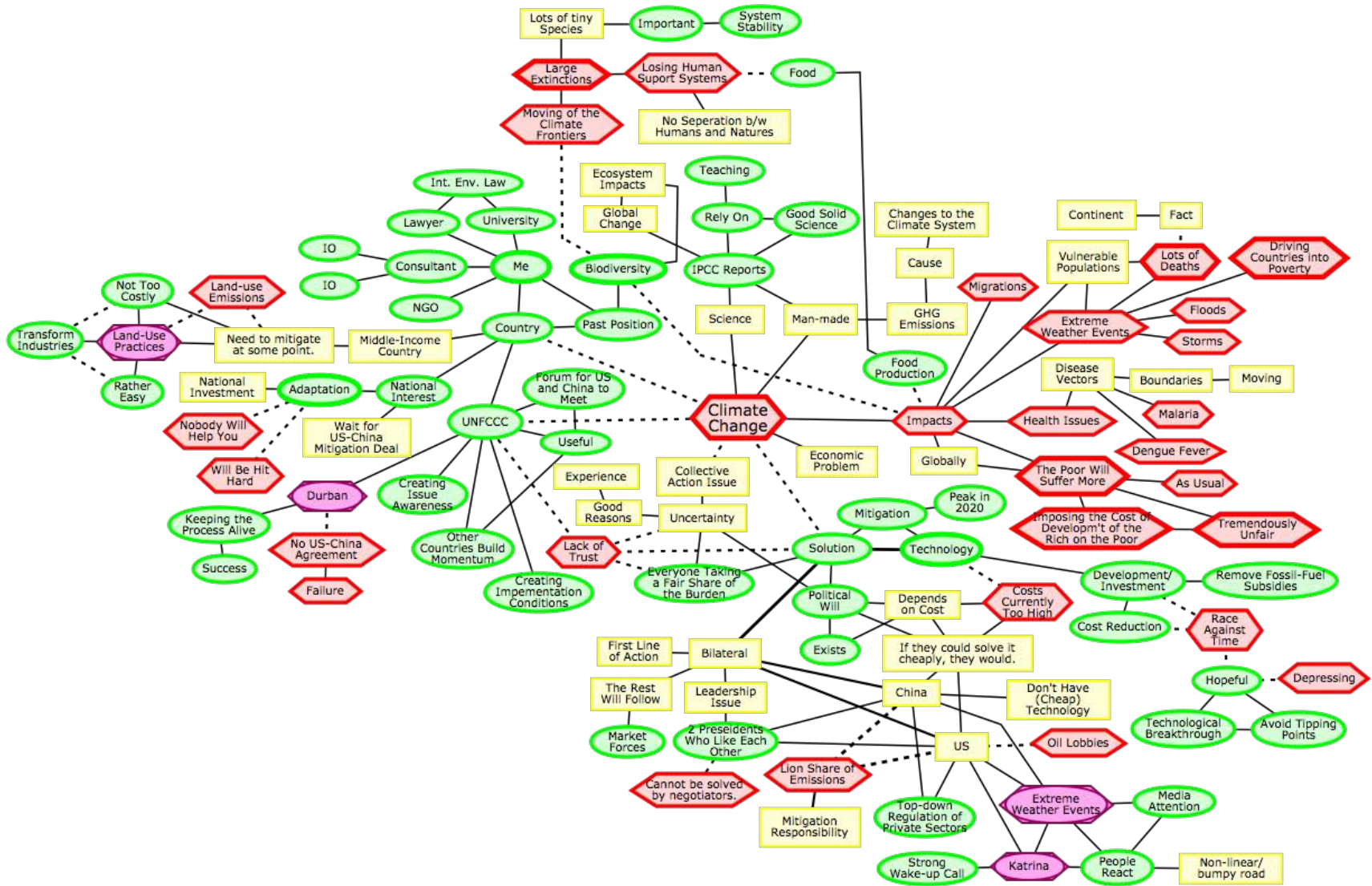


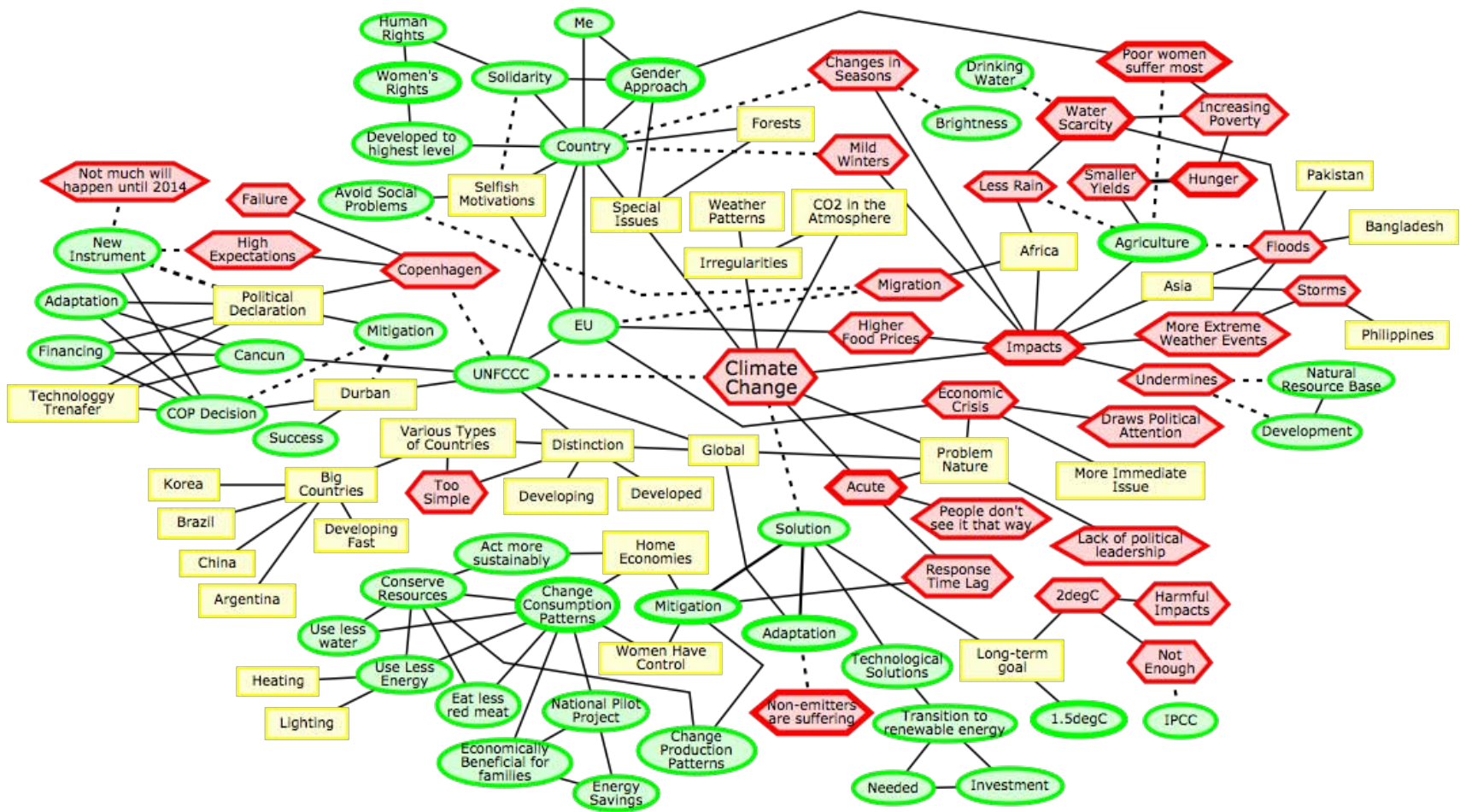






GROUP 5-MELV & Environment and Market NGOs















APPENDIX Ch3-5

Cognitive-Affective Maps – Coding Scheme

Approach	Theme	Concept Categories	Sub-categories
PART 1: IR Theory	Rational Choice Institutionalism	Rational Choice	Costs Benefits Power-balancing National Interest Competitiveness Institutional effects (trust, ...) Incentive Structure
	Social Constructivism	Identity	Group Membership In- vs. out-group/ in-group preference Group Purpose Group Norms (non-justice) Place-based identity
		Norms & Justice	Group Norms (justice) Equity North-South Divide Fairness Other
	Domestic Politics	Two-level game	Domestic Actors Domestic Processes Diplomatic Mandates
PART 2: Special Characteristics	Complexity	Systemic Thinking	Non-linearity & Feedbacks Multiple scales Cascading effects Other
		Mechanistic Thinking	Incrementalism Linearity
		Pervasiveness	Societal Change Everybody's Responsibility
	Uncertainty	Scientific General Measuring Success	
	Myopia	Time Scales	Peaking ADP Agreement Delay / Inertia Future Generations Other
		Institutionalized Short-termism	Democratic Elections Other
	Imperceptibility	Abstract Knowledge Personal Experience 3rd Party Experience	
	Tipping Points	Irreversibility Catastrophe	
	Multiple Stresses		
	Lack of Intentionality	Blame	Historical Responsibility
Other	Agency	Actor types Paths of Influence Model of Change	
	Hope	Sources Strength Loss of Hope	
	Emotions	Positive Negative Other	
Goal			

APPENDIX Ch3-6

National CO2 Emissions from Energy Production in 2010

– Cut-offs Between High, Medium and Low

(Data Source: US Energy Information Administration, <http://www.eia.gov/>)

Total Carbon Dioxide Emissions from the Consumption of Energy (Million Metric Tons)					
Country	2010	Rank	Group	Group Rank	Total
China	8,320.96	1	High	1	
United States	5,610.11	2	High	2	
India	1,695.62	3	High	3	
Russia	1,633.80	4	High	4	
Japan	1,164.47	5	High	5	
Germany	793.66	6	High	6	
Korea, South	578.97	7	High	7	
Iran	560.33	8	High	8	
Canada	548.75	9	High	9	
United Kingdom	532.44	10	High	10	
Saudi Arabia	478.41	11	High	11	
South Africa	465.10	12	High	12	
Brazil	453.87	13	High	13	
Mexico	445.28	14	High	14	
Italy	416.37	15	High	15	
Australia	405.34	16	High	16	
France	395.20	17	High	17	
Indonesia	389.43	18	High	18	
Spain	316.43	19	High	19	
Taiwan	305.38	20	High	20	
Poland	303.70	21	High	21	
Thailand	278.49	22	High	22	
Ukraine	275.51	23	High	23	
Turkey	263.54	24	High	24	
Netherlands	263.44	25	High	25	25
United Arab Emirates	199.37	26	Medium	1	
Egypt	196.55	27	Medium	2	
Kazakhstan	184.47	28	Medium	3	
Malaysia	181.93	29	Medium	4	
Singapore	172.19	30	Medium	5	
Argentina	169.83	31	Medium	6	
Venezuela	158.44	32	Medium	7	
Pakistan	151.65	33	Medium	8	
Belgium	127.19	34	Medium	9	
Iraq	118.31	35	Medium	10	
Uzbekistan	114.27	36	Medium	11	

Vietnam	112.80	37	Medium	12
Algeria	110.90	38	Medium	13
Greece	92.99	39	Medium	14
Czech Republic	90.83	40	Medium	15
Philippines	85.63	41	Medium	16
Hong Kong	83.78	42	Medium	17
Kuwait	81.33	43	Medium	18
Nigeria	80.51	44	Medium	19
Romania	78.43	45	Medium	20
Colombia	72.31	46	Medium	21
Israel	70.32	47	Medium	22
Austria	69.46	48	Medium	23
Chile	68.76	49	Medium	24
Belarus	68.24	50	Medium	25
Qatar	64.68	51	Medium	26
Korea, North	63.69	52	Medium	27
Syria	63.10	53	Medium	28
Sweden	62.74	54	Medium	29
Turkmenistan	62.05	55	Medium	30
Libya	60.60	56	Medium	31
Bangladesh	56.74	57	Medium	32
Oman	55.20	58	Medium	33
Finland	54.40	59	Medium	34
Portugal	51.43	60	Medium	35
Hungary	50.39	61	Medium	36
Trinidad and Tobago	49.93	62	Medium	37
Serbia	49.92	63	Medium	38
Denmark	45.96	64	Medium	39
Switzerland	45.55	65	Medium	40
Bulgaria	42.17	66	Medium	41
Peru	41.88	67	Medium	42
Norway	41.80	68	Medium	43
Ireland	40.48	69	Medium	44
New Zealand	39.58	70	Medium	45
Morocco	35.66	71	Medium	46
Azerbaijan	35.12	72	Medium	47
Slovakia	34.54	73	Medium	48
Cuba	34.46	74	Medium	49
Puerto Rico	30.86	75	Medium	50
Bahrain	30.69	76	Medium	51
Yemen	26.50	77	Medium	52
Ecuador	24.43	78	Medium	53
Angola	24.20	79	Medium	54
Croatia	23.43	80	Medium	55
Estonia	20.56	81	Medium	56
Bosnia and Herzegovina	20.14	82	Medium	57
Dominican Republic	19.60	83	Medium	58
Jordan	19.07	84	Medium	59
Tunisia	18.72	85	Medium	60
Slovenia	17.42	86	Medium	61
Lithuania	15.98	87	Medium	62
Panama	15.46	88	Medium	63
Lebanon	15.24	89	Medium	64
Sri Lanka	14.09	90	Medium	65

Sudan and South Sudan	13.79	91	Medium	66	
Bolivia	13.29	92	Medium	67	
Guatemala	12.97	93	Medium	68	
Burma (Myanmar)	12.80	94	Medium	69	
Kenya	12.25	95	Medium	70	
Virgin Islands, U.S.	11.95	96	Medium	71	
Armenia	11.56	97	Medium	72	
Luxembourg	10.80	98	Medium	73	
Ghana	10.58	99	Medium	74	74
Mongolia	9.44	100	Low	1	
Cyprus	9.26	101	Low	2	
Jamaica	9.22	102	Low	3	
Latvia	9.07	103	Low	4	
Netherlands Antilles	8.82	104	Low	5	
Zimbabwe	8.49	105	Low	6	
Honduras	8.29	106	Low	7	
Brunei	8.27	107	Low	8	
Macedonia	8.23	108	Low	9	
Tanzania	7.57	109	Low	10	
Moldova	7.38	110	Low	11	
Cameroon	7.36	111	Low	12	
Uruguay	7.27	112	Low	13	
Ethiopia	6.74	113	Low	14	
Senegal	6.68	114	Low	15	
Tajikistan	6.68	115	Low	16	
Congo (Brazzaville)	6.52	116	Low	17	
El Salvador	6.48	117	Low	18	
Costa Rica	6.41	118	Low	19	
Cote d'Ivoire (Ivory Coast)	5.94	119	Low	20	
Bahamas, The	5.57	120	Low	21	
Papua New Guinea	5.31	121	Low	22	
Georgia	5.30	122	Low	23	
Equatorial Guinea	5.00	123	Low	24	
Albania	4.89	124	Low	25	
Nicaragua	4.82	125	Low	26	
Gabon	4.59	126	Low	27	
Mauritius	4.55	127	Low	28	
Paraguay	4.39	128	Low	29	
Kyrgyzstan	4.13	129	Low	30	
Gibraltar	3.91	130	Low	31	
Botswana	3.84	131	Low	32	
Namibia	3.81	132	Low	33	
Benin	3.65	133	Low	34	
Cambodia	3.59	134	Low	35	
Madagascar	3.38	135	Low	36	
Palestine	3.38	136	Low	37	
Nepal	3.36	137	Low	38	
Iceland	3.36	138	Low	39	
Togo	3.17	139	Low	40	
Malta	3.11	140	Low	41	
New Caledonia	3.03	141	Low	42	
Reunion	2.96	142	Low	43	
Mauritania	2.89	143	Low	44	

Congo (Kinshasa)	2.80	144	Low	45
Martinique	2.77	145	Low	46
Mozambique	2.73	146	Low	47
Macau	2.54	147	Low	48
Fiji	2.50	148	Low	49
Zambia	2.42	149	Low	50
Djibouti	2.35	150	Low	51
Suriname	2.34	151	Low	52
Guadeloupe	2.10	152	Low	53
Uganda	2.01	153	Low	54
Montenegro	1.94	154	Low	55
Niger	1.80	155	Low	56
Barbados	1.57	156	Low	57
Guyana	1.52	157	Low	58
Haiti	1.46	158	Low	59
Guam	1.45	159	Low	60
Burkina Faso	1.44	160	Low	61
Guinea	1.39	161	Low	62
Malawi	1.36	162	Low	63
Sierra Leone	1.33	163	Low	64
Wake Island	1.29	164	Low	65
Seychelles	1.25	165	Low	66
Aruba	1.24	166	Low	67
French Polynesia	1.22	167	Low	68
Laos	1.19	168	Low	69
French Guiana	1.12	169	Low	70
Swaziland	1.11	170	Low	71
Belize	0.98	171	Low	72
Maldives	0.92	172	Low	73
Somalia	0.90	173	Low	74
Mali	0.89	174	Low	75
Rwanda	0.87	175	Low	76
Bermuda	0.81	176	Low	77
Eritrea	0.80	177	Low	78
Afghanistan	0.79	178	Low	79
Faroe Islands	0.74	179	Low	80
Liberia	0.74	180	Low	81
Antigua and Barbuda	0.72	181	Low	82
American Samoa	0.69	182	Low	83
Greenland	0.56	183	Low	84
Burundi	0.53	184	Low	85
Guinea-Bissau	0.46	185	Low	86
Saint Lucia	0.43	186	Low	87
Grenada	0.43	187	Low	88
Timor-Leste (East Timor)	0.40	188	Low	89
Solomon Islands	0.36	189	Low	90
Saint Vincent/Grenadines	0.33	190	Low	91
Western Sahara	0.31	191	Low	92
Antarctica	0.31	192	Low	93
Saint Kitts and Nevis	0.30	193	Low	94
Cook Islands	0.30	194	Low	95
U.S. Pacific Islands	0.29	195	Low	96
Gambia, The	0.29	196	Low	97
Chad	0.29	197	Low	98

Lesotho	0.28	198	Low	99	
Bhutan	0.28	199	Low	100	
Cayman Islands	0.27	200	Low	101	
Cape Verde	0.27	201	Low	102	
Central African Republic	0.23	202	Low	103	
Nauru	0.22	203	Low	104	
Tonga	0.16	204	Low	105	
Saint Pierre and Miquelon	0.15	205	Low	106	
Sao Tome and Principe	0.15	206	Low	107	
Comoros	0.15	207	Low	108	
Virgin Islands, British	0.15	208	Low	109	
Samoa	0.15	209	Low	110	
Montserrat	0.15	210	Low	111	
Vanuatu	0.15	211	Low	112	
Dominica	0.14	212	Low	113	
Falkland Islands (Islas Malvinas)	0.05	213	Low	114	
Kiribati	0.04	214	Low	115	
Turks and Caicos Islands	0.04	215	Low	116	
Saint Helena	0.02	216	Low	117	
Niue	0.01	217	Low	118	118
Asia & Oceania	14,161.44				
Middle East	1,785.93				
Central & South America	1,257.74				
Africa	1,145.16				
World	31,780.36				

APPENDIX Ch3-7

National Vulnerability Ranking in 2010

(Data Source: GAIN Index, Global Adaptation Institute, <http://index.gain.org/>)

GAIN Index rankings | GAIN Index

<http://index.gain.org/>

GAIN Index

Country Rankings

Rank countries by GAIN Index, Vulnerability and Readiness.

Table values show latest scores for 2010

Rank	Country	Income group	Score
1	Denmark	Upper	85.4
2	Switzerland	Upper	83.6
3	Ireland	Upper	82.2
4	Australia	Upper	82.0
5	New Zealand	Upper	81.7
6	Finland	Upper	81.7
7	Norway	Upper	81.4
8	United States	Upper	80.0
9	Germany	Upper	80.0
10	United Kingdom	Upper	80.0
11	Sweden	Upper	79.7
12	Czech Republic	Upper	79.7
13	Austria	Upper	79.5
14	Netherlands	Upper	79.2
15	Iceland	Upper	78.7
16	France	Upper	78.7
17	Luxembourg	Upper	78.5
18	Poland	Upper middle	78.2
19	Canada	Upper	78.2
20	Chile	Upper middle	77.7
21	Slovenia	Upper	77.3
22	Uruguay	Upper middle	77.3
23	Spain	Upper	77.2
24	Slovakia	Upper	76.6

<i>Rank</i>	<i>Country</i>	<i>Income group</i>	Score
25	Japan	Upper	75.5
26	Hungary	Upper	75.4
27	Lithuania	Upper middle	75.3
28	Estonia	Upper	75.2
29	Belgium	Upper	75.0
30	Portugal	Upper	74.7
31	Italy	Upper	74.6
32	Latvia	Upper middle	74.4
33	Greece	Upper	74.0
34	Cyprus	Upper	73.7
35	Croatia	Upper middle	73.7
36	Bulgaria	Upper middle	73.3
37	Malta	Upper	72.5
38	Romania	Upper middle	72.3
39	Israel	Upper	71.9
40	Republic of Korea	Upper	71.9
41	Macedonia	Lower middle	71.7
42	Mauritius	Upper middle	70.9
43	Argentina	Upper middle	70.3
44	Armenia	Lower middle	69.7
45	Malaysia	Upper middle	69.2
46	Oman	Upper	68.9
47	Qatar	Upper	68.8
48	Bosnia & Herzegovina	Lower middle	68.8
49	United Arab Emirates	Upper	68.6
50	Thailand	Lower middle	68.3
51	Serbia	Upper	68.1
52	Jordan	Lower middle	67.5
53	Kuwait	Upper	67.4
54	Panama	Upper middle	67.2
55	Kazakhstan	Upper middle	67.2

<i>Rank</i>	<i>Country</i>	<i>Income group</i>	Score
56	Turkey	Upper middle	66.9
57	Belarus	Upper middle	66.9
58	Georgia	Lower middle	66.9
59	Bahamas	Upper	66.7
60	Mexico	Upper middle	66.5
61	Saint Lucia	Upper middle	66.4
62	Costa Rica	Upper middle	66.3
63	Brazil	Upper middle	65.9
64	Cape Verde	Lower middle	65.9
65	Bahrain	Upper	65.9
66	El Salvador	Lower middle	65.6
67	Colombia	Lower middle	65.4
68	Ukraine	Lower middle	64.9
69	Kyrgyzstan	Low	64.8
70	Egypt	Lower middle	64.8
71	Albania	Lower middle	64.7
72	Trinidad & Tobago	Upper	64.7
73	Lebanon	Upper middle	64.4
74	Peru	Lower middle	64.3
75	Dominican Republic	Lower middle	64.3
76	Saudi Arabia	Upper	64.1
77	Tunisia	Lower middle	63.8
78	Azerbaijan	Lower middle	63.5
79	Jamaica	Upper middle	63.5
80	Moldova	Lower middle	63.5
81	Ecuador	Lower middle	63.4
82	Russian Federation	Upper middle	63.0
83	Paraguay	Lower middle	63.0
84	Belize	Upper middle	62.6
85	Indonesia	Lower middle	62.6
86	Philippines	Lower middle	61.9

<i>Rank</i>	<i>Country</i>	<i>Income group</i>	Score
87	Mongolia	Lower middle	61.8
88	Suriname	Upper middle	61.6
89	Venezuela	Upper middle	61.2
90	South Africa	Upper middle	61.2
91	Algeria	Lower middle	60.9
92	Honduras	Lower middle	60.5
93	Dominica	Upper middle	60.5
94	Iran	Lower middle	60.4
95	Botswana	Upper middle	60.4
96	China	Lower middle	60.3
97	Nicaragua	Lower middle	60.3
98	Viet Nam	Low	60.2
99	Samoa	Lower middle	60.2
100	Guatemala	Lower middle	60.1
101	Fiji	Upper middle	59.5
102	Libya	Upper middle	58.9
103	Syria	Lower middle	58.7
104	Bolivia	Lower middle	58.3
105	Tonga	Lower middle	58.0
106	Vanuatu	Lower middle	58.0
107	Morocco	Lower middle	57.5
108	Uzbekistan	Low	57.4
109	Namibia	Lower middle	57.2
110	Cuba	Upper middle	56.7
111	Bhutan	Lower middle	56.3
112	Gabon	Upper middle	56.2
113	Ghana	Low	55.8
114	Tajikistan	Low	55.1
115	Guyana	Lower middle	54.7
116	Gambia	Low	53.7
117	India	Lower middle	53.6

<i>Rank</i>	<i>Country</i>	<i>Income group</i>	Score
118	Swaziland	Lower middle	52.3
119	Pakistan	Low	52.0
120	Sao Tome & Principe	Low	51.5
121	Benin	Low	51.5
122	Senegal	Low	50.8
123	Djibouti	Lower middle	50.4
124	Cambodia	Low	50.1
125	Laos	Low	50.1
126	Tanzania	Low	50.0
127	Madagascar	Low	49.6
128	Rwanda	Low	49.4
129	Bangladesh	Low	49.4
130	Burkina Faso	Low	49.4
131	Côte d'Ivoire	Low	49.3
132	Uganda	Low	49.1
133	Zambia	Low	48.9
134	Cameroon	Lower middle	48.6
135	Malawi	Low	48.5
136	Nepal	Low	48.4
137	Mali	Low	48.2
138	Kenya	Low	48.1
139	Lesotho	Lower middle	47.9
140	Nigeria	Low	47.7
141	Comoros	Low	47.6
142	Papua New Guinea	Low	47.6
143	Equatorial Guinea	Upper	47.3
144	Mozambique	Low	47.3
145	Congo	Lower middle	47.3
146	Mauritania	Low	46.6
147	Yemen	Low	45.7
148	Guinea-Bissau	Low	45.4

<i>Rank</i>	<i>Country</i>	<i>Income group</i>	Score
149	Guinea	Low	44.9
150	Togo	Low	44.5
151	Niger	Low	44.0
152	Liberia	Low	43.6
153	Sierra Leone	Low	43.4
154	Myanmar	Low	43.0
155	Angola	Lower middle	42.7
156	Eritrea	Low	41.8
157	Ethiopia	Low	40.4
158	Chad	Low	38.4
159	Burundi	Low	38.2
160	Zimbabwe	Low	38.0
161	Central African Republic	Low	37.6
	Tuvalu	Low	-
	Solomon Islands	Low	-
	Singapore	Upper	-
	Seychelles	Upper middle	-
	Sudan	Lower middle	-
	Democratic People's Republic of Korea	Low	-
	Palau	Upper middle	-
	Nauru	Low	-
	Montenegro	Upper	-
	Turkmenistan	Lower middle	-
	Timor-Leste	Low	-
	Marshall Islands	Lower middle	-
	Maldives	Lower middle	-
	Monaco	Upper	-
	Sri Lanka	Lower middle	-
	San Marino	Upper	-
	Liechtenstein	Upper	-
	Saint Kitts and Nevis	Upper middle	-

<i>Rank</i>	<i>Country</i>	<i>Income group</i>	Score
	Kiribati	Lower middle	-
	Iraq	Lower middle	-
	Haiti	Low	-
	Grenada	Upper middle	-
	St Vincent & Grenadines	Upper middle	-
	Federated States of Micronesia	Lower middle	-
	Democratic Republic of the Congo	Low	-
	Somalia	Low	-
	Brunei Darussalam	Upper	-
	Barbados	Upper	-
	Antigua and Barbuda	Upper	-
	Andorra	Upper	-
	Afghanistan	Low	-

GAIN Index

The GAIN Index, a project of the Global Adaption Institute (GAIN), summarizes a country's Vulnerability to climate change and other global challenges on the one hand and its Readiness to improve resilience on the other hand. It aims to help businesses and the public sector better prioritize investments for a more efficient response to the immediate global challenges ahead.

World wide ranking by GAIN Index, higher scores are better.

Global Adaptation Institute

1747 Pennsylvania Ave NW, Suite 1125 - Washington, DC 20006

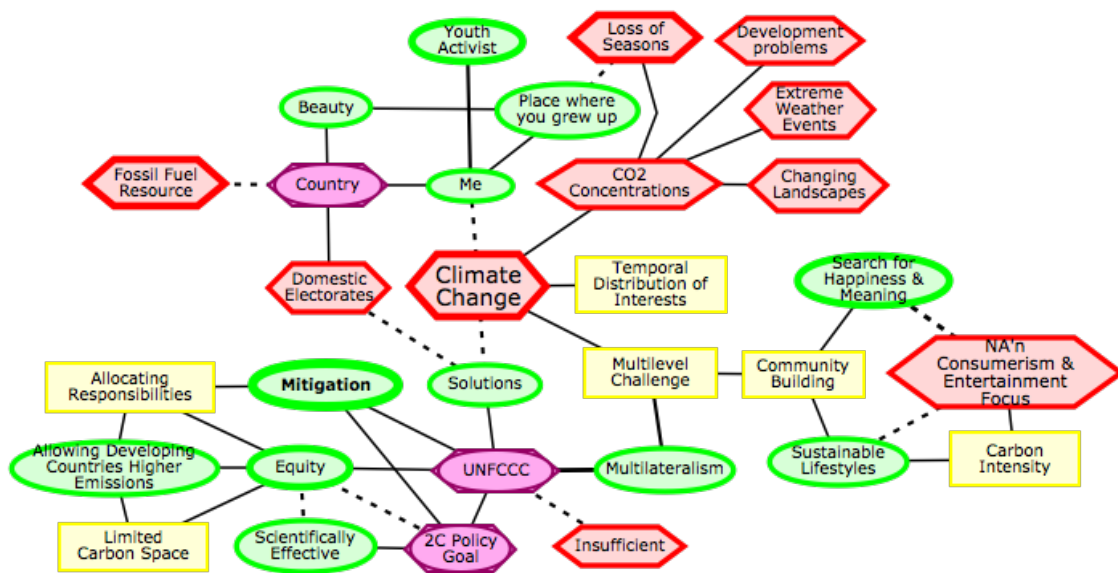
Global Adaptation Institute

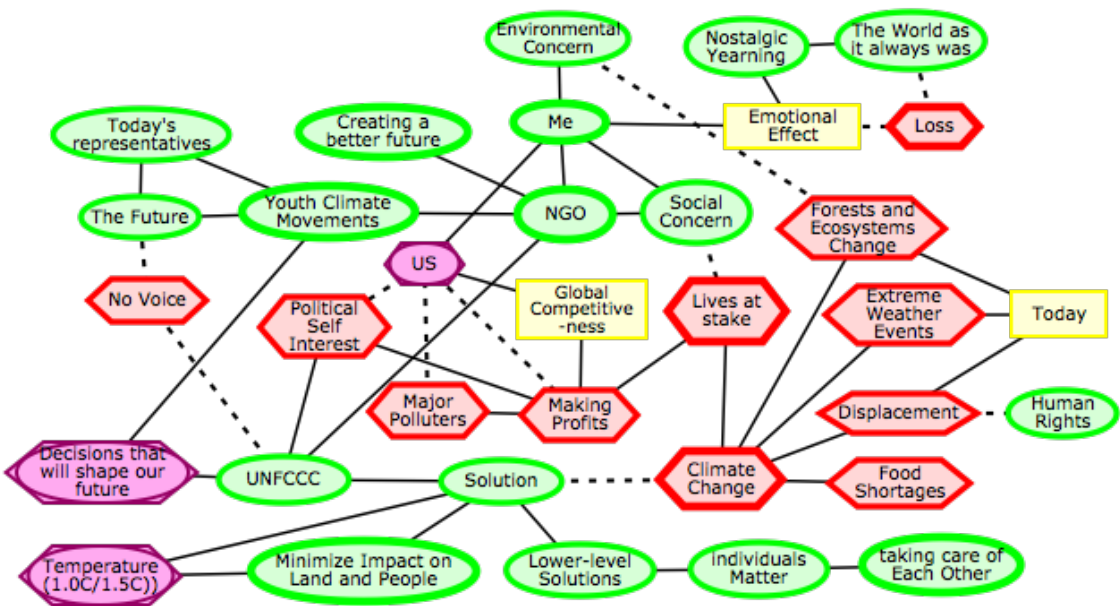
APPENDIX Ch3-8

Participants' Membership in Current UNFCCC Negotiation Groups

	State	Negotiation Group								Participant Group
		Umbrella Group	EU	G77 & China	AOSIS/SIDS	BASIC	LDCs	ALBA	EIG	
1	Argentina			✓					✓	5
2	Australia	✓								4
3	Bangladesh			✓			✓		✓	2
4	Barbados			✓	✓					6
5	Bolivia						✓			2
6	Botswana			✓						3
7	Brazil			✓		✓				1
8	Canada (2)	✓								4
9	Cape Verde			✓	✓					6
10	Colombia			✓						2
11	Denmark		✓							5
12	Dominica			✓	✓				✓	3
13	Finland (2)		✓							5
14	Germany		✓							4
15	Grenada			✓	✓					3
16	Guatemala			✓					✓	2
17	Iceland	✓								6
18	Indonesia			✓					✓	1
19	Japan	✓								4
20	Mozambique			✓			✓			3
21	Namibia			✓						3
22	Pakistan			✓					✓	2
23	Philippines			✓						2
24	Samoa			✓	✓		✓		✓	3
25	Singapore				✓					5
26	South Africa			✓		✓				1
27	South Korea (2)							✓		4
28	Sweden (2)		✓							5
29	Uganda			✓			✓		✓	3
30	US (3)	✓								4
Total		8	5	18	6	2	4	1	2	8

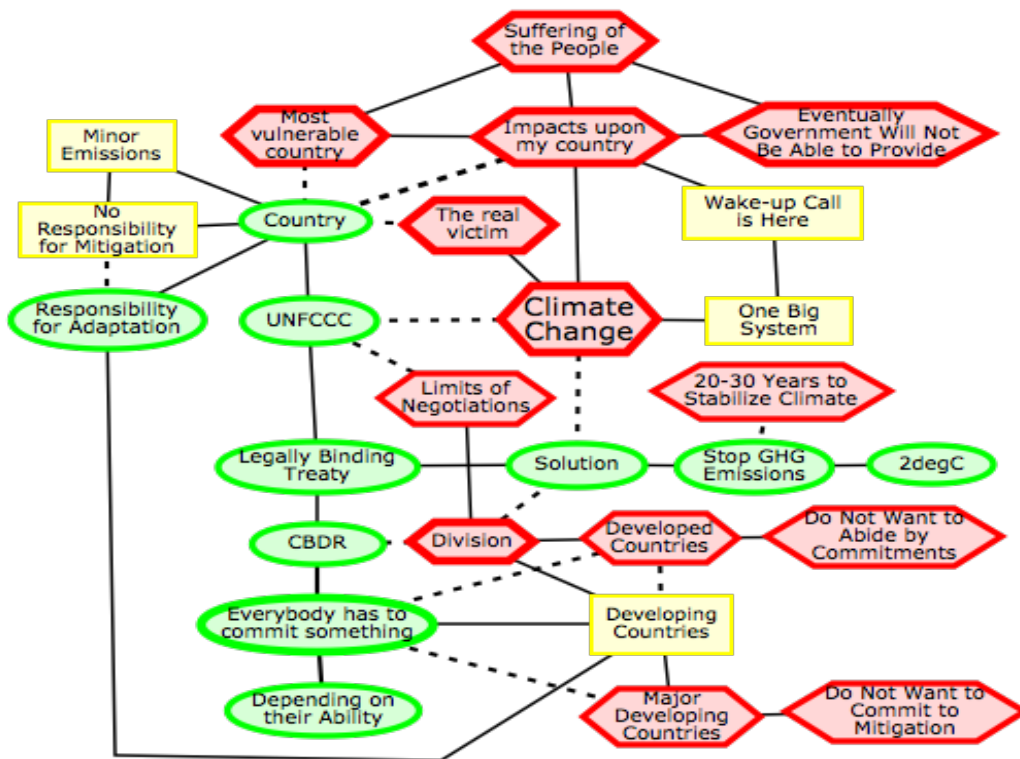
Totals refer to the total number of study participants in this negotiation group (e.g., only five countries of the Umbrella Group are represented, but eight individuals from these five countries participated in the study.)



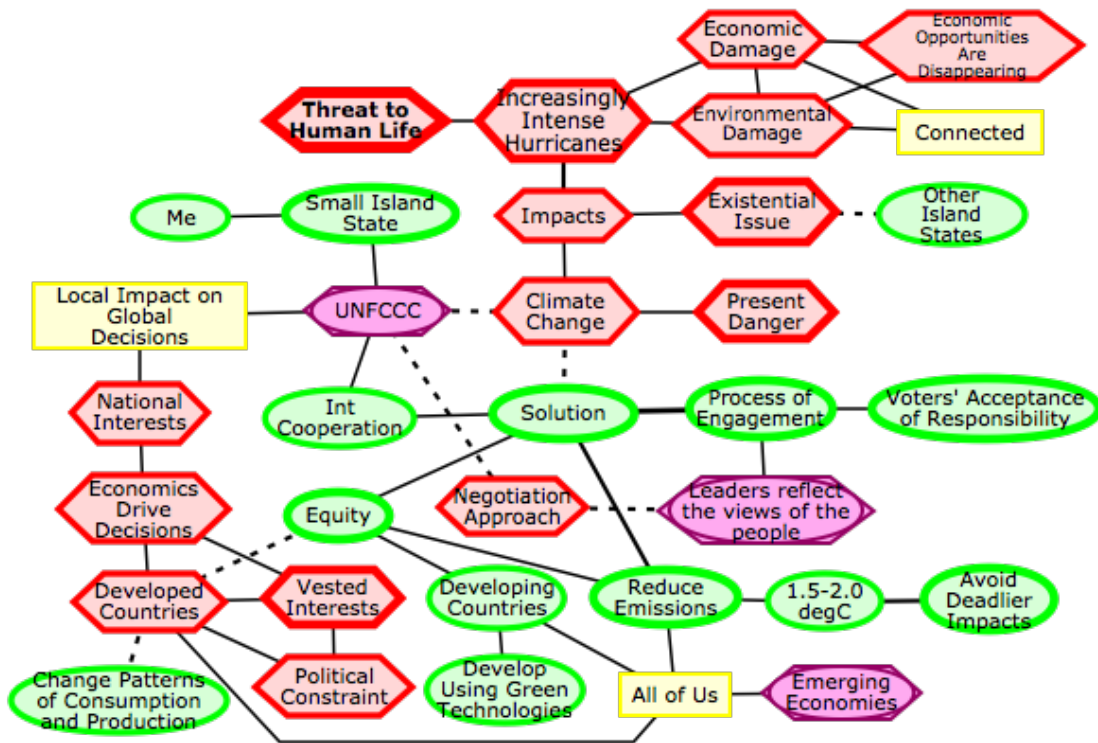


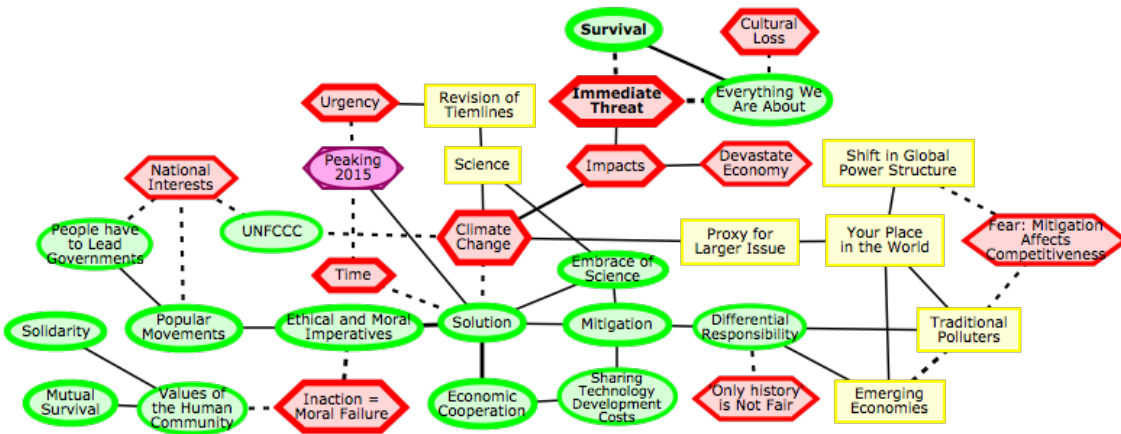
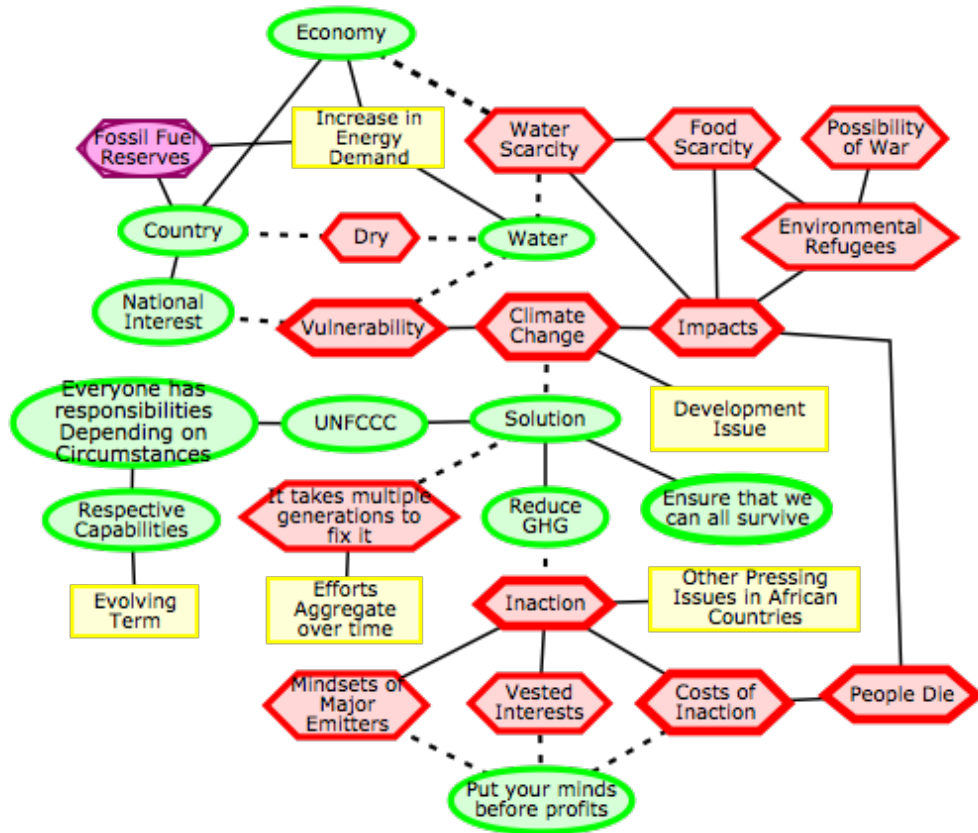
GROUP 2-MEHV & Faith and Development NGOs

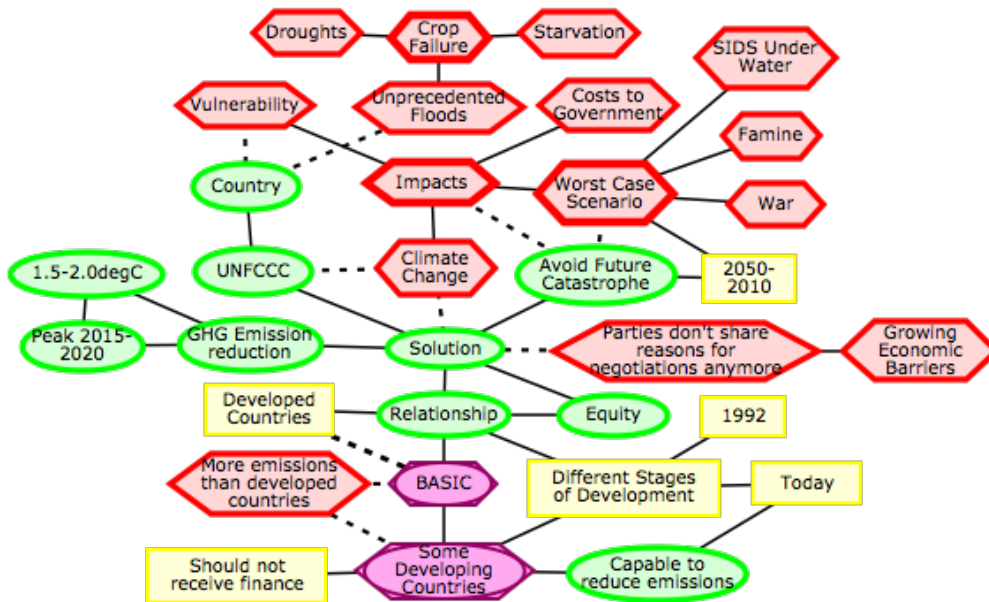


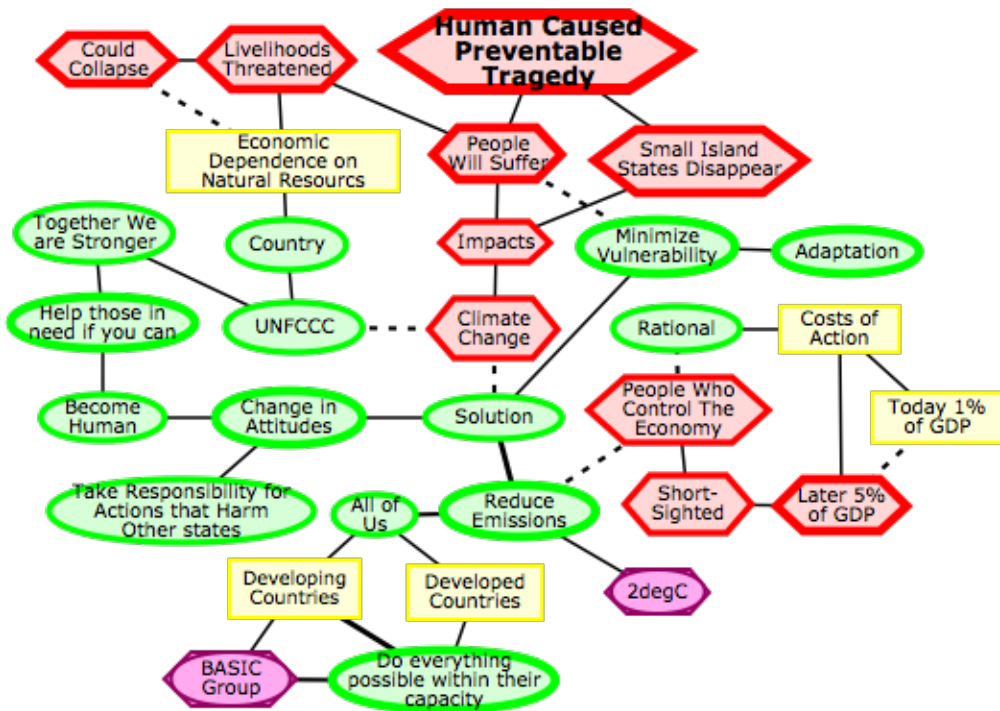
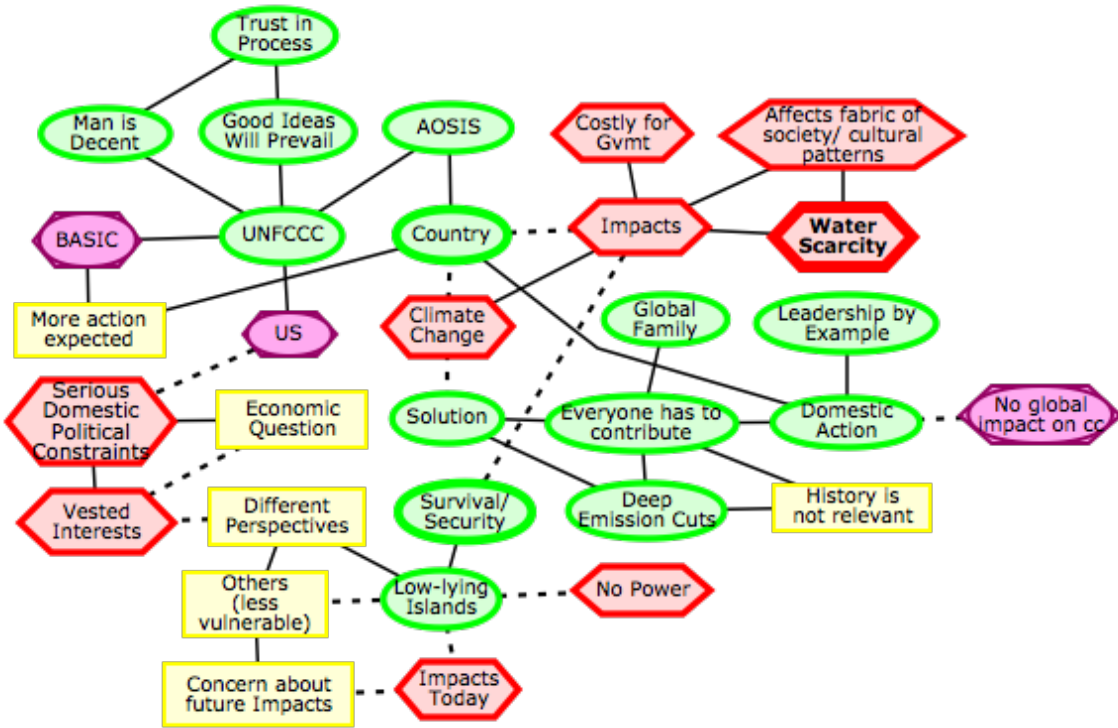


GROUP 3-LEHV & Environment NGOs

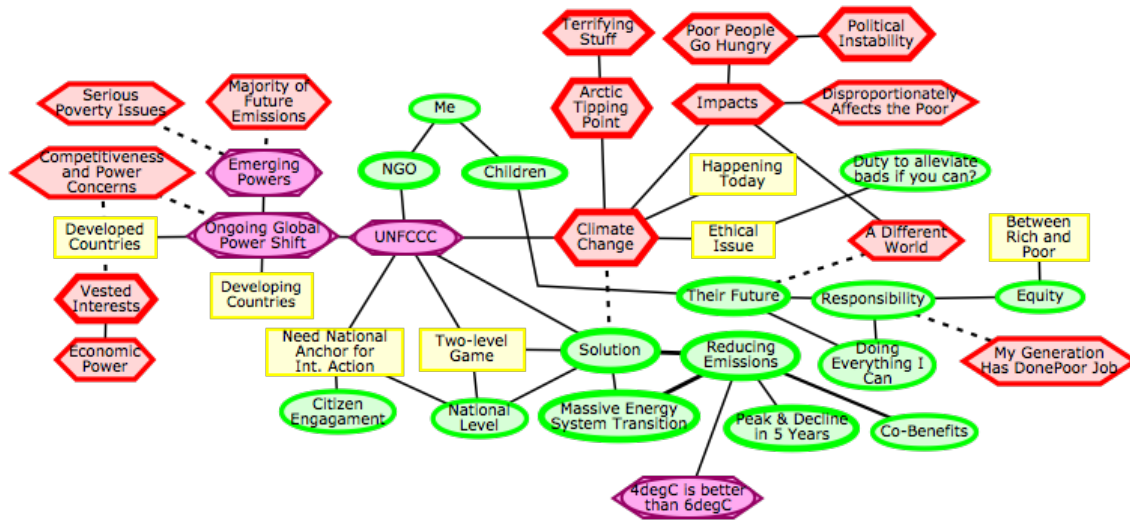




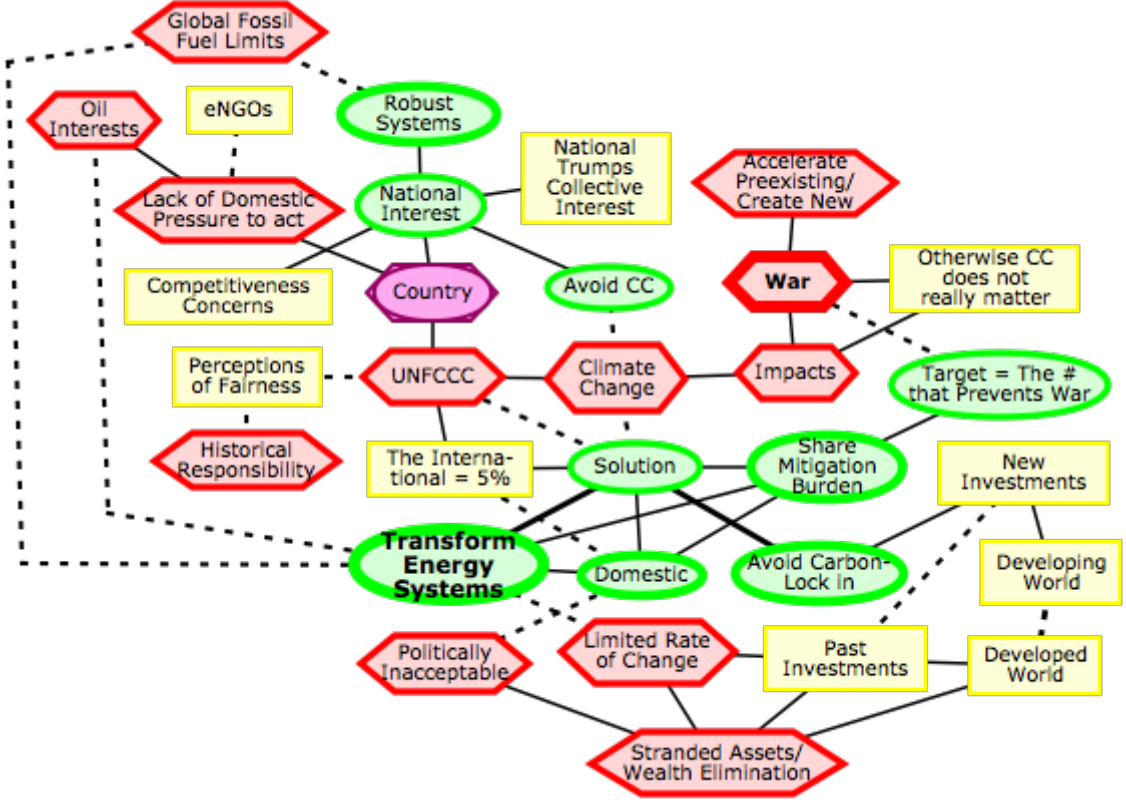
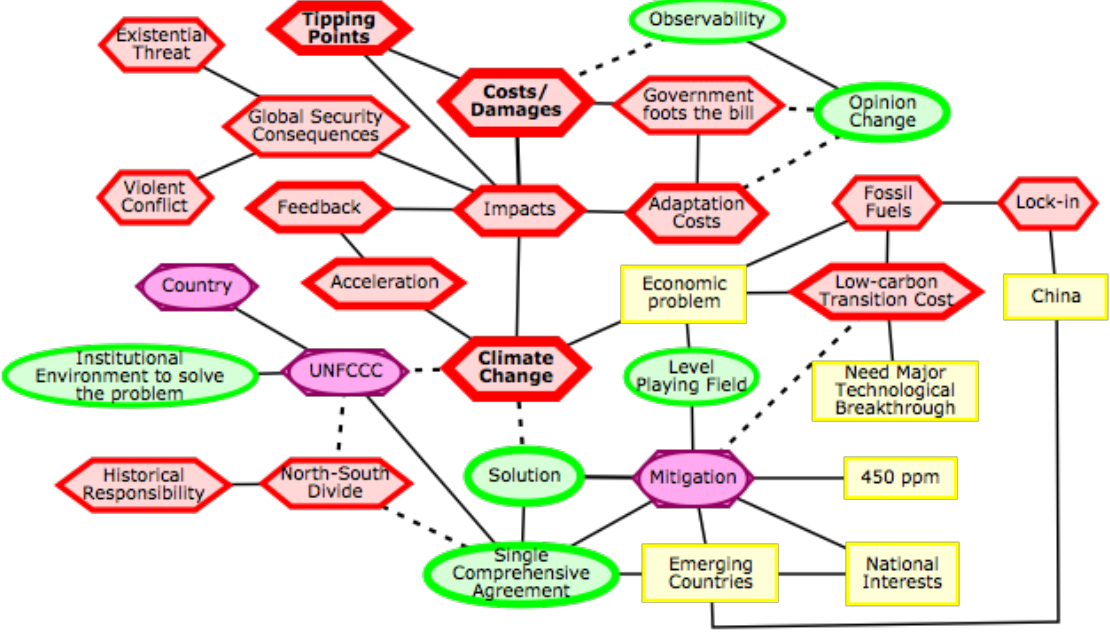


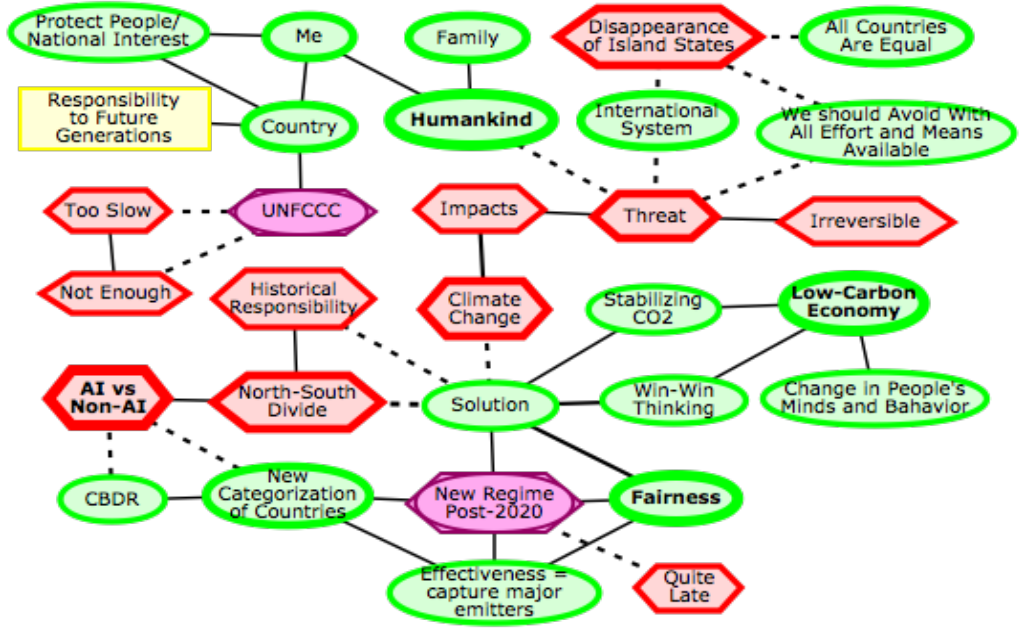
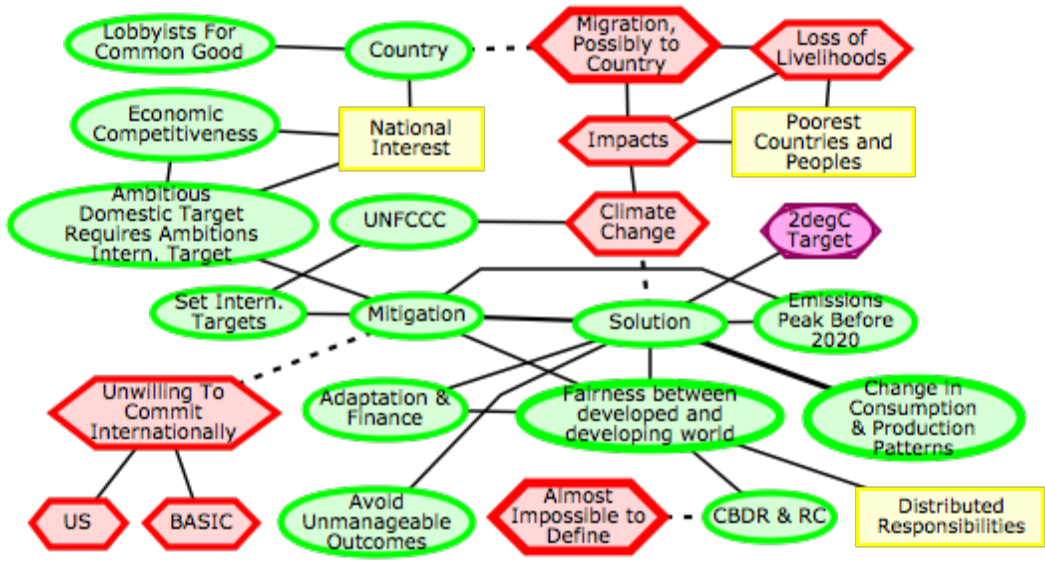


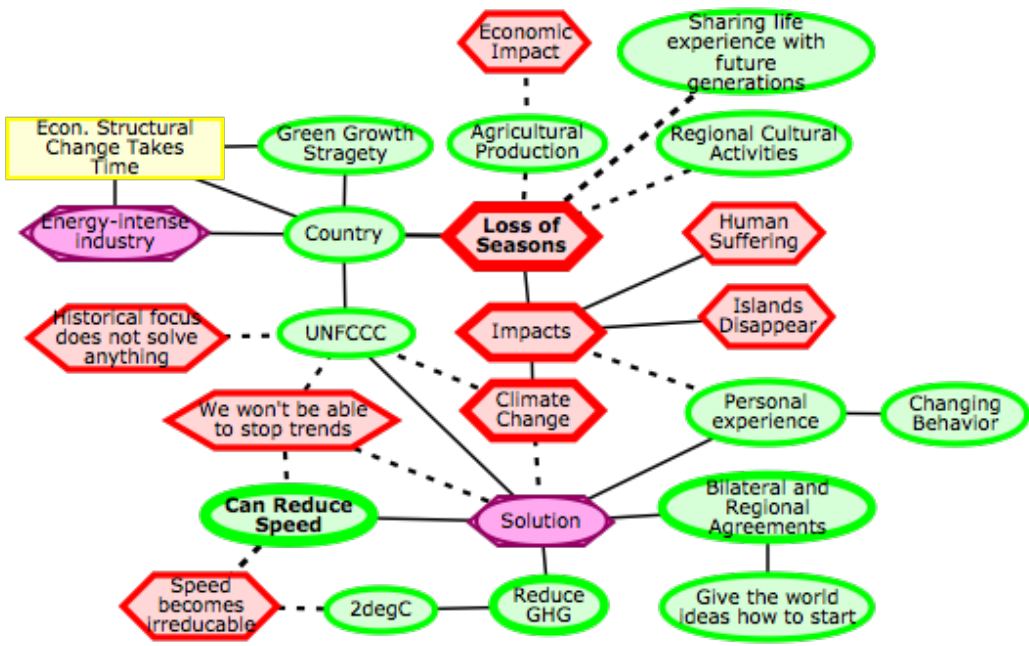


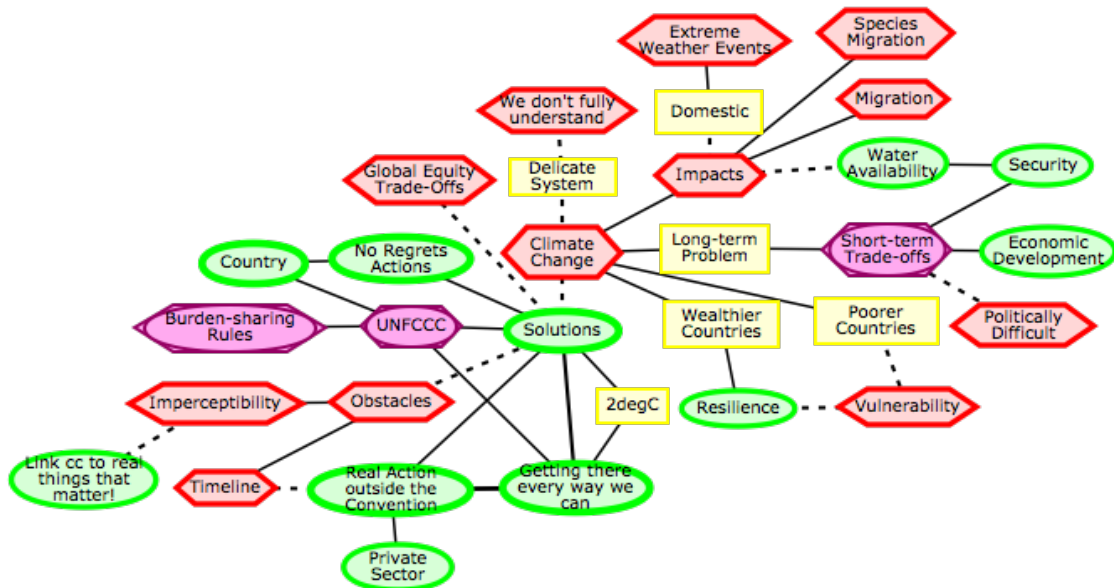
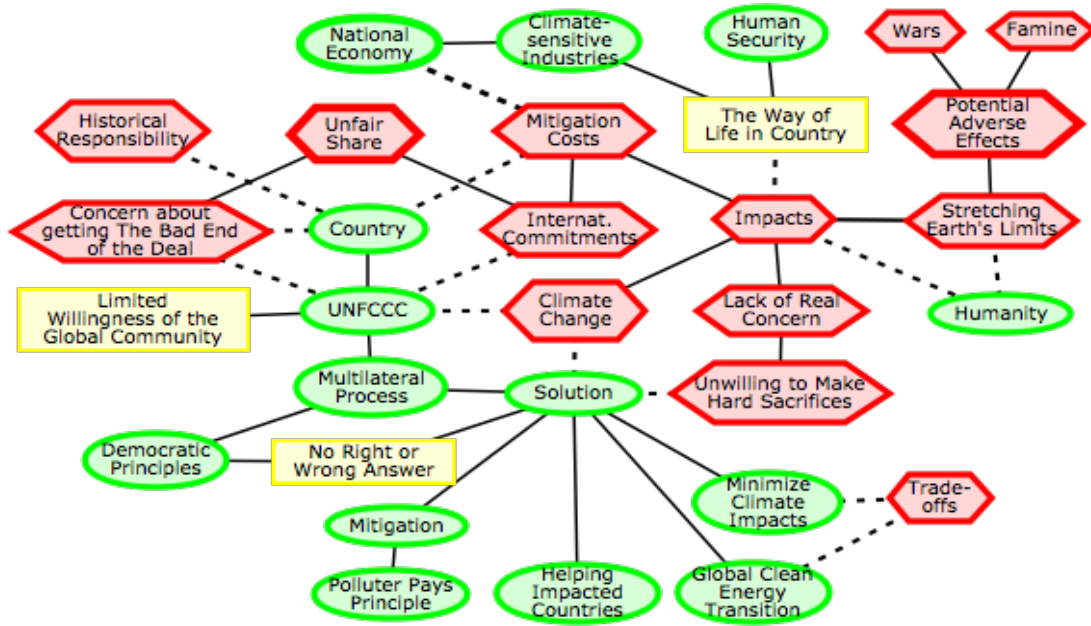


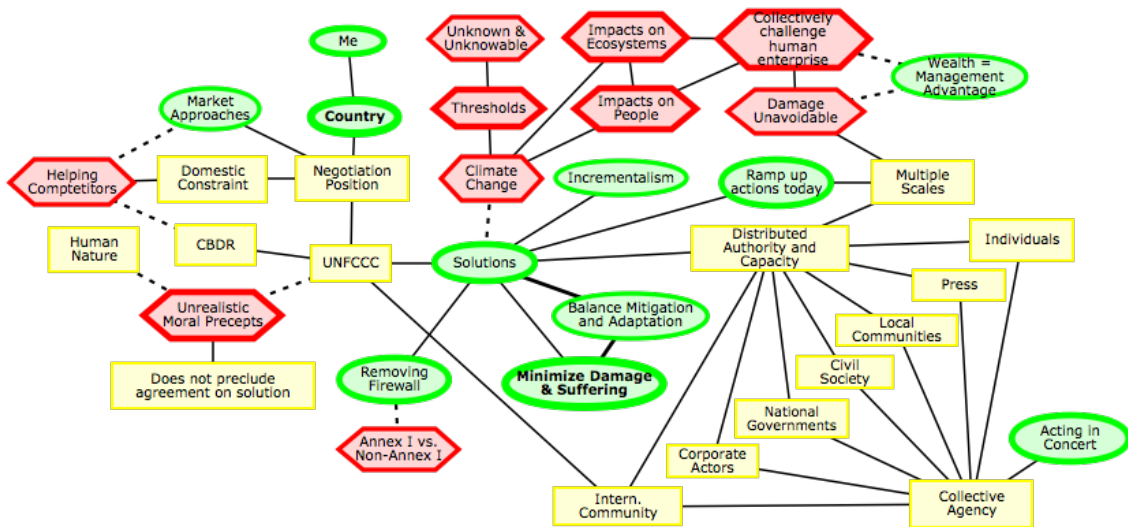
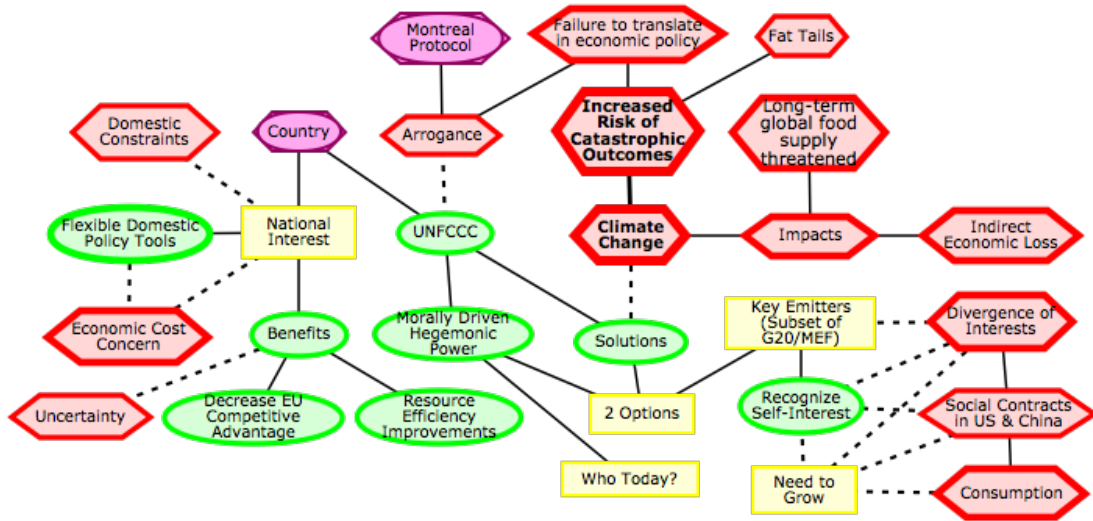
GROUP 4-HELV & Business and Technology NGOs & Fossil Fuel Industry

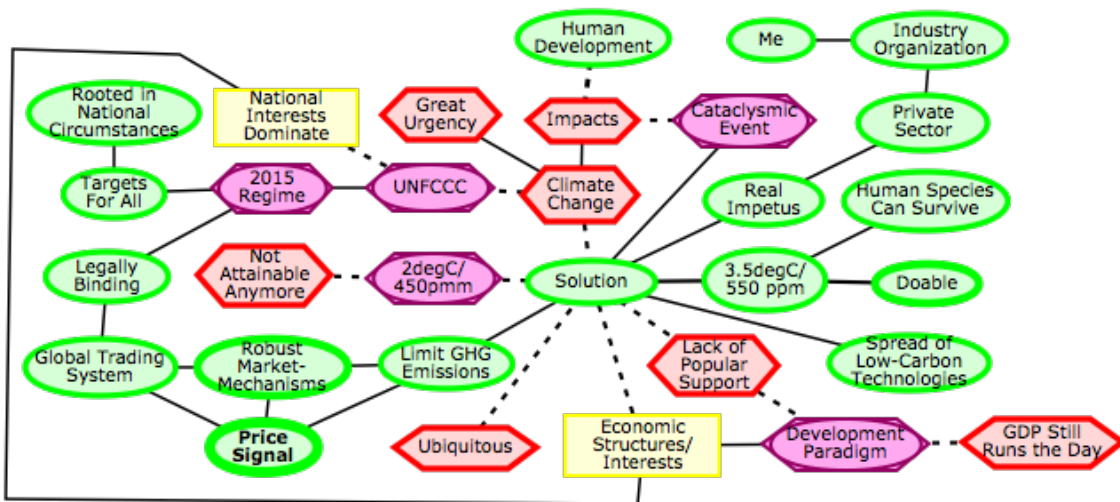
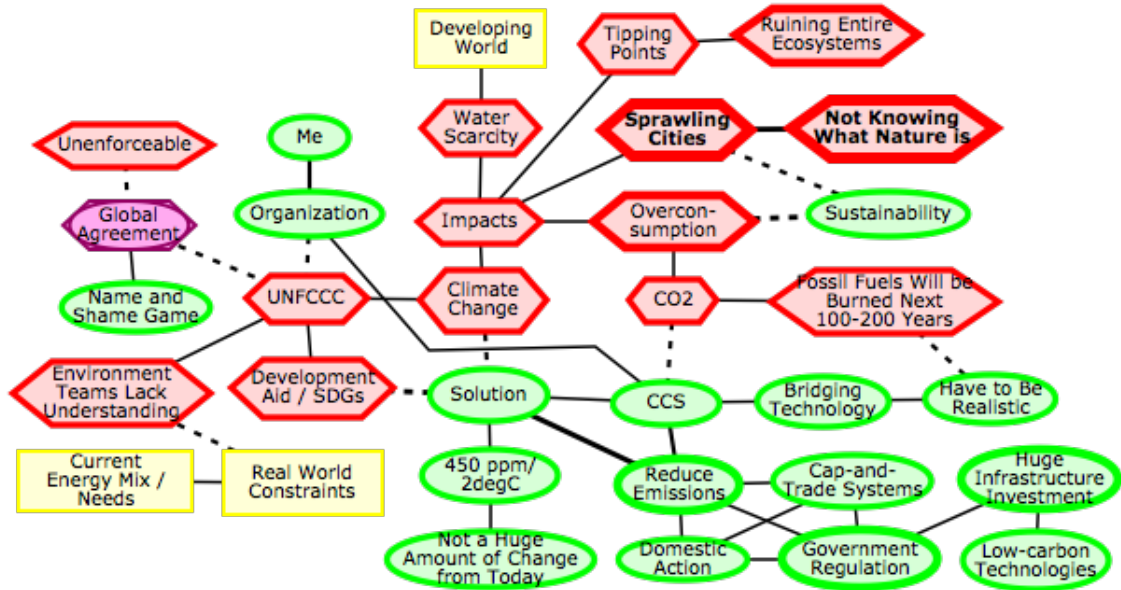


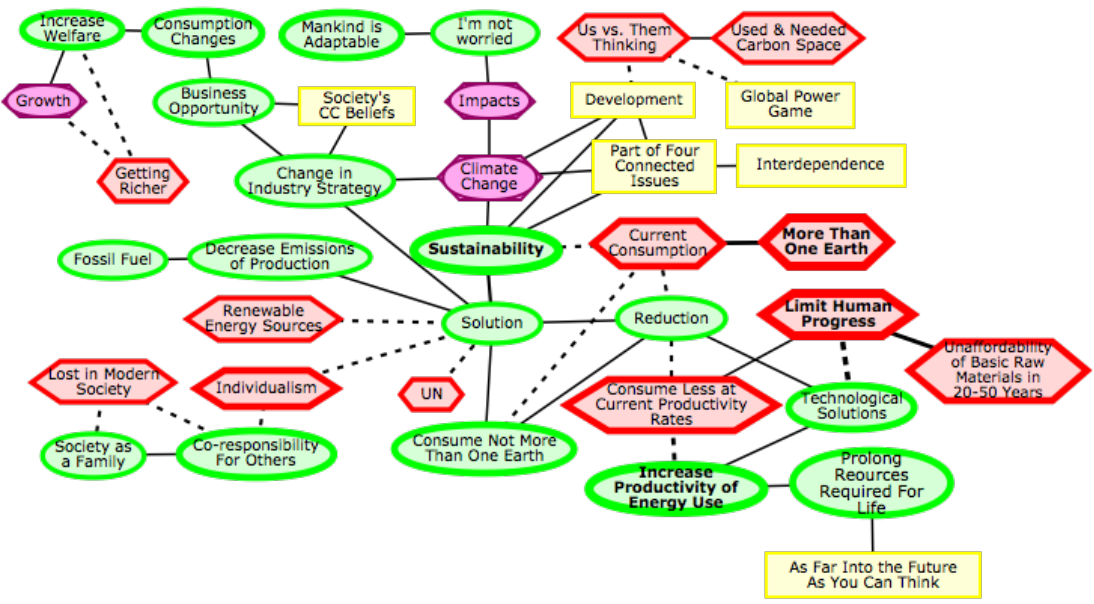
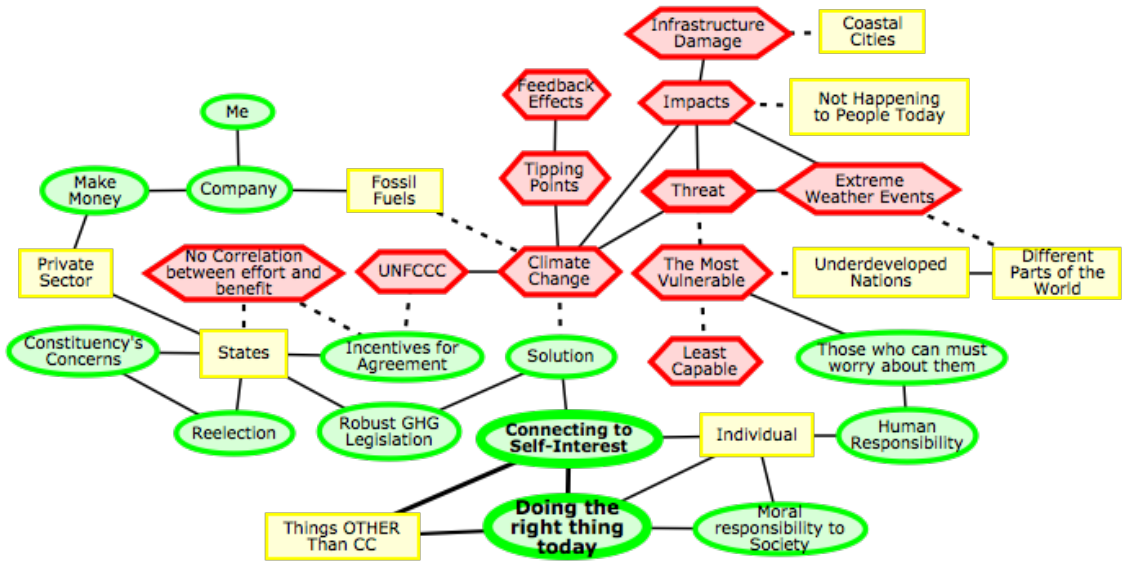


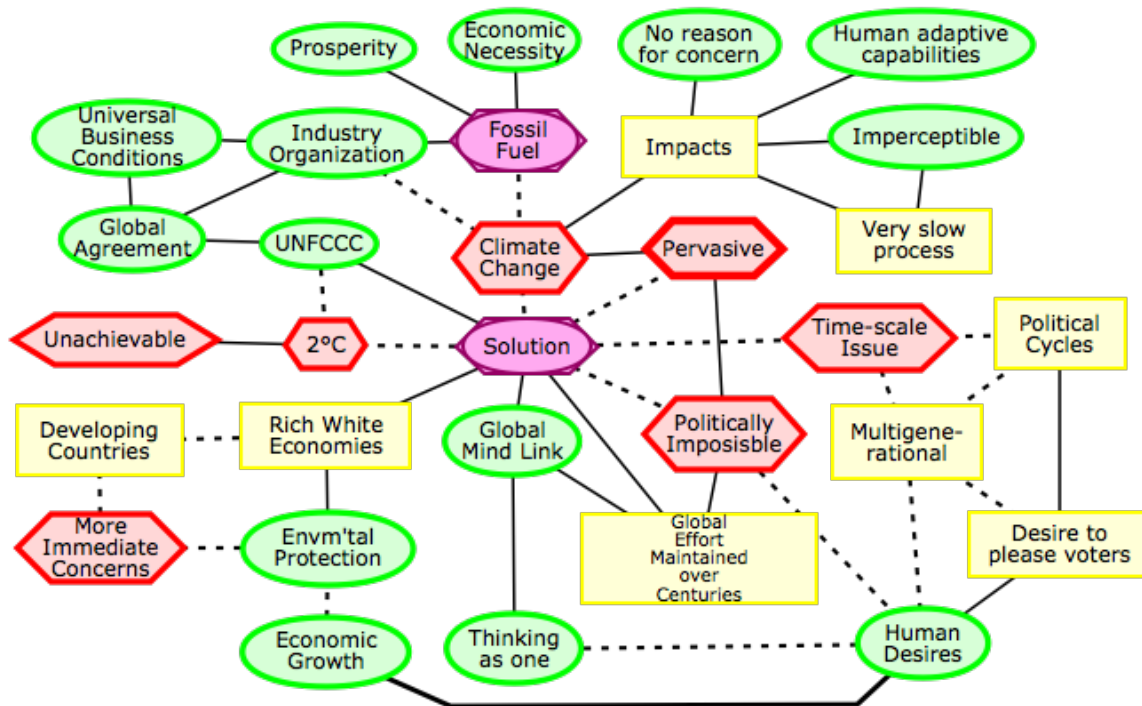




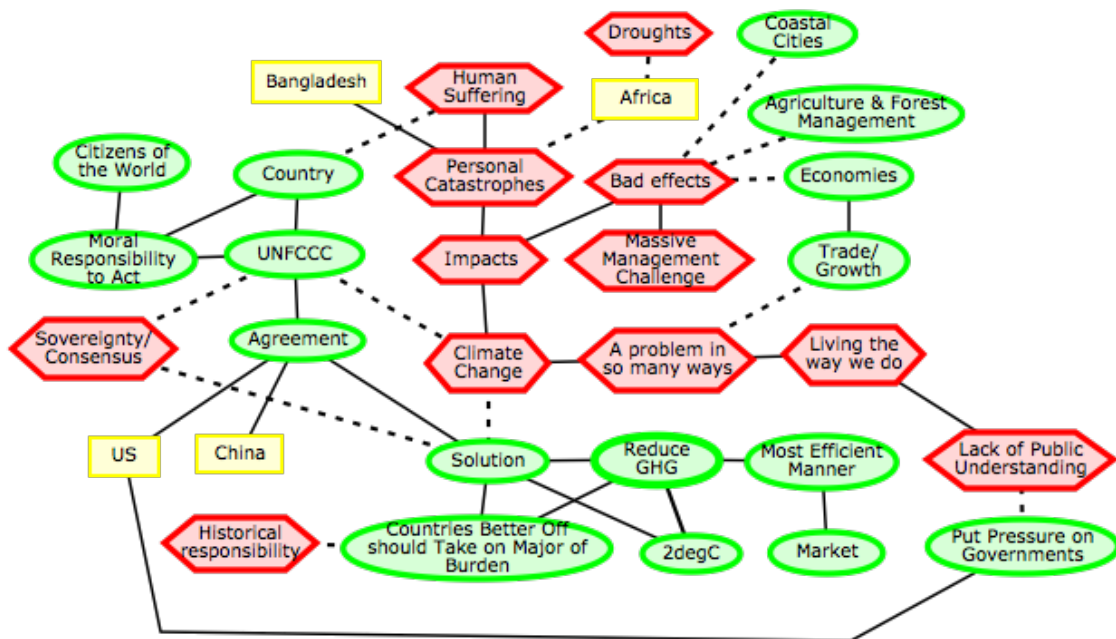


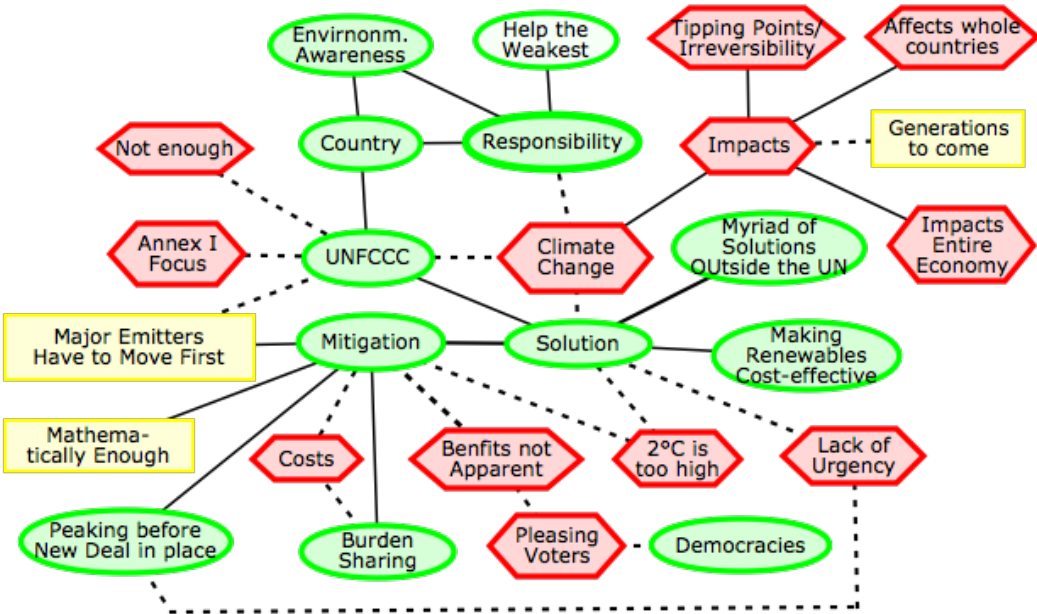


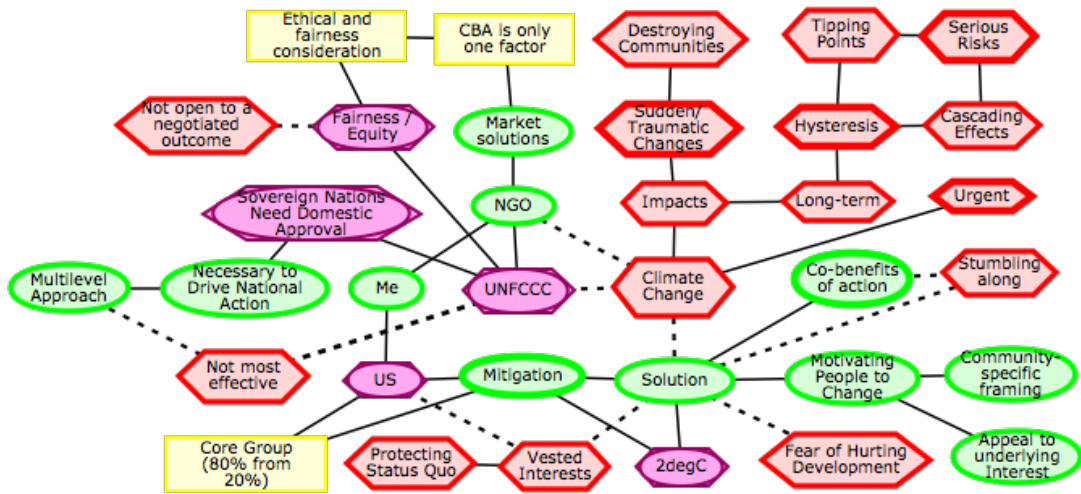
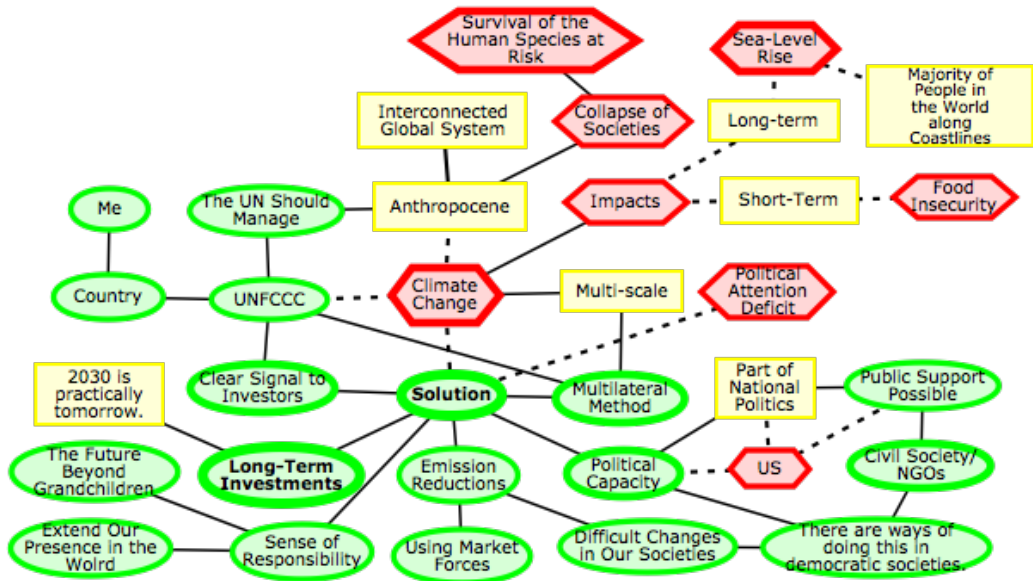


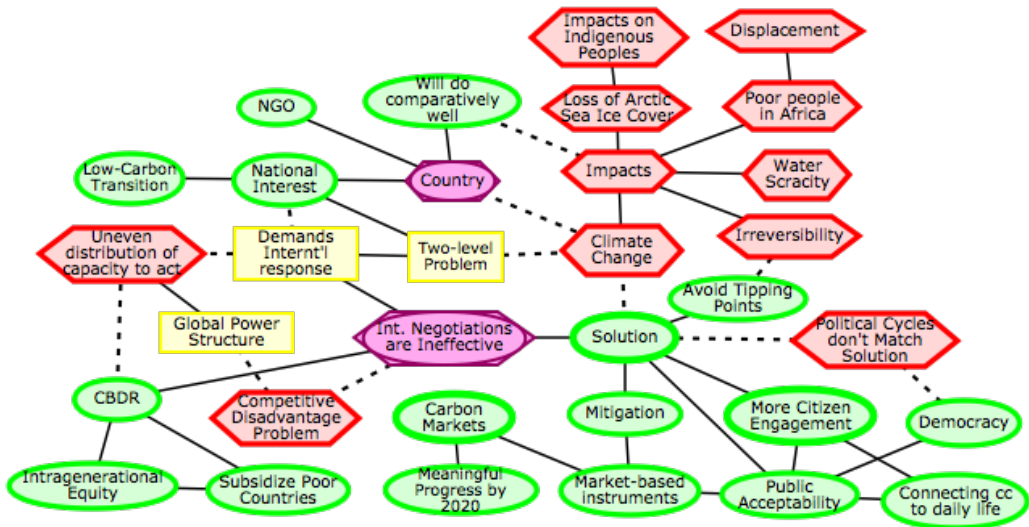


GROUP 5-MELV & Environment & Market NGOs



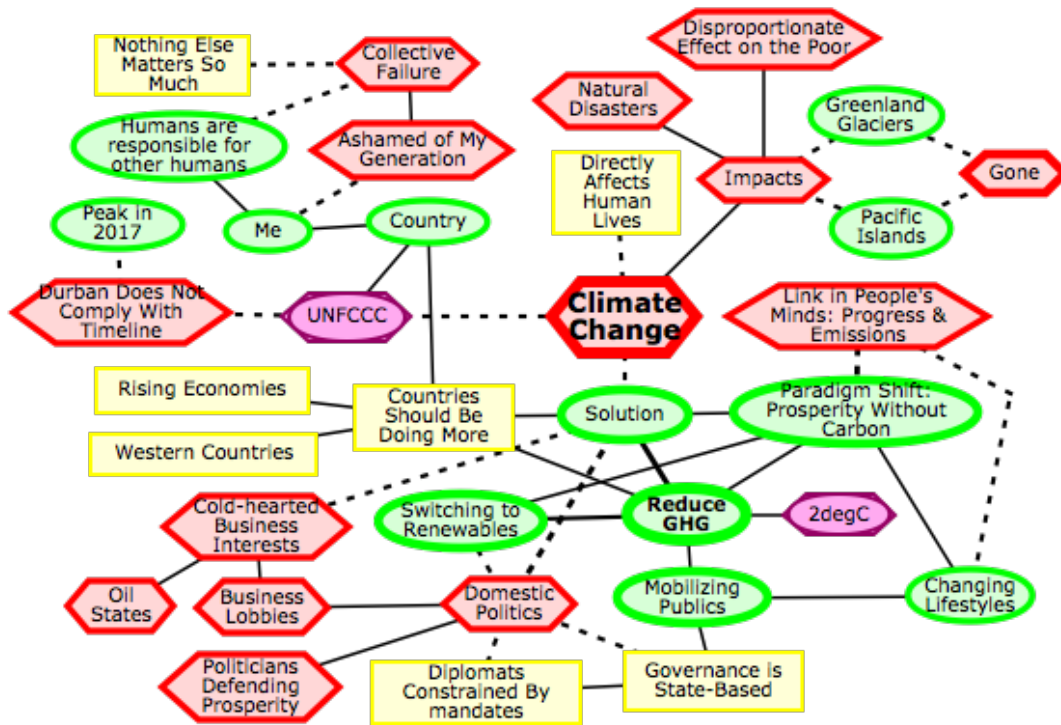






GROUP 6-LELV & Sub-national Government





APPENDIX Ch5-1

Q Method PILOT PROJECT – List of Statements (Q Set)

(Statements marked blue have been removed for the main study.)

1. Climate scientists don't agree about the scientific case for global warming.
2. I don't trust what scientists say about climate change.
3. *Climate scientists are cooking the books to get more research funding.*
4. *We just don't know enough about climate change to design good, effective climate policies.*
5. I do not believe that we will see significant effects of climate change in my lifetime.
6. Hearing about climate science usually leaves me worried about the future and feeling rather helpless.
7. *Climate change can cause many environmental changes, such as Arctic sea ice melting and species loss, but humans do not need to be too concerned about this.*
8. The social consequences of climate change are most worrying: Whole countries and cultures will disappear, many people will suffer from food and water scarcity, or will be forced to migrate.
9. Climate change is an issue for the developing countries.
10. *Climate change is mainly a global energy problem.*
11. The prospect of a cleaner, eco-friendly economy is exciting!
12. Climate change was caused by rich, industrialized countries, but its impacts will hurt poor countries most; and that is not fair.
13. Green anti-climate change policies, and environmentalism more generally, threaten progress and modernity.
14. The prospect of climate change makes me fear for my children's future.
15. An effective climate solution requires the cooperation of all governments around the world.
16. States are the most important players in global climate politics.
17. Even if a new global treaty is signed with ambitious GHG emission reduction targets, most states will simply not be able to implement these targets domestically.
18. Only the 15-20 countries with significant GHG emissions are important for climate negotiations.
19. Our most important concern regarding climate change is domestic action – all our efforts and resources should be concentrated here, rather than internationally.
20. *Unilateral action is pointless.*
21. The power disparities between countries in climate negotiations, like between the US and Tuvalu, make me very upset.
22. The climate problem should be left to the markets.
23. Practical climate initiatives by regions, cities, and local communities have been more successful than international negotiations in the UNFCCC. It is best to leave the development of climate solutions to these communities.
24. I would like to do something about climate change, but individual contributions don't make a difference.
25. Politicians need much stronger voter support and pressure from political movements to create meaningful climate policies.

26. *If the climate is changing it is God's will to change it, and humans cannot do anything about that.*
27. The vested interests blocking solutions are too powerful to allow for any meaningful action on climate change.
28. Nothing will happen before a climate crisis hits.
29. Limiting average global warming to 2°C will be sufficient to prevent major damage.
30. We lack a clearly defined goal for global climate policy.
31. *Mitigation must be viewed as an investment, in which costs incurred now will enable us to avoid the risks of very severe consequences in the future.*
32. *An effective deal is impossible without the US, and China coming on board.*
33. We can easily adapt to climate change, and therefore should not be worried about mitigation.
34. Adaptation and mitigation are complementary and equally important policies.
35. Given the political gridlock on mitigation, we might have to resort to geo-engineering to buy more time for mitigation and adaptation.
36. Geo-engineering can solve the global warming problem much more cost-effectively than mitigation and therefore should receive public funding.
37. *Climate change will not be a problem because technological solutions will become available to fix it.*
38. Economic growth and jobs must take priority over climate concerns.
39. Ideally climate policies would reduce GHG emissions while stimulating economic growth, e.g., in new clean technology sectors.
40. Climate change policy should be based on cost-benefit analysis.
41. The main costs of climate change policies include loss of GDP and jobs, and increased costs for social services, such as unemployment benefits.
42. The main costs of future climate change can simply not be calculated: the loss of human life, the social costs of major migration and food insecurity, the loss of major ecosystems and species extinction don't have price tags.
43. Elected officials have a political responsibility to protect the interests of their constituency - they have to focus on the issues of the present rather than future generations.
44. *I don't know of any benefits of effective climate change policies.*
45. *We should leave it to those countries that will be most affected to solve the climate problem.*
46. Economic growth is the best solution to climate change.
47. Problems that might arise decades from now are not important to me.
48. Investment in climate policies is a poor use of our resources; it makes more sense to do something about poverty, health care and education in the developing world.
49. *My country should aspire to become a leader in clean technology and innovation.*
50. *I am proud that our wealth and happiness has been generated with the help of oil and gas.*
51. The prospect of major environmental change, such as the melting of glaciers or species extinction, is very distressing.
52. I am ashamed that my country is not doing more about climate change.
53. The BASIC countries (Brazil, South Africa, India and China) are aspiring global powers, and should show greater leadership in international climate negotiations.
54. I dedicate my career to solving the climate problem.

55. *The idea that our government might restrict individual freedom and private property for something as uncertain and unreal as climate change is very upsetting.*
56. Based on our shared humanity, our desire for happiness and security, we can find a solution to the climate problem.
57. It's painful to see how little governments and markets care about the environment and the health of the planet.
58. All states have a moral responsibility to contribute to a global climate solution. Governments owe it to the people suffering the consequences of climate disruption.
59. The current generation (of politicians and voters) has a major ethical responsibility to future generations.
60. Future generations are likely to be richer and better off than we are. Since they will be better able to deal with climate change impacts, we do not need to worry about them.
61. I like the idea that climate funding from rich countries will help people in developing countries to adapt to climate change.
62. The rich countries have caused the problem; consequently they have the obligation to fix it.
1. Statement 63 – I believe that we will find a cooperative solution to climate change. Other issues have taken many years of negotiation, too.
63. Climate change is a very depressing issue.
64. Climate change is simply too complex and overwhelming. It is impossible to fully understand, let alone solve, the problem.
65. It is already too late to do anything about climate change.
66. Climate change scares me because I don't know what's going to happen.
67. Climate change is not the only issue we have to deal with. Currently other issues, including sovereign debt and unemployment, are more important than climate change.
68. The focus on winning the next election is the biggest obstacle to finding international agreement.
69. I sometimes wonder how to explain our failure to fix the climate problem to my grandchildren. It makes me feel ashamed.
70. *The threat of losing your job is more tangible and real than the threat of climate change.*
71. I have a hard time imagining or picturing the consequences of climate change for my community and my country.
72. Sometimes gradual processes such as GHG emissions result in sudden, dramatic changes in the environment. The existence of such tipping points makes action even more urgent than previously thought. Avoiding tipping points should become a key climate policy goal.

APPENDIX Ch5-2

Q Method PILOT PROJECT – Summary of Results


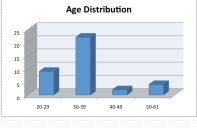
Q Method Pilot Results
The Role of Cognition in Global Climate Politics
 Manjana Milkoreit
 February 8, 2012

Agenda

1. Pilot Participants – Demographics
2. Pilot Participants – General Attitudes
3. Q Analysis – Main Results
 - a) 4 Perspectives/Narratives
 - b) Factors & Thought Communities
4. Adjustments to the Study Design
 - a) Instructions
 - b) Statements

1. Pilot Participants - Demographics

- 44 Participants from 10 countries
 - 29 Men and 12 women (70/30%)
 - 3 participants without demographic information
- Age range 22-61
- Professions:
 - 24 Academics (grad students, researchers, professors),
 - 5 Consultants/Analysts,
 - 3 Lawyers/Judges,
 - 9 others (incl. CEO, Director in Foundation, Project Manager, ...)
- Political Spectrum:
 - 28 Left/liberal, "progressive" and center-left,
 - 1 Center,
 - 2 Right/conservative.

1a. Thought Communities

1. Important?
2. Tractable?
3. High national emissions?
4. High national vulnerability?

- YYY – (Reasonable) Optimists
- YYN – Moral optimists
- YNY – Optimists without a choice
- NYY/NY – Powerful Pessimists (divide?)
- YNN/YNNN – Powerless Pessimists
- NNNY/NYYY/NYYN – Negligent Deniers

1b. Pilot Participants – Thought Communities

(Reasonable) Optimists (YYYY)	Moral Optimists (YYN)	Optimists without a choice (YNY)	Powerful Pessimists (NYY/NY)	Powerless Pessimists (YNN/YNNN)	Negligent Deniers (NNY/NNYY)
Canada	Germany	South Africa	Canada		US
Canada	Germany		Canada		
Canada	Germany		Canada		
Canada	Germany		Canada		
Germany	Germany		Canada		
Germany	Germany		Germany		
Germany	Germany		Germany		
Sweden	Canada		Germany		
US	Canada		Germany		
	Norway		Germany		
	Belgium		Germany		
	UK		US		
			US		
			Ireland		
			Australia		
10	13	1	16	0	1

2. Pilot Participants - General Attitudes

- Generally strong disagreement (-5) with the statement on **God's will**,
- Everyone is **excited** about a "greener future" and aspire to national leadership in clean technology,
- No participants would trust the **markets** (or economic growth) to solve the problem (highest score +1, 0 score -3).
- Nobody thought that **sub-national actors** could solve the problem (highest score +2, average score -1),
- Feelings of **helplessness** are limited (0 score +1),
- Less than 1/3 fear for their **children's future** (0 score +1; 14 score +3 or more),
- Few find it very **depressing** (0 score +1) or too **complex** (0 score -1),
- Few felt strongly about **power disparities** in international negotiations (0 score +1),
- Less than half believe that the **rich countries** have a special responsibility (scores +3 or more),
- Few considered **vested interests** to be important (0 score +1),
- Few though 2°C was a "sufficient" goal (0 score -1),
- More than half are worried about **tipping points** (26 scored +3 or more).

3. Q Analysis: 4 Main Viewpoints

Factor Arrays						
No.	Statement	No.	1	2	3	4
1	Climate scientists don't agree about the scientific case for	1	-2	-4	0	1
2	I don't trust what scientists say about climate change.	2	-4	-4	-2	-1
3	Climate scientists are cooking the books to get more research	3	-4	-5	-3	1
4	We just don't know enough about climate change to design good	4	-1	-2	-1	-2
5	I do not believe that we will see significant effects of cli	5	-2	-3	-2	-4
6	Hearing about climate science usually leaves me worried abou	6	1	0	0	2
7	Climate change can cause many environmental changes, such as	7	-2	-5	-3	-5
8	The social consequences of climate change are most worrying:	8	4	4	5	2
9	Climate change is an issue for the developing countries.	9	0	1	-5	0
10	Climate change is mainly a global energy problem.	10	1	1	0	0
11	The prospect of a cleaner eco-friendly economy is exciting!	11	5	4	4	3
12	Climate change was caused by rich, industrialized countries,	12	1	4	3	2
13	Green anti-climate change policies, and environmentalism mor	13	-4	-4	-4	-3
14	The prospect of climate change makes me fear for my children	14	2	2	1	4
15	An effective climate solution requires the cooperation of al	15	4	2	4	3
16	States are the most important players in global climate poli	16	1	2	4	0
17	Even if a new global treaty is signed with ambitious GHG emi	17	0	0	0	0
18	Only the 15-20 countries with significant GHG emissions are	18	-2	0	-1	0
19	Our most important concern regarding climate change is domes	19	-1	-1	-1	-1
20	Unilateral action is pointless.	20	0	-1	3	-2
21	The power disparities between countries in climate negotiati	21	1	0	2	1
22	The climate problem should be left to the markets.	22	-5	-3	-4	-4

3a. Factor 1

- +5 Statements**
 - My country should aspire to become a leader in clean technology and innovation.
 - The prospect of a cleaner eco-friendly economy is exciting!
 - The main costs of future climate change can simply not be calculated: the loss of human lives, ...
- 5 Statements**
 - The climate problem should be left to the markets.
 - We should leave it to those countries that will be most affected to solve the climate problem.
 - If the climate is changing it is God's will to change it, and humans can do nothing about it.
- Statements ranked higher than other factors**
 - An effective climate solution requires the cooperation of all governments. (-4)
 - I am ashamed that my country is not doing more about climate change. (+3)
 - The focus on winning the next election is the biggest obstacle to finding int. agreement. (+3)
- Statements ranked lower than other factors**
 - I don't trust what scientists say about climate change. (-4)
 - Climate change was caused by rich, industrialized countries, but its impacts will be ... (+4)
 - Only the 15-20 countries with significant GHG emissions are important for climate negotiations. (-2)
 - I believe that we will find a cooperative solution to climate change. Other issues have taken many years of negotiation too. (-4)

3a. Factor 1: Educated Confusion (7)

While these individuals place greatest emphasis on a **positive** vision of **cleaner future**, they are also most **pessimistic** about the chances of finding **international agreement** on climate change. The strongest theme is the emphasis on the shared responsibility by "all governments", and the rejection of a special role for any of the other actors: mentioned (individuals, markets, US & China, BASIC, 15-20 big emitters, rich countries, sub-national actors, vested interests).

There is a significant concern with **political short-termism** as a key obstacle to action. However, they do *not* consider the state to be the most important actor, which leaves me (them?) puzzled who can and should address this problem (location of agency?). At the same time they feel **ashamed** that their country is not doing more.

This group **strongly trusts** climate **scientists**, but they find it hard to envision the future and **fear** it more than the other groups. They are least content with the 2C policy goal, and are most opposed to geo-engineering.

Demographics: Majority is Canadian, almost all group members are academics (graduate student, post-doc, professor); all self-identified liberals, most in the age range between 20 and 40.

3b. Factor 2

- +5 Statements**
 - My country should aspire to become a leader in clean technology and innovation.
 - All states have a moral responsibility to contribute to a global climate solution.
 - The current generation (of politicians and voters) has a major ethical responsibility to future generations.
- 5 Statements**
 - Climate scientists are cooking the books to get more research funding.
 - If the climate is changing it is God's will to change it, ...
 - Climate change can cause many environmental changes, ..., but humans don't need to worry about that.
- Statements ranked higher than other factors**
 - Climate change was caused by rich, industrialized countries, but the impacts ... and that's not fair. (+4)
 - Climate change policy should be based on cost-benefit analysis. (+2)
 - Adaptation and mitigation are complementary and equally important. (+3)
- Statements ranked lower than other factors**
 - Climate scientists don't agree about the scientific case for climate change. (-4)
 - I don't know of any benefits of effective climate change policies. (-4)
 - Hearing about climate science usually leaves me worried about the future ... (0)

3b. Factor 2: Fairness Champions (29)

This group places strong emphasis on **moral obligations** (of states, politicians and voters), including to future generations, and **fairness** (e.g., unfair distribution of causes and consequences). However, they are not upset about existing power disparities (0).

They strongly disagree with claims about scientific fraud or disagreement and a role for God. They are the strongest supporters of **CBA**, and consider **economic growth** desirable.

They do not identify who should be responsible for addressing climate change. The statement on "all governments" gets the lowest score across all factors, but **BASIC countries** should do more (+3). Politicians need stronger **voter support**, but vested interests are not singled out as problem.

This group is concerned about the environment (e.g., distress over environmental change). At the same time they show the lowest level of worry about the future and helplessness (0). Fear does not seem to play a role; neither do they feel that the problem is complex and overwhelming.

Demographics: biggest factor, 1/3 is German and 1/3 Canadian, almost 2/3 are academics (graduate student, post-doc, professor).

3c. Factor 3

- +5 Statements**
 - The social consequences of climate change are most worrying: the disappearance of entire states and cultures, ...
 - Politicians need much stronger voter support and pressure from political movements ...
 - The current generation (of politicians and voters) has a major ethical responsibility to future generations.
- 5 Statements**
 - Climate change is an issue for the developing countries.
 - Economic growth and jobs must take priority over climate concerns.
 - We should leave it to those countries that will be most affected to solve the climate problem.
- Statements ranked higher than other factors**
 - States are the most important players in global climate politics.
 - Nothing will happen before a climate crisis hits.
 - Given the political gridlock on mitigation, we might have to resort to geo-engineering.
- Statements ranked lower than other factors**
 - The prospect of climate change makes me fear for my children's future.
 - Elected officials have a political responsibility to ... focus on the issues of the present rather than future generations.
 - Climate change is a very depressing issue

3c. Factor 3: Liberal Optimists (2)

This group considers the (community of all **state(s)**) to be responsible for solving the climate problem. They think the **BASIC** countries should show greater leadership, and have little confidence that **sub-national actors** can contribute significantly to a solution.

Group members are not concerned about the environment, but very worried about the **social impacts** of climate change. They show the greatest but still moderate (+2) concern about power disparities in the international system. They strongly **disagree with a prioritization of growth and jobs** over climate change and do not want to leave it to the markets.

They place more emphasis than others on the fact that nothing might happen until a **climate crisis** hits. They identify "winning the next election" as a major obstacle to international agreement and strongly disagree with the statement that elected officials have no obligations to future generations.

Worried about the political gridlock they are the only group showing moderate support for the need to resort to **geo-engineering** (+2).

However, they remain **optimists**: they neither fear the future nor find the issue depressing, and strongly disagree with the notion that it might already be too late to solve the problem. They also show least concern about tipping points and are fairly confident (+2) that the international community will find a solution.

3d. Factor 4

- +5 Statements**
 - Ideally climate policies would reduce GHG emissions while stimulating economic growth, e.g., in new clean technology sectors.
 - The main costs of future climate change can simply not be calculated, e.g., ...
 - The prospect of major environmental change, such as ... is very distressing.
- 5 Statements**
 - Climate change can cause many environmental changes, such as ... but humans don't need to worry about that.
 - Problems that might arise decades from now are not important to me.
 - If the climate is changing it is God's will to change it, and ...
- Statements ranked higher than other factors**
 - Climate scientists don't agree about the scientific case for cc. (+1)
 - Hearing about climate science usually leaves me worried about the future and feeling rather helpless. (+2)
 - The prospect of climate change makes me fear for my children's future. (+4)
- Statements ranked lower than other factors**
 - The social consequences of climate change are most worrying: ... (+2)
 - Climate change will not be a problem because technological solutions will ... (-4)
 - The rich countries have caused the problem; consequently they have the obligation to fix it (-1).

3d. Factor 4: Emotional Outlook (6)

These individuals take a **longer-term view** and see a strong link between environmental change and social disruption. The need to address the question of **growth** when trying to reduce GHG is very dominant in their view. This group's concern about the social effects of climate change exists despite a comparatively **low level of trust in scientists** and scientific consensus. They are concerned about the lack of a clearly defined policy goal and consider the 2C target as insufficient to prevent major harm.

This group experiences strong **negative emotions**: thinking about major environmental change is very distressing and climate change is a very **depressing** issue. They are most worried about the future and experience more **fear** for themselves and their children's future than other factors. These feelings might be rooted in their lack of confidence in scientific information.

This group does not identify a specific set of actors as responsible for solving the problem, but they don't believe that (individual) states can solve it. Placing the statement about states as most important players (and sub-state actors) at 0 could indicate ambivalence: **states** are considered **important but cannot solve the problem alone**. In that sense they see a role for individuals, and probably private actors. They strongly support the idea that the **BASIC** countries should do more, and reject the suggestion that the rich countries have a special responsibility to address climate change because they caused the problem.

4. Adjustments to the Study Design

- Change Instructions**
 - Add a suggestion to work with a sheet of paper and take notes regarding the importance of statements
- Delete Statements (15)**
 - Climate scientists are cooking the books to get more research funding.
 - We just don't know enough about climate change to design good, effective climate policies.
 - Climate change can cause many environmental changes, such as Arctic sea ice melting and species loss, but humans do not need to be too concerned about this.
 - If the climate is changing it is God's will to change it, and humans cannot do anything about that.
 - Climate change is mainly a global energy problem.
 - An effective deal is impossible without the US, and China coming on board.
 - Unilateral action is pointless.
 - We should leave it to those countries that will be most affected to solve the climate problem.
 - My country should aspire to become a leader in clean technology and innovation.
 - I don't know of any benefits of effective climate change policies.
 - The idea that our government might restrict individual freedom and private property for something as uncertain and unreal as climate change is very upsetting.
 - The threat of losing your job is more tangible and real than the threat of climate change.
 - I am proud that our wealth and happiness has been generated with the help of oil and gas.
 - Mitigation must be viewed as an investment, in which costs incurred now will enable us to avoid the risks of very severe consequences in the future.
 - Climate change will not be a problem because technological solutions will become available to fix it.

4. Adjustments to the Study Design

- Add Statements (5)**
 - Nature of the problem:** "Climate change will result in violence and human deaths."
 - Multilevel interactions:** "Neither states nor markets nor civil society can solve this problem on their own – climate change requires coordinated action at all of these different levels of action."
 - Agency:** "A key element in solving the climate problem is the need for fundamental value change within our societies."
 - Policy Options:** "Taxes – whether globally or domestically – and other policies that constrain private property rights are simply not politically acceptable in our system."
 - Hope:** "There are moments when I lose all hope that we can solve this problem."
- Change Statements (2)**
 - Climate Scientists don't agree about the scientific case for global warming. → There is no agreement among scientists about the causes and consequences of climate change.
 - We can easily adapt to climate change, and therefore should not be worried about mitigation. → Since the climate is going to change, we should be more concerned about adaptation.

APPENDIX Ch5-3

Q Method – List of Statements (Q Set)

Causes of Climate Change

1. Human-released greenhouse gases are causing significant climate change.
2. I don't trust what scientists say about climate change.
3. Anti-climate change policies threaten progress and modernity.

Consequences of Climate Change

4. I do not believe that we will see significant effects of climate change in my lifetime.
5. The social consequences of climate change are most worrying: Whole countries and cultures will disappear; many people will suffer from food and water scarcity, or will be forced to migrate.
6. Climate change is mainly an issue for the developing countries.
7. Climate change was caused by rich, industrialized countries, but its impacts will hurt poor countries most – this asymmetry is unfair.
8. Climate change will result in violence and human deaths.

Actors and Agency

9. An effective climate solution requires the cooperation of all governments around the world.
10. States are the most important players in global climate politics.
11. Even if a new international treaty is signed with ambitious mitigation targets, many states will simply not be able to implement these targets domestically.
12. Only a small number of countries with significant GHG emissions are important for climate negotiations.
13. All our efforts and resources to combat climate change should be concentrated domestically, rather than internationally.
14. The power disparities between countries in climate negotiations make me very upset.
15. The climate problem should be left to the markets.
16. It is best to leave the development of climate solutions to regions, cities, and local communities - they have been much more successful than UNFCCC negotiations.
17. Individual contributions don't make a difference when it comes to climate change.
18. Politicians need much stronger voter support and pressure from political movements to create meaningful climate policies.
19. The vested interests blocking solutions are too powerful to allow for any meaningful action on climate change.
20. Nothing will happen before a climate crisis hits.
21. Neither states nor markets nor civil society can solve this problem on their own – climate change is a multilevel problem and requires action at all of these different levels.
22. A key element in solving the climate problem is the need for fundamental value change within our societies.

23. Based on our shared humanity, our desire for happiness and security, we can find a solution to the climate problem.
24. God has made us stewards of the Earth, giving us the ability and responsibility to keep the planet healthy.

Policy Goals and Options

25. The prospect of a cleaner, eco-friendly economy is exciting.
26. Limiting average global warming to 2°C will be sufficient to prevent major damage.
27. We lack a clearly defined goal for global climate policy.
28. Since the climate is going to change we should be more concerned with adaptation.
29. Adaptation and mitigation are complementary and equally important policies.
30. Given the political gridlock on mitigation, we might have to resort to geo-engineering to buy more time for mitigation and adaptation.
31. Geo-engineering can solve the global warming problem much more cost-effectively than mitigation.
32. Taxes – whether globally or domestically – and other policies that constrain private property rights are simply not politically acceptable in our system.

Climate Economics and Development

33. Economic growth and jobs must take priority over climate concerns.
34. Ideally climate policies would reduce GHG emissions while stimulating economic growth.
35. Climate change policy should be based on cost-benefit analysis.
36. The main costs of climate change policies include loss of GDP and jobs.
37. The main costs of future climate change can simply not be calculated: the loss of human life, food insecurity, or species extinctions don't have price tags.
38. Economic growth is the best solution to climate change.
39. Investment in climate policies is a poor use of our resources; it makes more sense to do something about poverty, health care and education in the developing world.

Identity

40. The prospect of major environmental change, such as the melting of glaciers or species extinction, is very distressing.
41. I am ashamed that my country is not doing more about climate change.
42. The BASIC countries (Brazil, South Africa, India and China) should show greater leadership in international climate negotiations.
43. I dedicate my career to solving the climate problem.
44. It is disappointing to see how little governments and markets care about the environment and the health of the planet.
45. My government is a very constructive player in international affairs.

Ethics and Justice

46. Elected officials have a political responsibility to protect the interests of their constituency - the present rather than future generations.

47. Problems that might arise decades from now are not important to me.
48. All states have a moral responsibility to contribute to a global climate solution.
49. The current generation (of politicians and voters) has a major ethical responsibility to future generations.
50. Future generations are likely to be richer and better off than we are, and better able to deal with climate change.
51. I fully support climate funding – financial flows from the rich to the poor to help them cope with climate change.
52. The rich countries have caused the problem; consequently they have the obligation to fix it.

Special Characteristics (Hope, Uncertainty, Myopia, Imperceptibility, Tipping Points)

53. Contemplating climate change usually leaves me feeling rather helpless.
54. Climate change makes me fear for my children's future.
55. I believe that we will find a cooperative solution to climate change. Other issues have taken many years of negotiation, too.
56. Climate change is a very depressing issue.
57. Climate change is simply too complex and overwhelming. It is impossible to fully understand, let alone solve, the problem.
58. It is already too late to do anything about climate change.
59. There are moments when I lose all hope that the UNFCCC process can solve this problem.
60. Climate change scares me because I don't know what's going to happen.
61. Climate change is not the only issue we have to deal with and other issues are often more urgent.
62. The focus on winning the next election is the biggest obstacle to finding international agreement.
63. I sometimes wonder how to explain our failure to fix the climate problem to my grandchildren.
64. I have a hard time imagining the consequences of climate change for my community and my country.
65. Sometimes gradual processes such as GHG emissions result in sudden, dramatic changes in the environment. The existence of such climatic tipping points makes action even more urgent than previously thought. Avoiding tipping points should become a key climate policy goal.

APPENDIX Ch5-4

Q Method – Instructions and Questions

I. INSTRUCTIONS

STEP 1 – Reading and Pre-Sorting Statements

In a moment you will be shown a set of opinion statements (on climate change and international cooperation) on 65 'cards'. These statements have been drawn from a broad set of sources and reflect various perspectives on the climate issue. The statements show up in a random order, but they fall in roughly eight different categories: (1) climate science, (2) nature of the problem, (3) actors & agency, (4) policy goals and options, (5) economics & development, (6) identity, (7) ethics and justice, (8) special characteristics. Later you will be asked to what extent you agree or disagree with these statements on a scale from -5 to +5.

Please read the statements on the cards carefully and split them up into three piles: a pile for statements you tend to disagree with (on the left), a pile for statements you tend to agree with (on the right), and a pile for the rest (in the middle). The middle pile should contain statements that are not very meaningful to you or that you feel conflicted about (you cannot decide whether you agree or disagree with them).

Do not worry about the number of statements in each pile. The distribution is not relevant. For example, you could place 10 statements in the “agree” pile, 12 in the “uncertain” pile and the rest in the “disagree” pile.

You can either drag the cards into one of the three piles or press 1, 2, 3 on your keyboard. Changes can be made later.

You might find it useful to work with a sheet of paper and note down the values (between -5 and +5) you might later assign to these statements. You could also note your thoughts on statements you find hard to place. At the end of the survey you will be asked about those.

Please note the following abbreviations and definitions:

GHG – Greenhouse gas emissions,

Mitigation – Measures to slow down and prevent climate change, mainly GHG emissions reductions and energy efficiency improvements,

Adaptation – Measures to adjust to climatic changes, e.g., building defenses against sea-level rise, growing different (e.g., more drought-resistant) crops, migrating,

Geo-engineering – Planned (engineered) large-scale interventions to change the climate (e.g., cloud-whitening, air capture and storage of carbon dioxide, blocking (some) incoming sunlight by spraying small particles (aerosols) into the stratosphere.

IMPORTANT: If you want to read this instruction or the abbreviations and definitions a second time, press the help-button at the bottom right corner.

STEP 2 – Ranking the Statements

Next you will be shown a grid (-5 to +5) and the statements in the pre-sorted piles at the bottom of the page. The goal is to place all the cards in the grid above based on your level of (dis)agreement with them. What matters most is the final composition of the grid, not how you got there. Below I suggest one way to approach this ranking. If you choose another approach, please make sure that you spend some time in the end to move statements to their best place based on your beliefs (Step 3).

Please read the statements in your "Agree"-pile again. Select the TWO statements that you AGREE WITH MOST and place them on right side of the score sheet below the "+5". It does not matter which of these you place at the top or at the bottom. Next, from the remaining pile select the four statements that you AGREE WITH MOST and place them in the four spots below the "+4". Proceed until all statements you agree with have been placed on the grid.

Next, focus on the cards in the "Disagree"-pile. Please read through the cards again and - just like before - select the two statements that you DISAGREE WITH MOST and place them on the left side of the score sheet below the "-5". Proceed until all statements you disagree with have been placed on the grid.

Finally, look at the remaining cards in the “Neither/Conflicted” pile. Please read through these statements once again and place the cards in the remaining spots on the score sheet.

Please note that it is possible that you end up placing some statements that you agree with in the “0” column, or even in the “disagree with” area of the grid, or vice versa. This is not a problem, since the purpose of the grid is to establish the relative agreement with and importance of these statements. Please email me (manjana@mac.com) if you experience serious problems with this issue.

IMPORTANT: If you want to read this instruction a second time, press the help-button at the bottom right corner.

STEP 3 – Check and Adjust Your Ranking

You have now placed all cards onto the grid. Please look over your grid once more for a final check and shift cards if you want to. You can drag statements out of their current location back into one of the three piles, and then relocate from there or swap cards directly.

STEP 4 – Help us Interpret Your Ranking

Please explain why you have placed your selected statements under “+5” (most agree with) and “-5” (most disagree with).

STEP 5 – Some Final Questions

Almost done! The final step consists of a number of questions about yourself and about your ranking. This part might be the most valuable for understanding your ranking and how your

point of view compares with other. Therefore any brief comment would be greatly appreciated!

Questions 1-4 and 6-11 are required to finish the Q Sort; all other questions are voluntary.

II. QUESTIONS (POST-SORTING)

General Questions

1. Name
2. Nationality
3. Current Occupation
4. Country of Residence
5. Age

Participant Group

1. Do you think climate change is an important problem, i.e., among the top five issues global leaders should worry about?
2. Is an international agreement necessary to address climate change?
3. Are you optimistic that climate change will be addressed effectively with cooperative international policies, i.e., is it a tractable problem?
4. Does your home country have comparatively high GHG emissions?
5. Do you expect your home country will be strongly, negatively affected by climate change?
6. Do you expect that you will be personally, negatively affected by climate change?

Interpretation Questions

1. Why did you place statements X and Y as most agree with?
2. Why did you place statements A and B under most disagree with?
3. Was there a statement missing that you needed to represent your views on climate change and international cooperation?
4. Which statement did you struggle most with, i.e., which one was hardest to place?
5. Is there a statement in the "0" column that is important to you, but that you feel conflicted about, i.e., you were not sure whether to place it in agree with/disagree with? Why?

APPENDIX Ch5-5

Q Method - Factor Scores

Statement		Factor Scores					
		A	B	C	D	E	F
1	Human-released greenhouse gases are causing significant climate change.	3	5	5	4	5	3
2	I don't trust what scientists say about climate change.	-2	-5	-5	-4	-4	-4
3	Anti-climate change policies threaten progress and modernity.	-3	-1	0	-1	-1	3
4	I do not believe that we will see significant effects of climate change in my lifetime.	-4	-4	-3	-2	-3	-4
5	The social consequences of climate change are most worrying: Whole countries and cultures will disappear; many people will suffer from food and water scarcity, or will be forced to migrate.	3	2	0	3	3	2
6	Climate change is mainly an issue for the developing countries.	-5	-4	-4	-5	-5	-3
7	Climate change was caused by rich, industrialized countries, but its impacts will hurt poor countries most – this asymmetry is unfair.	1	3	1	4	5	3
8	Climate change will result in violence and human deaths.	1	3	1	1	2	3
9	An effective climate solution requires the cooperation of all governments around the world.	5	0	4	3	3	1
10	States are the most important players in global climate politics.	0	-1	1	0	1	2
11	Even if a new international treaty is signed with ambitious mitigation targets, many states will simply not be able to implement these targets domestically.	2	0	-1	0	-1	0
12	Only a small number of countries with significant GHG emissions are important for climate negotiations.	-4	2	-3	-3	-1	-1
13	All our efforts and resources to combat climate change should be concentrated domestically, rather than internationally.	-4	-1	-4	-2	-2	-2
14	The power disparities between countries in climate negotiations make me very upset.	1	0	-2	2	2	4
15	The climate problem should be left to the markets.	-3	-2	1	-5	-4	-4
16	It is best to leave the development of climate solutions to regions, cities, and local communities - they have been much more successful than UNFCCC negotiations.	-1	-1	-2	-1	-1	-1
17	Individual contributions don't make a difference when it comes to climate change.	-1	-2	-2	-3	-2	-1
18	Politicians need much stronger voter support and pressure from political movements to create meaningful climate policies.	3	2	4	5	4	4
19	The vested interests blocking solutions are too powerful to allow for any meaningful action on climate change.	2	1	-2	2	2	1
20	Nothing will happen before a climate crisis hits.	0	1	-1	-1	-1	0

21	Neither states nor markets nor civil society can solve this problem on their own – climate change is a multilevel problem and requires action at all of these different levels.	4	4	4	4	4	1
22	A key element in solving the climate problem is the need for fundamental value change within our societies.	5	0	3	5	1	5
23	Based on our shared humanity, our desire for happiness and security, we can find a solution to the climate problem.	1	1	2	3	2	0
24	God has made us stewards of the Earth, giving us the ability and responsibility to keep the planet healthy.	2	-4	-2	0	1	1
25	The prospect of a cleaner, eco-friendly economy is exciting.	3	4	4	3	2	4
26	Limiting average global warming to 2°C will be sufficient to prevent major damage.	-3	-2	-1	-2	-2	-1
27	We lack a clearly defined goal for global climate policy.	0	0	0	1	-1	-1
28	Since the climate is going to change we should be more concerned with adaptation.	3	1	-1	-1	3	0
29	Adaptation and mitigation are complementary and equally important policies.	4	3	2	1	2	1
30	Given the political gridlock on mitigation, we might have to resort to geo-engineering to buy more time for mitigation and adaptation.	-2	0	0	-2	0	0
31	Geo-engineering can solve the global warming problem much more cost-effectively than mitigation.	-1	-3	-2	-3	-2	-3
32	Taxes – whether globally or domestically – and other policies that constrain private property rights are simply not politically acceptable in our system.	0	-1	-3	-2	-3	-3
33	Economic growth and jobs must take priority over climate concerns.	-2	-3	-2	-3	-2	-2
34	Ideally climate policies would reduce GHG emissions while stimulating economic growth.	2	4	3	1	3	1
35	Climate change policy should be based on cost-benefit analysis.	-3	0	2	-2	-1	1
36	The main costs of climate change policies include loss of GDP and jobs.	-3	-1	0	-1	-2	-2
37	The main costs of future climate change can simply not be calculated: the loss of human life, food insecurity, or species extinctions don't have price tags.	1	2	2	2	1	-2
38	Economic growth is the best solution to climate change.	-5	-2	1	-3	-3	-2
39	Investment in climate policies is a poor use of our resources; it makes more sense to do some-thing about poverty, health care and education in the developing world.	-2	-3	-5	-2	-3	-2
40	The prospect of major environmental change, such as the melting of glaciers or species extinction, is very distressing.	1	3	2	2	3	1
41	I am ashamed that my country is not doing more about climate change.	-2	2	-3	1	1	4
42	The BASIC countries (Brazil, South Africa, India and China) should show greater leadership in international climate negotiations.	4	1	3	1	1	-1
43	I dedicate my career to solving the climate problem.	-1	2	3	0	0	0
44	It is disappointing to see how little governments and markets care about the environment and the health of the planet.	2	1	0	3	1	2
45	My government is a very constructive player in international affairs.	0	-3	2	-1	-3	-5
46	Elected officials have a political responsibility to protect the interests of their constituency - the present rather than future generations.	-1	-3	-1	-3	-2	-3
47	Problems that might arise decades from now are not important to me.	-4	-5	-4	-4	-4	-5
48	All states have a moral responsibility to contribute to a global climate solution.	4	3	5	2	3	3

49	The current generation (of politicians and voters) has a major ethical responsibility to future generations.	2	4	3	4	4	5
50	Future generations are likely to be richer and better off than we are, and better able to deal with climate change.	-2	-2	-1	-4	-3	-4
51	I fully support climate funding – financial flows from the rich to the poor to help them cope with climate change.	3	3	0	3	2	3
52	The rich countries have caused the problem; consequently they have the obligation to fix it.	-2	0	-1	1	4	2
53	Contemplating climate change usually leaves me feeling rather helpless.	-1	-2	-3	-1	-1	1
54	Climate change makes me fear for my children's future.	0	2	1	2	0	0
55	I believe that we will find a cooperative solution to climate change. Other issues have taken many years of negotiation, too.	1	1	3	1	1	0
56	Climate change is a very depressing issue.	0	0	0	0	0	2
57	Climate change is simply too complex and overwhelming. It is impossible to fully understand, let alone solve, the problem.	-1	-3	-3	-1	-4	-3
58	It is already too late to do anything about climate change.	-3	-4	-4	-4	-5	-3
59	There are moments when I lose all hope that the UNFCCC process can solve this problem.	1	1	0	0	0	2
60	Climate change scares me because I don't know what's going to happen.	-1	-1	-1	0	-1	0
61	Climate change is not the only issue we have to deal with and other issues are often more urgent.	1	-2	1	0	0	-2
62	The focus on winning the next election is the biggest obstacle to finding international agreement.	-1	1	1	-1	0	-1
63	I sometimes wonder how to explain our failure to fix the climate problem to my grandchildren.	0	-1	1	1	0	-1
64	I have a hard time imagining the consequences of climate change for my community and my country.	0	-1	-1	0	0	-1
65	Sometimes gradual processes such as GHG emissions result in sudden, dramatic changes in the environment. The existence of such climatic tipping points makes action even more urgent than previously thought. Avoiding tipping points should become a key climate policy goal.	2	5	2	2	1	2